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Electric Railway Journal

Volume 57

January to June, 1921

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Instructions for Use of Index

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, or to the state matters of any particular state. The geographical method of grouping serves to locate in the index any article descriptive of practices, conditions, events, etc., when the searcher knows the electric railway, city or state to which the article applies. Groupings are made under the name of the city in which the main office of the company is located, but an exception is made in the case of electrified sections of steam railroads, such entries being made direct under the name of the railroad. City or state affairs appear direct under the names of the city or state involved.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into thirteen general subjects, but the general subject headings, shown in capital letters, do not appear in the body of the index unless, like "employees," they appear also in small type. As an example of how to use the index, if a reader wishes to locate an article on special trackwork he would obviously look in the list under the general subject Track and under this caption, only special trackwork could apply to the article in question. The reader would therefore refer to this keyword under S in the body of the index.

In addition to the groups of articles covered by these headings the papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed. Short descriptions of machine tools appear only under the heading "Repair shop equipment" and are not indexed alphabetically, because of the fact that there is a wide choice in most cases of the proper keyword to be used.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION

Accidents (including wrecks)
Safety first

CARS AND OTHER VEHICLES

Car design
Cars
Locomotives
Motor buses
Motor cars, Gasoline
Motor trucks
Service and tower wagons
Trackless trolley
Work and wrecking cars

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Bearings
Brakes and compressors
Controllers and wiring
Couplers and bumpers
Current collection
Gears and pinions
Motors
Seats and windows
Trucks
Wheels

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Wages

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Accounting
Appraisal of railway property
Financial
Franchises
Insurance
Legal
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Market conditions
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Public service and regulative commissions
Service at cost
Statistics
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Insulating materials
Lubrication
Maintenance practice
Metals
Repair shop practice
Repair shops and equipment
Stores
Tests of materials and equipment
Welding

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Energy consumption
Fuel
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Power generation
Power stations and equipment
Substations and equipment
Switchboards and equipment

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Carhouses and storage yards
Power stations and equipment
Repair shops and equipment
Substations and equipment
Terminals
Waiting stations

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Ties
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Track maintenance

TRAFFIC AND TRANSPORTATION

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Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

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Happy New Year! Have Faith in Your Industry!

IT IS with very best wishes for the New Year that the ELECTRIC RAILWAY JOURNAL sends forth this first issue of 1921 dated Jan. 1, which will not happen again for six years, or in 1927. We wish a Happy New Year to the various companies and men associated with the companies and we see every reason to believe that the year will turn out to be a prosperous one. There is an undercurrent of optimism which cannot be mistaken. The railways are on the up grade and going strong.

In saying what we have we do not overlook the difficulties ahead, the problems to be solved. But difficulties and problems are always with us. Life would be monotonous if they were absent. It is merely that they are different ones in 1921 from those which have gone before and been long since overcome or solved successfully. We comment later on some specific present-day conditions. What we would emphasize here is that if there is one who is discouraged on account of present troubles as he sees them, if there is one in the railway industry who has lost faith in its future, let him give place to one whose faith and enthusiasm will allow him to conquer the problems which confront him. Optimism, ability and hard work will accomplish wonders. The electric railway industry is the industry which the men in it make it. If it is successful, they are to be thanked; if it suffers reverses, introspection is at least necessary to see if they are not responsible.

As we have said before, we have faith in the men of the industry. To those who doubt we would say:

Have faith in the industry—or get out!

Happy New Year!

Tendencies in Fares and Fare Collections

WE HOPE that during the coming year progress will be made in determining the best basis for fares and methods for their collection. The trend during the past year has undoubtedly been toward an increased flat fare, but the satisfaction given by the zone system where it has been tried, on about ten properties, shows that it also has claims for consideration. The most serious objection to its use remains in finding a convenient method of collecting the fare so as to prevent over-riding. Where with a flat fare tickets are sold at a reduced rate, the tendency is very clearly toward the use of metal tokens, and in all cases the fare box, either locked or registering, is growing in popularity.

In spite of reductions in the price of food and some other commodities, the time has not yet come when electric railway fares can be reduced. Labor and coal, the largest items in the operating expense account, are still as high as ever. Moreover, a great deal of rehabilitation will have to be done if the properties are to give the service which the people want, and they can be rehabilitated only if their credit is re-established by reasonable net earnings. Nevertheless, the time will come, if the country gets permanently on a less expensive scale of living, when fares will become less. Right here is a suggestion for the city where service at cost is being considered. In those cities which are on a service-at-cost basis this change will come about automatically and promptly without the necessity of extended hearings or any further readjustment of franchise relations, whereas this may not be the case in those localities where the company is permitted by franchise to charge a specified rate.

The experience of the past few years, hard as it has been, has had at least certain advantages to the railways. Not the least of these has been a general realization of factors in operating expenses which previously had been overlooked in many cases. This knowledge will be of value in any readjustment of fare necessary during the coming years. Railway companies now know that in order to keep their property intact they must consistently set aside from their earnings from 3½ to 4 per cent of the value of their renewable property each year as depreciation reserve. The lesson, though a dear one, may be worth all that it has cost.

Conduct Your Business as If You Had a Competitor

WE HOPE to see during the next twelve months more effort made toward merchandising transportation than ever before. Electric railway companies can no longer think that they can develop the maximum traffic possible on their lines simply by running cars. Necessity riding will come, it is true, without being sought, but this class of riding is small compared with that possible if a vigorous effort is made to obtain more.

The means for merchandising transportation are multifarious. They include many things which a large number of electric railway companies have already done and are doing every day, such as providing attractive cars, having them promptly at the points where they are needed, operating them at the speeds and over the routes desired by the majority of patrons, etc.; in other words, giving good service. Such a policy will win many passengers, just as the sale of reliable goods in a store will win many customers to the owner of that store, but few merchants would be satisfied with this as the sole inducement to attract buyers. Wide-awake merchants feel that they are not good salesmen if they do not strive continuously to impress upon the public the good quality and reasonableness in price of the goods they have for sale as well as the high grade of service to customers which they aim to provide.

Much of this effort on the part of the merchant undoubtedly comes because he realizes that he has competition in his business, and much of the lack of corresponding effort by the average railway man arises from the belief that he has no competition. This is the reason for the injunction at the head of these remarks, *i.e.*, "Conduct Your Business as If You Had a Competitor." Actually, of course, as the committee on merchandising transportation pointed out in its report at the last Atlantic City convention, every electric railway has competition of a very active kind. This comes not only from the public and private automobiles but, more important in most cases than either, from the sidewalk. The railway company must do as a merchant would do when he sees business which he wants going to a competitor. He studies the inducements offered by the competitor, the automobile or the sidewalk, and how many persons are patronizing them and how the company can best meet this competition with the service which it supplies.

This is what we hope the electric railway companies will do in increasing ratio during the coming year. We hope that each large company, and as many small companies as can do so, will add to its organization a "sales manager," whose chief duty will be to increase the sales of the company by every legitimate means. We expect to say more about the need of such an official in succeeding issues of this paper, but mention the point now because we consider it an important one. Such an official, as we visualize his duties, would have little to do with the details of the direct operation of the lines. His principal job would be to increase sales, though this would of course include advising the superintendent of transportation of the changes needed to make the service more popular.

Engineers Getting Together and Pushing Conservation

NEVER since engineering attained large proportions have engineers pulled together as they have during the past year or two. Undoubtedly the war helped to bring this about, but it is also the outcome of united effort, begun well before the war, to bring the engineer out of his shell and make him an influence in civic affairs. The engineers are numerous enough and well enough trained to warrant them in exerting a potent influence in the affairs of the country. They are beginning to realize this, and during 1920 they effected a federation of their national societies so that they can function as a unit when such functioning is desirable.

The engineers are getting together in other ways also. They are breaking down the barriers which have separated them into distinctive groups of civil, mechanical, railroad, marine and a hundred other types of engineers and are holding joint meetings for the discussion of topics of joint or general interest. This is noticeable in the gatherings of the sections of the national associations, which seemingly in most cases are now joint meetings. This is in the direction of economy of time and the promotion of fraternal feeling.

A large part of the thought of engineers is now being given to conservation. As a people we are extremely wasteful of our resources. We have so much that we have little incentive to save. There is only one factor that we, speaking for our country as a whole, understand, namely, high prices. When prices are high conservation is favored. Engineers are different from the rank and file of the people, however, for their profession is founded upon economy. An engineer is simply a person who builds or operates something more economically than other people. But the voice of the engineer has not been heard in the land nor in the Halls of Congress. It has been confined to his own circle, consisting of those who essentially agree with him. He has produced wonderful results in his special line and has laid the foundation for the prosperity of the country. And the country knows it. But as for influencing general conservation, that is another story.

It would not be fair to the engineering and scientific bureaus of the government, such as the Bureau of Mines, the Geological Survey and the Bureau of Standards, as well as the Departments of Commerce and the Interior, to give the impression that their efforts at conservation are not appreciated. This is far from the case. They are doing a great work. A remarkable example is the super-power survey now being made for the Department of the Interior by W. S. Murray. Here is an instance in which the power resources of the country's most congested industrial district are being comprehensively studied with a view to giving it a more economical and reliable supply of power. This is one of the achievements of 1920. The data for the report are now practically complete and the report will be ready within a few months. This super-power survey has enough of the spectacular in it to attract general attention, and at the same time it appears to be meeting with the approval of many of the power interests. Let us hope that the survey work will be fruitful in bringing about a saner use of our power resources.

This idea of conservation is behind a considerable number of engineering developments of large or small scope. It has given an impetus, for example, to the interest in using pulverized fuel in power plants. There has accumulated a vast store of fuel waste which was considered economically unreclaimable. In powdered form it now becomes available in competition with bituminous coal at present prices. Aside from the use of waste fuels, there is much interest in the pulverized firing of coal in competition with stokers. The whole matter was considered important enough by the American Electric Railway Engineering Association to cause it to be made the basis of a special report at the 1920 convention, and it will undoubtedly come up for discussion again from time to time.

In the line of conservation also, but conservation of labor and line material rather than fuel, is the automatic substation. This has made steady progress during the past year and the outlook for 1921 is promising. In fact, as finances permit, a general switching over to automatic control seems inevitable. There are still many technical problems in this field to be solved, but wonderful progress has been made.

One of the biggest fields for the engineer in the conservation movement is in heavy traction. On account of the unsettled state of our railroads during and since the war they have not been able to give the subject much attention, but they must do so soon. In the meantime Europe and other foreign sections are going ahead, impelled by the critical fuel situation and the prevalence of water power in many parts. The situation abroad is covered rather fully in an article elsewhere in this issue.

Finally, we must not forget the slogan "Do it mechanically." In spite of the excellent progress made in the development of tools for indoor and outdoor work, much more can be done. As R. C. Cram says in his review of the track situation in this issue, there are certain operations in that field that have resisted effort to substitute machinery for hand labor. The same is true in other departments. There is need for good engineering at this point.

A Financial Program for 1921

THE electric railway industry today, backed by the reports of the Federal Electric Railways Commission and of the public utilities committee of the Chamber of Commerce of the United States as being an essential industry, still finds itself with financial problems of no mean magnitude ahead. It is reassuring, however, to see, in the face of the great industrial depression of the past few weeks, the continued usefulness of the railways, as evidenced by the traffic, and also the apparent success which the industry as a whole has eventually had in gaining fares which are at least commensurate with the cost of rendering service. But the test of the success will probably come in 1921, for there is now to be considered more than the immediate problem of merely paying the cost of service, which has been the chief trouble in the past four or five years. We refer by this to the problems of really stabilizing the finances of the industry, of refinancing many railway security issues and of taking care of deficiencies in earnings and in maintenance and, in many cases, of actual depletion of property which have occurred during this period, as is so well analyzed by L. S. Storrs in this issue.

"Restoration of credit" is a phrase worn almost threadbare in the railway industry today. "Educate the Public" is in the same category, though we certainly urge no cessation of effort in response to either of these sayings. But we must examine what the industry, as an industry, can do; what can railway managements and directorates do?

We suggest a careful study of that part of the interview with President Gadsden, printed in this issue, in which he recommends a financial program for the industry. There are many men in the industry who agree with his recommendations as to simplification of financial structures, and we see every reason to support these suggestions. We refer to a recasting of the financial structure so that the total amount of capital securities issued, expressed in terms of par value, equals the value of the property. It must be realized, as some in financial circles and in positions to have an influence in formulating the policies of the companies have not yet fully realized, that the electric railway is a public utility, regulated by the public, and that therefore the financial structures necessary and desirable in the early days of the industry, and probably still necessary and desirable in private and unregulated competitive business, may not now be the best to have in this industry.

A reference to the statistics on receiverships and foreclosures which are given elsewhere in this issue will show two things, as pointed out in the introductory remarks preceding the tables: First, that there have been fewer receiverships in 1920 than might have been expected in the race to overtake expenses with income, and that the total money involved is relatively small; and, second, that most of the receiverships which have ended in 1920 have ended through more or less drastic financial reorganizations or else through complete abandonment or junking of the property. It is both pertinent and wise to consider at this time, too, that there are several companies not in receivers' hands and not under foreclosure which are, however, in default of some payments of fixed charges which are more or less serious. This list has its encouraging feature in the indication that security holders see conditions growing better and prefer to let the companies regain their stability without outside interference, and we believe this to be a legitimate attitude. But the situation as a whole today, while showing every indication of returning to a healthy condition, is thus shown to be one with its dangers. The year 1921, some have said, is crucial.

What is needed to meet unprecedented conditions are unprecedented methods, methods certainly which are based on fundamental economics, and also which recognize the human factor, the psychology and knowledge of the public served. The power lies with the directors of the various companies. The managements, who are closer to public opinion and whose whole energy, attention and devotion are centered in the individual properties, in contrast to the average director, who is interested in many properties and is forced to look chiefly at the financial statement for his knowledge of any individual property, must have the courage to bring constructive measures to the attention of their boards.

We are glad that "Electric Railway Financing" is to be the topic at the mid-year conference of the association. It is to be hoped that, as a result of the discussion at Chicago, definite measures will be outlined for railway men themselves to do toward restoration of electric railway credit.

Constructive Legislation Should Be a Feature of 1921

IT IS with more interest than usual that we approach the legislative season of 1921, when some forty Legislatures out of the forty-eight will be in session and when also the National Congress is busy with a legislative program that is all but staggering. From the standpoint of public utilities, and especially from the standpoint of electric railways, more intelligent legislation than ever before should be expected.

Past years have seen too much of popularly encouraged anti-utility or utility-restrictive legislation. They have also seen too many legitimate and constructive pieces of legislation affecting utilities fail to gain public approval, being passed without a general education of the public, although with full and open discussion in the legislative chambers. This year the people have before them the results of two complete and unbiased investigations of the electric railway industry. No industry has ever before been subjected to such analytical scrutiny or had the opportunity to benefit from the results thereof. It is, therefore, with a feeling that the public and the legislators are both better informed than heretofore that the legislative season is approached with optimism. If the public is not so familiar with some facts as we would wish we have largely ourselves to blame.

Another aspect of this situation is that in many states constructive utility legislation is an avowed purpose of incoming administrations and of reconvening legislatures. Unfortunately this is not universally true: in some states the utilities are still the football of politics. But, by and large, there is a desire to remove such restrictions and make such advances in legislative enactment as may be necessary to encourage utility development to meet the needs of the communities.

There will doubtless be some attention paid to the laws governing public utility commissions. Some of these have come under legislative fire for the first time because they have been courageous enough to do their duty in the face of shortsighted public opinion and demagogic political pressure. It is to be sincerely hoped that any and all legislation in this line will be of a nature to strengthen the commissions and to raise them to a position where they can more than ever command public esteem and confidence.

Electric railway men have their own work to do in this legislative program. Better than any others they know what is required and what is good or bad. Is it not the more bold and courageous thing to do to assist openly in formulating constructive legislation which will react in the development of better public service and at the same time better public confidence?

Labor and Wages During 1921

WITH the cost of living promising to be less during the coming twelve months and with unemployment in other industries increasing, the wage question for electric railways must be fairly met during 1921. According to statistics compiled by Professor Richey from a number of street railways there has been an average increase of 25 per cent during the year which has passed in the hourly street railway wages paid in the section east of the Mississippi River. Based on an index figure of 100 for 1913, the figure in December, 1919, was 186 and in December, 1920, it was 232. The peak was reached in September, 1920, when the December figure of 232 was attained. While the compilation is based largely, as we understand it, upon city properties, the figures probably are not very far from being representative of the industry as a whole, though to get the average wages per hour an allowance would have to be made for the way in which the wages were loaded; that is, the allowances made for overtime, making out reports, etc.

In changing their wage schedules it is obvious that electric railway companies cannot follow the course open to manufacturers when operation ceases to be profitable, namely, to shut down for a week or a month, then re-engage a staff. We believe, however, that when the proper time comes for a readjustment the men as a whole will meet the companies in the matter of wages in a broadminded way, recognizing its reason in lower living costs. But we also want to point out very distinctly that lower labor costs may be obtained in other ways than by reducing the maximum rate per hour.

One of these ways is to modify the loadings on the wage scale to which reference has already been made. Another method is to extend the period before the highest rate is paid. We believe the present period of one or two years, as established by the War Labor Board, is entirely too short, both as a matter of justice to the men and as a rating for efficiency in operation. It often takes a year or more for a man really to decide whether he likes the railway business and is fitted for it. It is hardly fair for such a man and for the man who takes up railroading as a stop gap between other lines of work when his own trade is dull to be able within a year or two to be put on a par, as to wages, with the men of longer training. Five years is a fairer period. A man who has worked that time with satisfaction to himself and to the company may be regarded practically as a fixture, and such a man is worth more to the company.

More extended use of the one-man car offers another means of maintaining high wages, while reducing operating expenses. The opposition of organized labor to this car is growing less, if we take as a criterion the acceptance by the men of the Eastern Massachusetts Street Railway of the decision in favor of these cars rendered on Nov. 8 by the Massachusetts Department of Public Utilities. In this connection it is well for any wage schedule to define the usual bonus for one-man car operation in percentage of the basic scale rather than in cents per car-hour, so as to simplify such changes as may be necessary from time to time by making them refer directly to the basic rates.

We see also in the coming year a better grade of employee seeking engagement in electric railway work. In the past, before the hectic period in industrial production during the war, electric railway employment appealed to men who wanted continuous service, in season and out of season, and who were not afraid to work. During the war, many good railway employees left because of the high wages paid in other industries. But those who stayed on now realize that theirs was the wiser course. Steady work at regular pay is far better in the long run than a somewhat higher hourly rate in a job which may stop any day, and no one realizes this more now than the motormen and conductors who have stuck to their positions during the past few years.

The Interurbans Require Greater Attention

INTERURBAN development has been practically at a standstill during the year just closed. The reason for this situation is of course the inability of the companies to finance new capital issues. Despite further fare increases during the year on a great many interurban properties, advances in operating expenses have nearly kept pace with them, so that the year is closing with little financial improvement over that prevailing Jan. 1, 1920.

To this general condition the competition of the private automobile, the motor bus and motor truck have contributed an increasing pressure. While we thoroughly doubt the likelihood of the motor bus or motor truck supplanting the electric interurban in any far-reaching way, yet the immediate effect is serious, for the advent of this new, much advertised, much overrated form of transportation has brought a formidable doubt into the mind of the investor as to whether his money may be invested safely and wisely in the electric interurban. This, then, would seem to be a temporary condition which may be remedied as time affords experience on what the limitations of the automotive vehicles are, on how better to meet this competition and on how to "sell" electric interurban transportation.

We feel that these things indicate that the interurban situation is more difficult than has been generally realized, judging from the scant attention given during the year to exclusively interurban problems. Little effort has been devoted to detail and searching studies looking to the betterment of operating practices and coincident economy. Hence we feel that the year 1921 must see more attention given to the interurban problems in association activities and in the thinking of the industry generally.

Looking into 1921, it seems to us that certain desirable lines of activity are apparent from an analysis of conditions that prevailed in 1920. The new year should be made to bring changes—changes looking toward improved earnings and decreased expenses. For example, there is opportunity for great improvement in the system of fare collection, judging by the experience of the several companies that have installed a zone check system of identifying passengers and checking turn-in. There is much to be done in the way of schedule revision to make the service more nearly fit the traffic available. This applies to both freight and passenger service and implies in one case the substitution of every-other-day instead of every-day shipment of l.c.l. matter from way stations where there is not adequate business to justify the handling of a car a day for that station, and in the other case, the arrangement of departure time of cars to fit traffic, without regard to the position of the hands of the clock. There is much saving to be accomplished by the application of energy saving devices which in most cases can be counted upon to finance themselves through the savings made at the coal pile. There is also a splendid opportunity to apply principles of merchandising to the sale of interurban transportation.

Again, there is the possibility of increasing fares. On some properties a further increase is justified and could wisely be asked and inaugurated. However, on many others, if one is to judge by the experience the steam roads are now having with traffic dropping off, undoubtedly due in large part (at least as far as the non-necessity riders are concerned) to the heavy fare increase, it may be well to be very cautious about increasing fares above the present level.

All these suggestions thus far may be put into practice without requiring new money. There are many other things that can be done to great advantage if the general condition of the money market and position of the individual company is such as to make possible the necessary financing. For example, a further standardization of equipment and provision of other facilities for an expansion of interchange service between properties offer a field for increasing earnings, particularly in the Middle West. This would improve passenger traffic and open the way for a very substantial increase in the amount of high-rate package freight carried. Even if it is impractical to undertake the handling of carload freight in a large way there is an enormous amount of this l.c.l. business which the interurbans can secure by virtue of superior service. In case after case it is lack of facilities to handle the volume of business that would be offered, that is turning this business to the steam roads and more recently to the motor truck companies. And the latter are likely to develop into formidable competitors unless the electric railways go after this business in a big way and expand facilities to handle it in a big way. In this connection, there is also the possibility of employing motor trucks as feeders of l.c.l. business to the interurban line, the railway company either owning such truck lines or co-operating with separate companies owning them.

One of the projects that would be of enormous value to most interurban lines is the building of new entrances into large terminals to avoid running over public streets. Unfortunately this usually involves enormous capital expenditures, yet there are two or three cases where such a project is awaiting only more favorable material and labor prices. High-speed service has produced a marked increase in passenger traffic on one important road. This service was anticipated by improvements to roadbed and the purchase of cars. Another and very important economy of which advantage may be taken is that afforded by the automatic substation. The labor saving, power saving and better voltage regulation made possible warrant serious consideration being given this means of reducing the cost of energy.

As to the outlook for the building of new interurban lines, it is entirely possible that the expected reduction in material and labor costs will start a number of new projects. The proposed line between Dallas and Wichita Falls, Tex., is practically assured under improved general economic conditions. There are also a number of other lines proposed in the Middle West as substantial extensions to present systems which may be expected to materialize with return of conditions more favorable to such work. It is also a fact that serious consideration will be and should be given to the use of the motor bus in many locations needing new transportation lines. For it is in matter of first cost that the motor bus line has its principal advantage over the electric interurban. The possibility of expanding present systems by this means can well be studied by interurban managements, which will thus co-ordinate the motor bus with the railway rather than permit it to become a competitor.

From these various aspects it seems that the year 1921 should be a very active one in the interurban field, particularly so because of the many things within reach to be done and the inactivity of the past year.

Annual Statistical Compilations Show Improved Conditions During 1920

IN THIS issue will be found the annual compilations showing in detail all new rolling stock ordered, track extensions, track reconstructed or rebuilt, together with comparative figures for the past ten years. There are also tables showing track abandoned and ripped up as well as track on which service has been entirely suspended without removing the track.

It appears from the summaries of cars ordered that conditions in the industry are somewhat better than a year ago inasmuch as the number of cars ordered is approximately 50 per cent greater than in 1919. The same conclusions can be reached from the table of companies that have gone into the hands of receivers during 1920. The number is materially less than in the previous year and the amount of securities is likewise smaller inasmuch as the number of large companies involved is less.

Taken as a whole, conditions seem to be somewhat improved for the manufacturer. This is no doubt due to the results of the several fare increases which are gradually restoring the purchasing power of railways to about the condition that should have existed during the war period. With the decrease now impending in the cost of supplies and the better conditions existing in the labor market an optimistic view is taken that 1921 purchases should exceed those of the past year.

Quotation from the Federal Electric Railways Commission Report

No. 1

THE electric railway furnishing transportation upon rails is an essential public utility and should have the sympathetic understanding and co-operation of the public if it is to continue to perform a useful public service.

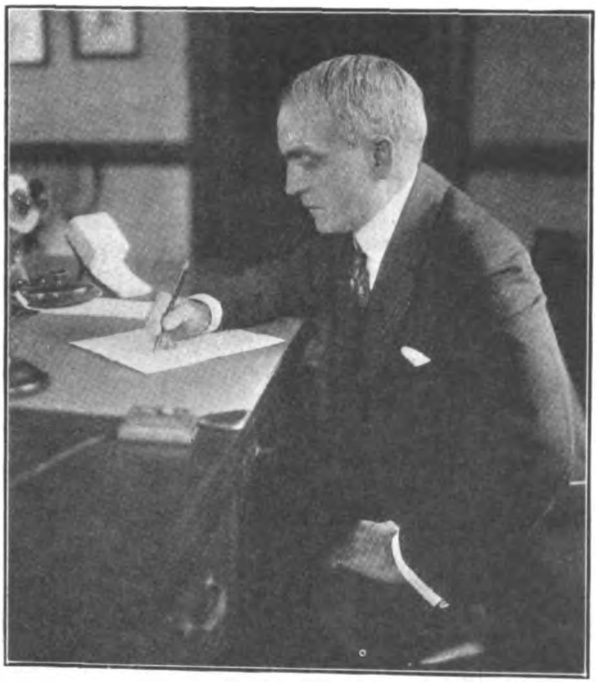
The experience of seventy-five years, the unanimous opinion of expert witnesses, and of those who are students of transportation problems, and the assumption of the necessity for tracks by inventors working to improve the methods of street transportation alike demonstrate the fundamental and permanently essential nature of the railway—and to the present time of the electric railway—as the most nearly adequate, reliable and satisfactory system available for transporting the maximum number of people through the streets of our cities with the least interference with the use of these streets for other purposes of public ways.

Ask the Car Rider

President Gadsden Says the Outstanding Problems of the Industry Must Be Eventually Answered to Satisfy the Car Rider—The Uppermost Problem of the Industry Is to Rectify the Credit of the Railways—This Is an Inside Problem with the Public Co-operating—There Is No Time Like the Present to Do Whatever Housecleaning Is Necessary in the Industry

By Harold V. Bozell

“‘ASK the car rider.’ How would that do for a slogan to test the answer as to what to do in the various problems facing the electric railway?” said Philip H. Gadsden, president of the American Electric Railway Association, as he was discussing the outstanding problems confronting the industry and what the industry itself could do to solve these problems.



PHILIP H. GADSDEN
President American Electric Railway Association

Mr. Gadsden was sitting at his desk in the United Gas Improvement Company Building in Philadelphia, where he directs the public relations work of a large group of public utilities. And good public relations are uppermost in his mind as the real rock bottom solution of most public utility problems of the day.

He is a straight and fearless thinker—and doer—this new president of the association. He is wrapped up in his work and is fully conscious of both the responsibilities and the opportunities of his new position as representative head of one of the country's greatest industries. He is anxious to do what he can to effect progress in the electric railway business and he tries clearly to outline the difficulties ahead. One is impressed with his desire to face all problems and facts as they are and not to dodge an issue because it may be unpleasant or distasteful. He had a great opportunity to test public and group opinion when he served on the Federal Electric Railways Commission, which he was instrumental in forming and for which the industry owes him its gratitude, and he is acting with that experience as a background.

He wants the railways to win public confidence, which after all is the basis of the credit so badly needed.

It is a pleasure to talk to him and gain his inspiration.

“The car rider will usually have the correct answer, in simple language, to many questions which confront us,” he continued. “Ask the car rider, for instance, if he wants to pay for paving between the tracks. Ask the car rider what sort of service he wants, and if he is willing to pay for it. It really is a pretty good test of our own conclusions to try to predict what the car rider's answer will be to most of the problems confronting the industry today.”

“What do you consider the uppermost problem of the industry to be, Mr. Gadsden? What are the things which the industry itself can do so that it may better perform its functions?”

“Restoration of credit is, of course, the uppermost problem that we have in front of us today. We must approach this problem squarely. It appears now that the work of getting a recognition by electric railway men themselves of the part the industry itself must play in this restoration of credit will prove to be even harder than the restoration of credit once the recognition is given. But the men in the industry must realize, 100 per cent, that it is largely an inside problem.

“Electric railway men must recognize that they and they primarily have to do whatever necessity demands in order to rectify this credit situation. Much of what has to be done may not be liked by some people, but this much is certain: It is absolutely essential that present investment be stabilized before it is possible to invite or induce new capital to come in and there are certain economic principles with which it is necessary to comply before this can be accomplished. Railway men must get down to brass tacks, study economics and the car rider's mind, and do the necessary things no matter how distasteful they may be.”

“You regard it as an internal problem then, and not one to be passed on to the public?”

“Yes.”

“Have you any suggestions as to the actual road which the industry must travel in order to restore this credit?”

THE INDUSTRY SHOULD ANNOUNCE ITS STAND

“For one thing, it must be recognized that not only is it an internal problem but that it is a problem for the industry, *as an industry*, to do. There is such an interrelation existing between the various electric railway properties that it is not a problem for individual action here and there over the country, but it is a problem for the industry as a whole, in so far as general principles are concerned.

“The program which I favor very much would be to have the industry state in a formal way, make a public announcement, that it accepts in principle the report of the Federal Electric Railways Commission and also the report of the public utilities committee of the United States Chamber of Commerce.

"The industry should announce that it recognizes the principles laid down in these reports as voicing the best informed opinion of the public as in the interests of restoring the credit of the industry. The people, through two disinterested bodies, have expressed their conclusions and they deserve, and will demand, to know where the railways stand.

"I think this would be an excellent move for the American Electric Railway Association to make. As representing the industry as a whole, the association could make the announcement mentioned above and say that the railways of the country are prepared to go along that line of action if the public itself is willing to do likewise.

"Naturally, each locality has its special problems and must work out the details of the case in view of the particular conditions surrounding that case. But, broadly considered, it is a problem for the whole industry, and the industry must be treated as a whole. I repeat that it must not be forgotten that each and every electric railway suffers from the wrongdoings and mistakes or weaknesses of other railways and investors quite generally refuse to put their money in particular railways until the stability of the whole field has been established. From this line of argument I draw my conclusion that we must do it as an industry, and probably through the association as the mouthpiece of the industry. Therefore, it will be very helpful if the association itself would come out with a formal statement along these lines."

"Wasn't a great opportunity, psychologically, just passed at the convention at Atlantic City, when such an action might well have been taken? It would have been a dramatic move, surely."

"Personally, I think that is true. Some of my best friends disagree with it, but that merely emphasizes what I said before that one problem which we must work out within the industry by ourselves is to gain an appreciation of our own opportunities and duties in this connection, to realize that it is our own problem and that we must, as an industry, state the platform on which we stand."

"How can the industry now best place this report before the public, and incidentally before itself?"

"The association's publicity committee is working on that now, and I have some ideas which we are formulating and which contemplate playing up in brief form and in some attractive way the conclusions and outstanding points in the analysis of the Federal Electric Railways Commission report and having this widely distributed over the country in railway offices, on car cards, and for use in various publications. We must use every means, of course. The details will be worked out by the committee."

"Mr. Gadsden, you have mentioned from time to time the suggestion that it would be wise for electric railways to modify their financial structures in such a way that the capitalization equals the officially approved or determined valuation. Won't you state your views on this concretely, and indicate how it would help solve this credit situation?"

"To answer that, let me first call attention to some provisions of any service-at-cost arrangement from whose study we may profit. You know I favor that form of contract. Now, to my mind there are two features to 'service at cost' from the standpoint of the restoration of credit. These are: First, that there is an official valuation of the property; and, second, a readjustment of securities of the property to conform to the valuation so found. This is an essential under such a form of contract, for as a rule these contracts guarantee a certain fixed dividend on outstanding stock. The limited experience which we have had with 'service at cost' tends strongly to show that this process has been largely instrumental in restoring public confidence in securities so readjusted, and to show further, and this, to my mind, is the greatest result, that there has been a building up of a local market for the kind of securities mentioned.

OPPORTUNITY FOR EXECUTIVE FORESIGHT

"If this is a correct statement of facts it seems very clear that the nearer the electric railways as an industry can conform their own financial set-ups to those principles the greater chance will they have of restoring the credit of the industry and building up a local demand for traction securities.

"Of course all of us realize the many difficulties in the way of bringing this about, but my own judgment is that the railway executive who is far-seeing enough to realize this situation and take advantage of it is going to place his property in a much more wholesome and healthy condition than one who does not.

"Certainly the electric railways today have nothing to fear from fair valuation of their property. Taking whatever basis of determining fair value is finally agreed upon, it is impossible to make a valuation without recognizing the real intrinsic worth of the public utility and of arriving at a valuation which is fair to all concerned. We all know that in many cases the value, when found, equals and sometimes exceeds the capitalization. But whether it does or not, I believe the principle is a sound one to follow. The car rider can understand it, for one thing.

"There are many good men in the industry who do not agree with this viewpoint, but from the contact with all sorts of opinions which it was possible for me to gain in my experience on the Federal Electric Railways Commission I am thoroughly convinced that this would be a most healthy program for the railways to follow. It is one of the things which the railways themselves can do, and which if forced upon them from the outside will react only to the great detriment of electric railways in the further destruction of electric railway credit.

"With reference to the necessary new capital required from year to year to provide the extensions of the railway facilities demanded by the growth of our various communities, I think it ought to be impressed upon the public that unless the conditions and restrictions now imposed upon us, and which are largely responsible for our present want of credit, are removed there is very great danger that whether the American public wants it or not the electric railways will be forced into the hands of municipalities, for the reason that if conditions are such that private capital will not go back into the industry public credit must. The issue to my mind, therefore, is squarely made:

> **"If the American public, as there can be no doubt, are opposed to the municipalization of their public utilities, and especially of their traction systems, it is incumbent upon them to co-operate with the railway executives in doing whatever must be done to make investment in electric railway securities attractive to the private investor. We have been talking about steps which should be taken by railway executives to restore the confidence of the public. This is one thing which the public, it seems to me, can and must do.**

"What do you think of the application or the use of non-par value stock as an answer to the problem of restoring the credit or stabilizing the finances of the electric railway industry today?"

"I think it offers a very satisfactory and equitable solution of a most difficult and vexing problem. Stock is, of course, nothing more nor less than a right to share in the earnings of a company, and it appears to me that our corporate industries, and certainly our public utilities, would be in much better shape if the stock were issued on a non-par value basis. Every one is fully protected; the return is allowed upon the actual property in the service of the public; the fixed charges of interest on bonds, which would of necessity be conservatively floated, would be recognized by all and the non-par value stock would gain its earnings in proportion to the service rendered by the electric railway and the efficiency with which that service was rendered.

"In this discussion I wish it to be understood that I am convinced that the question of bonus stock or so-called overcapitalization has been greatly exaggerated in the public mind and that whatever bonus stock was issued was necessary in the promotion days. That does not eliminate, however, the vulnerable feature today, and we should recognize that fact.

"There are two ways of strengthening the basic financial structure. One of these is to adjust the securities until their par value equals the valuation of the property, and the other, and I believe much more preferable way, is to change to non-par value stock.

"I am very hopeful that the industry will face this problem squarely, realizing that it is an internal problem, and that the financial structures of the various companies will be made simple enough for the car riders to understand. Understand me, I favor no change in the total return on account of any shift in par value; that is determined by the actual valuation of the property. I am not criticising, but rather upholding, the corporate organizations and financial structures as they have had to be built in the past. But to meet present-day conditions and present-day public policy some change is desirable in the capital structure of some of our companies."

"There is another question which seems to be preying upon the minds of the public in many places, and that is the one of underlying leases. It has been used by political demagogues so often that a discussion of it is pertinent, at least."

"That, it appears to me, is merely another question of inside-the-house cleaning. The public isn't interested at all fundamentally in what our arrangements are with each other, so long as it realizes that all it is paying is a fair return on the fair valuation. But I think we must realize that the time has come when the public will insist upon paying only a fair return on a fair valuation and that we must make our own arrangements with each other, so that we can exist individually and collectively on that basis. Naturally, fixed leases made a good many years ago are points of attack for politicians, whether they have any effect on the actual rate of fare paid by the car rider or not, but what the car rider will insist upon is that they do not have any such effect. His attitude is: 'What's your total property worth? What does my ride cost, with a fair profit to you? Eight cents? Ten cents? Well, take my dime and divide it any way you want to.'"

"To refer again to the service-at-cost franchise principle which you mentioned, its adoption was one of the recommendations of the Federal Electric Railways Commission, was it not?"

SERVICE-AT-COST ADVANTAGES

"Yes, it was suggested as a fair solution, and I see many advantages to that form of contract. There are places, of course, where difficulties have been found with the particular form of contract made and none of the service-at-cost franchises is perfect in providing a real incentive to management. That problem must yet be worked out. But at bottom there is real incentive to the owners.

"I think the following is a fair statement: capital is fluid, in other words, it flows to attractive conditions, and if the cost of money is, say, 8 per cent and this is sufficiently protected in the terms of a service-at-cost franchise and backed by public opinion, there should really be no necessary added incentive to induce capital to go into an electric railway operating under such a franchise. Service-at-cost franchises recognize that the electric railway business is an investment business and not a speculative business any longer. But I do think there should be some incentive to better management and I am hopeful that there will be a real way found to include this satisfactorily in such transactions in the future.

"Still, as to management, it appears to me that there should be no reason to doubt that there will be good service. Just consider the general manager; his professional reputation rests upon the results he obtains; he is compared with managers in other communities; a certain morale is thus created which is worth more than any monetary reward.

> **"As a matter of fact, I believe that the morale in public utility business is extraordinarily high, and in the electric railway business this is specially true. I often compare it to the morale of a good military force. Certainly during the past trying years electric railway managements have measured up to the highest standard of public duty.**

"But I must admit that a solution satisfactory to all with reference to the proper recognition of good management under service-at-cost franchises has not yet been found."

"There are two other points of interest to railways today, Mr. Gadsden, that it would be profitable to have you say a word on if you will. These are labor conditions and the place of the motor bus. One question with reference to the former is the wage scale. Certain cuts in wages have already been made in other industries and what is the future on the railways?"

"Well, we must first recognize that we can't expect to lower the wage scale until a reduction in living costs has become a fact—so that the electric railway man on any new scale can live as well as he can now. In other words, the method of determination of satisfactory wages will be somewhat on the basis of their determination during the war when living conditions were taken into account.

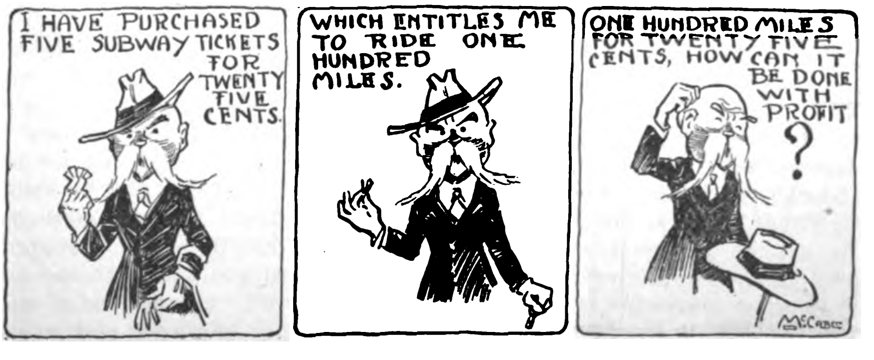
"With reference to the cuts which have been made in other industries, I interpret this as meaning that labor in industries which are not public utilities prefer to work at a partly reduced compensation rather than to run the risk of having the industry close down entirely. We must recognize the fact that public utility labor does not have this fear, for it knows it is in a business which must continue to run and it would fight reductions to the limit.

WAGE SCALES AND COLLECTIVE BARGAINING

"I do see a way in the future, however, when living conditions have lowered sufficiently to make it possible for railways to get help at lower wages, and this is already beginning to be the case; what I have in mind is to make no change in the agreement with the men now on the railways, but to take on new men at lower rates, leaving the higher rates for men of long service and greater ability. I notice that the ELECTRIC RAILWAY JOURNAL has proposed this plan editorially as a solution, and I think it is a wise one. I think it is a solution which should appeal to labor as well as to the railways as the easiest means of going back down the scale as the general price level recedes."

"And as to organized labor or the open shop?"

"Well, all I can do is to give my opinion as a result of my own individual experiences, but I think there is no doubt of the fact that every one recognizes the right of labor to organize today or, expressed in another way, the right of collective bargaining. If that is the case, and the men on a given property decide to get together, I believe there is greater harmony and unquestionably greater efficiency, as a matter of practice, if the men all go in or all stay out. In other words, let the representatives of the men represent all the men rather than having various groups continually coming to the management. The men are better in one organization and not broken into groups. This is another inside-the-family arrangement, with the family in this case in the rank and file of the men themselves. But managers and executives of properties should reserve the right in the first instance to engage men either in an organization or out of it.


I HAVE PURCHASED FIVE SUBWAY TICKETS FOR TWENTY FIVE CENTS.
WHICH ENTITLES ME TO RIDE ONE HUNDRED MILES.
ONE HUNDRED MILES FOR TWENTY FIVE CENTS, HOW CAN IT BE DONE WITH PROFIT ?
McCabe

HOW McCABE HAS PICTURED HIS CAR RIDER CHARACTER, "THE COLONEL" WITH A QUESTION HE CAN'T ANSWER

"One of the points emphasized by the commission in its report is the necessity of working out some plan by which harmonious relations can be maintained between the managements and the men, and strikes thereby avoided, as one of the essentials to the restoration of the credit of the industry. I think we cannot emphasize the point too strongly. The investor naturally hesitates to invest his money in an industry which is subject to recurring interruptions of service growing out of controversies, over either wages or service, between the management and the men.

"Therefore, in the highest interests of the property itself, a serious effort should be made to arrive at some satisfactory relation within the industry. But I feel that the details of the problem of how to work out relations between labor and management are for each individual property to work out to fit its conditions, though we may be able to arrive at some fundamental conceptions common to all."

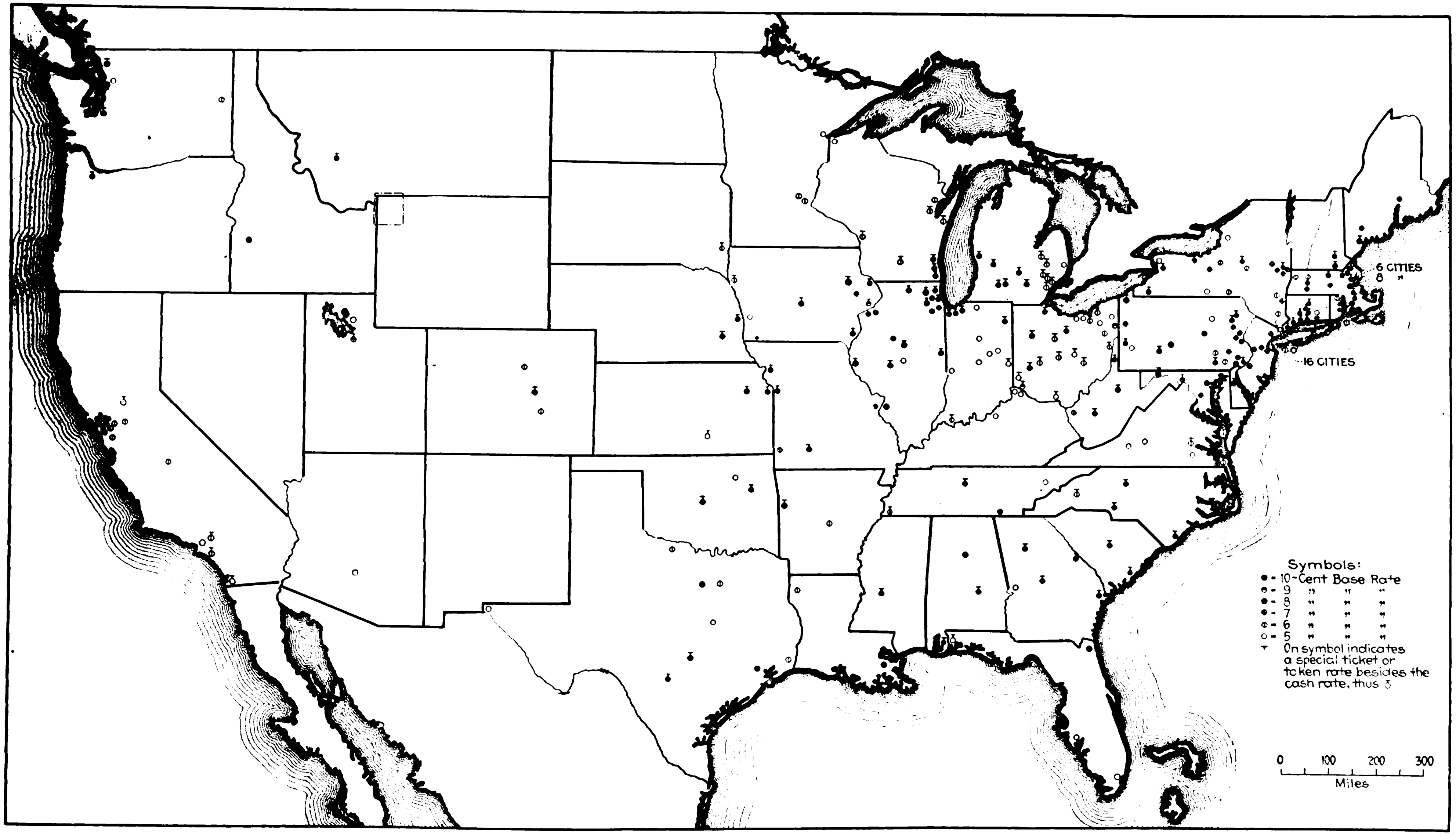
"And what of the railways and the motor bus?"

"I can't see any answer to this question except that the railways themselves must adopt and use the motor bus in its correct economic sphere. It may sometimes mean running motor buses at a loss, but it is better to run them at a small loss than to be forced to run cars on rails at a higher loss. The motor bus certainly has a field as a feeder, as an auxiliary service, and probably in the handling of peak loads where it does not pay to install extra trackage. Competition, unregulated or regulated, will bring no good to either system of transportation."

"You are optimistic as to the future?"

"One cannot study the electric railway situation and feel otherwise. As has been pointed out so many times, the electric railways are an absolute essential of community life. The testimony before the commission proved conclusively that their usefulness to their respective communities had increased rather than diminished, notwithstanding the extraordinary development of the automobile.

"As a rule, the electric railways have succeeded, at last, in securing rates of fare fairly commensurate with the service they are rendering. If we can succeed in maintaining these rates of fare, in the face of the prospect of a general decline in the cost of labor and material, the outlook for electric railways is very encouraging. While industry generally is slowing down, the experience of the past has shown that the business of the electric railways is affected but little by industrial depression. This in the past has made electric railway securities favorite investments on the part of the public, and, in my judgment, we are again approaching the period when our securities will be sought after by prudent careful investors."


6 CITIES
8 "
16 CITIES
Symbols:
● - 10-Cent Base Rate
- 9 " " "
- 8 " " "
- 7 " " "
- 6 " " "
○ - 5 " " "
On symbol indicates a special ticket or token rate besides the cash rate, thus 5
0 100 200 300
Miles

A Graphical Portrayal of the Electric Railway Fare Situation in the United States Today. Symbolic Representation of Base Fares in Use in Cities of 25,000 Population or Over. Zone Fares Are Not Differentiated

Our National Fare Experiment

How the Industry Has Tried to Meet the Problem of Continuing Adequate Service Without Imposing Burdensome Rates—Ever-Increasing Costs Have Kept One Lap Ahead of Fares—The Industry Has Delayed Fare Increases and Has Tried Zone Systems to Minimize Demands on Public's Pocketbook—Now that Fares Begin to Be Commensurate with Cost, Large Cumulative Deficit of Recent Years Is a Problem

By Lucius S. Storrs
President the Connecticut Company, New Haven, Conn.
Past-President American Electric Railway Association

DURING the past five or six years all industry has had to meet unforeseen and unprecedented conditions, as every one knows. Private business has met these conditions in various ways, but usually according to practices which were not different from its ordinary ones; that is, the usual law of competition and supply and demand was allowed to hold sway. Some business enterprises, which had never before been subjected to regulation, have had to conform to certain government restrictions and rules, and in some cases even to turn over operation, or at least direction, to government agencies.

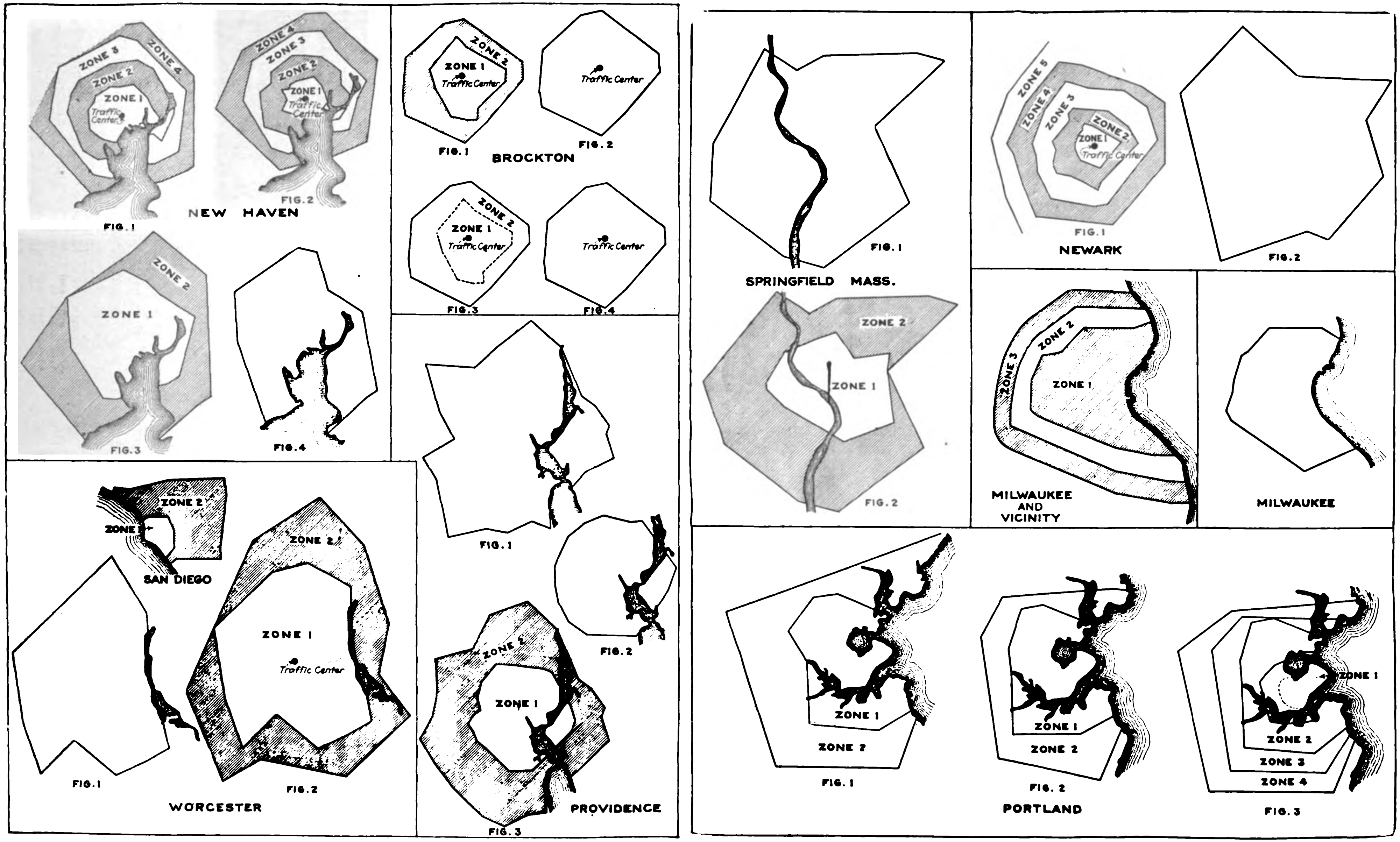
Through all this period the public utilities, and especially the electric railways, have had even more difficulty in keeping their business in successful operation. This statement, of course, is not novel either to electric railway men or to users of electric railway service. But in these new conditions there has been a continual struggle to keep properties alive and in operation, and the character of this struggle, viewed from the knowledge of today, appears to be a gigantic experiment in street railway fares from which the industry and the public may both learn some lessons. From this statement it is not to be inferred that the experiment is at an end and that final conclusions may be drawn, but rather that it is well to take stock of the fare development since 1914-15 to see where the industry is headed.

In this study there is no idea of duplicating the various fare studies and fare reports which have been made from time to time by the ELECTRIC RAILWAY JOURNAL and the American Electric Railway Association. Rather, it is the purpose to take a broad view of the subject as reflected by these various reports. Since 1914-15 the news columns of the ELECTRIC RAILWAY JOURNAL, for example, have carried item after item of "Fare Increase Sought," "Fare Increase Granted," "Six Cents in Smithville," "Seven Cents in Jamestown," "Another Increase Needed," "Eight Cents in Brownburg," "Ten-Cent Fare Granted in Jonesboro," and so on. From time to time the American Electric Railway Association has issued lists showing the fares in the leading cities. The last such list depicting the fare situation in all cities over 25,000 population, as of approximately five weeks ago, was published by the Association in *Aera* for December. This information, brought up to the date of this article, is shown graphically on an accompanying map of the United States, which has been prepared by the ELECTRIC RAILWAY JOURNAL. It gives a beautiful and telling story of the present fare situation in the country. Just a glance at the map indicates the variety of results which have been arrived at in this vast and nationwide experiment to solve the fare question. Practically every city indicated on the map has had a change in the unit rate of fare or fare system since 1914-15.

The premise upon which this article is based is that in 1914-15 there existed in this country throughout the electric railway industry a more or less standardized flat fare system of five cents for all urban rides. Usually free transfers were given—the so-called universal transfer system, in other words. Whether this was a situation which, upon complete and unbiased, social and scientific analysis, was the best that could be devised or was the most equitable to all interests involved need not enter into this discussion. There are some who believe that a distance tariff, such as is in vogue in many foreign countries, should have been in existence in this country at that time. There are some who believe that, even on a flat fare basis, it would have been possible to furnish transportation at less than 5 cents per passenger. But there are many operators who have had to furnish the service and many financial men who have tried to provide the wherewithal for proper growth of facilities who know or believe that, taken the United States over, the electric railway industry was not paying all expenses, making all necessary maintenance and depreciation charges and giving an adequate return to the capital which had made the industry possible on the 5-cent fare basis. Labor in the industry was admittedly, as viewed from facts now known, paid none too well. As has been stated by one public service commissioner, the public wanted a service at a price which demanded cheap labor and it got it.

But be these conditions as they were, debatable though they may be, the facts remain that at the beginning of the economic upheaval caused by the great war the electric railways of the country were operating and giving fair service, in many places wonderful service, for 5 cents. The story of constantly increasing costs in materials, of constant readjustments of labor contracts and of constantly rising costs of operation in general is not new. Nor is it giving any information to repeat the story of the continuous fare increases and adjustments with which every one is familiar in a hazy or general way. But, viewing the history of the whole industry from the knowledge of today, there is one fact that seems certain. As a nationwide average there has been a time lag of fare increases behind increases in operating costs which has caused a deficit to be created, and this deficit is one of the factors to be considered by railways and commissions in adjusting conditions of today and for the future.

But most important to note, from the standpoint of the public at least, and most gratifying to those who would have faith in the future of the industry, is to realize the attitude of those responsible for railway


ZONE 1
ZONE 2
ZONE 3
ZONE 4
Traffic Center
FIG. 1
FIG. 2
NEW HAVEN
ZONE 1
ZONE 2
FIG. 3
FIG. 4
ZONE 1
ZONE 2
Traffic Center
FIG. 1
FIG. 2
BROCKTON
ZONE 1
ZONE 2
Traffic Center
FIG. 3
FIG. 4
FIG. 1
SPRINGFIELD MASS.
ZONE 1
ZONE 2
FIG. 2
ZONE 1
ZONE 2
ZONE 3
ZONE 4
ZONE 5
Traffic Center
FIG. 1
NEWARK
FIG. 2
ZONE 1
ZONE 2
ZONE 3
MILWAUKEE AND VICINITY
MILWAUKEE
ZONE 1
ZONE 2
SAN DIEGO
ZONE 1
ZONE 2
Traffic Center
FIG. 1
FIG. 2
WORCESTER
FIG. 1
FIG. 2
ZONE 1
ZONE 2
FIG. 3
PROVIDENCE
ZONE 1
ZONE 2
FIG. 1
FIG. 2
ZONE 3
ZONE 4
FIG. 3
PORTLAND

Zonal Areas or Fare Limits Adopted by Various Cities in Changing Fare Systems

The population, zonal areas and present fare systems of the cities shown here are given at the bottom of the page facing this illustration. The fare history of each is given in the accompanying text.

(These maps are to the same scale as those on page 16) operation in this gradual increase in rates. To the writer's mind, the weighted national average situation shows that the railways have been most moderate in the fare increases requested. It is apparent that the following factors have been in the minds of railway men responsible: That the service must be kept up for the benefit of the public at all costs; that inescapable increases of costs were upon the railways; that whatever fare increases were necessary to meet these increases in costs should be as moderate as possible so that the public, which had to pay the bill, would be burdened as little as possible. As a result, the average situation has shown that the fare advance has been too moderate for the best interests of all; too moderate especially for the best interests of the public, as a matter of fact. To state it in other words, the average railway management has naturally desired to have income overtake outgo, but has made increases in fare barely adequate to make this possible, figured on the most favorable basis, and no sooner has the increase been put into effect than costs have taken another jump and the condition was as bad as before. Then, too, the anticipated falling off in riding has occurred in a greater or less degree, following fare increases. To say this in another way, every one realizes that 100 per cent of the riders will not ride at any increase in fare—some will walk or use other means, private or public, depending upon conditions.

As explained more in detail later on, the result of all this has been a partial, and sometimes complete, disregard of a return to the actual money invested in the various properties through non-payment of interest and dividends. In other words, the owners of the various properties have contributed the physical property itself to a continuous service to the public without any immediate return. It does not pay to refuse, ostrich like, to face the fact that a part of the public—the politicians in the lead—claim that this is only a fair repayment of the traditional excessive profits supposed to have been made by former promoters and owners of traction properties. The industry must make it known that today's owners have made this contribution to the continued service to the public, with a purpose which has been socially patriotic.

Two criticisms might be made of railway managements in this connection.

One of these is that the managements, realizing, as most of them must have done, that at the time of each increase of fare the increase in cost had not ended and that the fare increase would prove insufficient only too soon, have lacked the courage to present their cases for increases that would really be effective. From the standpoint of the public, as is known to be the case now, this would have been the better thing to do, for the railways would have been in a position to extend and develop the service which the public desired and demanded. The other possible criticism is that the railway managements did not have the salesmanship to gain the increases which they knew to be necessary. There is no doubt that the electric railway as an industry has not had a sales attitude, but rather a service and operating attitude.

It is more generous, however, and probably more nearly correct, to believe that the managements have, in each case, felt that they were doing the best thing to keep the fare increase at the lowest possible figure in the hope that the peak had been reached and that the property would be successful under the new rate.

In other industries increases were made by leaps and jumps of from 100 to 250 per cent in case after case. In only a few instances have electric railways taken the full jump at once from the former fare to a fare which was felt to be really adequate and effective.

To make plain the points which have been made above, it is believed worth while to mention the history of a few of the individual experiments which have been made. There have been two general sorts of attempts. One of these has been the gradual increase of flat fares, retaining the old limits, which were usually on the 5-cent basis. The other has been through the application of a distance tariff, under which the passenger pays for the actual distance of the ride, or through a lessening of the distance of the initial fare zone. Most of the latter experiments have been made in New England. The cases which are here quoted are selected at random, so to speak, and merely to show the various kinds and percentages of fare changes which have been made. There is no "typical" case which can be cited. They all differ.

Chicago, Ill.

In Chicago, where the company waited some time for its increase and where the situation was almost as complicated politically as it is in New York, the management did have the courage to ask at the first for a rate of fare which seemed to be fully commensurate with

DETAILED DATA TO ACCOMPANY ZONAL AREA DIAGRAMS ON PAGE 12

New Haven — Popu'ation 162,519*

Fig. 1	Area zone 1	4.66 sq. mi.	Present fare 10c. flat. Fig. 4. Commutation books for suburban riders for trips in 5 suburban zones or more from traffic centers are sold.
	Area zones 1 and 2	12.19 sq. mi.	
	Area zones 1 to 3	22.08 sq. mi.	
	Area zones 1 to 4	31.97 sq. mi.	
Fig. 2	Area zone 1	2.24 sq. mi.	
	Area zones 1 and 2	8.50 sq. mi.	
	Area zones 1 to 3	15.95 sq. mi.	
	Area zones 1 to 4	28.00 sq. mi.	
Fig. 3	Area zone 1	18.13 sq. mi.	
	Area zones 1 and 2	41.43 sq. mi.	
Fig. 4	Area	26.48 sq. mi.	

Brockton—Population 66,138

Fig. 1	Area zone 1	6.81 sq. mi.	Present fare 10c. cash, 14 tickets for $1 (To traffic center only).
	Area zones 1 and 2	18.27 sq. mi.	
Fig. 2	Area	18.27 sq. mi.	
Fig. 3	Area zone 1	6.81 sq. mi.	
	Area zones 1 and 2	18.27 sq. mi.	
Fig. 4	Area zone 1	18.27 sq. mi.	

Worcester — Population 179,754

Fig. 1	Area	39.54 sq. mi.	Present fare 7c. in city zone and 6c. in outside zones.
Fig. 2	Area zone 1	36.92 sq. mi.	
	Area zones 1 and 2	72.65 sq. mi.	

Providence — Population 237,595

Fig. 1	Area	44.00 sq. mi.	Present fare 6c. in each zone.
Fig. 2	Area	17.94 sq. mi.	
Fig. 3	Area zone 1	12.87 sq. mi.	
	Area zones 1 and 2	44.50 sq. mi.	

*Population figures are from the 1920 census report.

San Diego — Population 74,683

Fig. 1	Area zone 1	1.65 sq. mi.	5c. in each zone, 4 tickets for 30c., good in two zones.
	Area zones 1 and 2	12.50 sq. mi.	

Springfield — Population 129,563

Fig. 1	Area	58.71 sq. mi.	Present fare 7c. in each zone.
Fig. 2	Area zone 1	15.87 sq. mi.	
	Area zones 1 and 2	62.15 sq. mi.	

Newark — Population 414,216

Fig. 1	Area zone 1	2.38 sq. mi.	Present fare 7c. flat, 1c. transfer charge.
	Area zones 1 and 2	8.55 sq. mi.	
	Area zones 1 and 3	22.20 sq. mi.	
	Area zones 1 and 4	31.00 sq. mi.	
Fig. 2	Area	59.00 sq. mi.	

Milwaukee — Population 457,147

Milwaukee and vicinity:			Present fare 7c. in zone 1, 8 tickets for 50c., 3c. in outer zones.
	Area zone 1	26.00 sq. mi.	
	Area zones 1 and 2	42.00 sq. mi.	
	Area zones 1 and 3	62.00 sq. mi.	
Milwaukee alone:			
	Area	25.40 sq. mi.	

Portland — Population 69,272

Fig. 1	Area zone 1	17.00 sq. mi.	Present fare 10c. cash or 8c. ticket, for ride through 3 zones or less.
	Area zones 1 and 2	49.98 sq. mi.	
Fig. 2	Area zone 1	15.23 sq. mi.	
	Area zones 1 and 2	32.32 sq. mi.	
Fig. 3	Area zone 1	4.19 sq. mi.	
	Area zones 1 and 2	15.91 sq. mi.	
	Area zones 1 and 3	26.62 sq. mi.	
	Area zones 1 and 4	49.94 sq. mi.	

cost. This was later cut down by the commission, but soon increased to the present fare of 8 cents on the surface lines. The rapid transit, or elevated, lines have another story to tell, but they have finally arrived at 10 cents, with a ticket rate of four for 35 cents. The following tables show the changes made in Chicago:

CHICAGO SURFACE LINES

Date in Effect	Cash Fare, Cents	Ticket Fare, Cents	Children's Fare, Cents
	5	....	
Aug. 7, 1919	7	Ten for 65 or Fifty for $3.00	4
Dec. 27, 1919	6	None	3
July 1, 1920	8	None	4

CHICAGO ELEVATED LINES

Date in Effect	Cash Fare, Cents	Ticket Fare, Cents
	5	....
Nov. 21, 1918	6	....
Aug. 7, 1919	8	....
Feb. 1, 1920	8	Two for 15
Aug. 4, 1920	10	Four for 35

Cincinnati, Ohio

Perhaps the most exaggerated example of the moderate fare changes, as costs go up and down, is found in Cincinnati, where the people and the company have agreed on a service-at-cost basis of operation. In a way it is typical of the point which it is desired to make. Without criticising the conditions of the contract, the facts may be stated that a slight increase in fare is allowed at the end of a three-month trial of one fare system, if that one has not paid enough to keep a certain check fund up to a specified amount. On this basis Cincinnati started its service-at-cost operation in August, 1918, with a cash fare of 5 cents and a ticket rate of five for 25 cents. Since then the following table tells the story of fare changes in Cincinnati:

	Adults		Children Under Ten Years	
Date in Effect	Cash Fare, Cents	Ticket Fare, Cents	Cash Fare, Cents	Ticket Fare, Cents
1896 to Dec. 31, 1918	5	Five for 25	3	Two for 5
Jan. 1, 1919	6	Six for 33	3	Four for 11
Apr. 1, 1919	6	Five for 30	3	None
July 1, 1919	7	Six for 39	4	Four for 13
Oct. 1, 1919	7	Seven for 35	4	Four for 13
June 1, 1920	8	Two for 15	4	Four for 13
Sept. 1, 1920	8	Five for 40	4	Five for 20
Dec. 1, 1920	9	Two for 17 or Six for 51		

It is most important to point out, in connection with the Cincinnati experience, that one of the efforts made to keep the cost of service from going up was that the Director of Street Railways, W. C. Culkins, ordered the local company to reduce the service.

New Orleans, La.

In October, 1918, as the result of the War Labor Board's increase in wages the 5-cent flat fare was increased to 6 cents, and again on Oct. 21, 1920, fares were increased, this time to 8 cents as the result of further wage advances to the employees.

Cleveland, Ohio

Cleveland is the first "service-at-cost" city and since the adoption of the Tayler plan in 1910 there have been various fare changes. Some one remarked recently that the Cleveland public continued to ride in as great numbers at high fares as at low fares and the rejoinder was that "the Cleveland public is trained to railway service the same way that it is trained to general merchandise purchasing; it is merely in the habit of getting on the car and asking the conductor 'how much.'" Since the Tayler plan was inaugurated fare changes as indicated in the accompanying table have taken place:

	Adult		
Date in Effect	Cash Fare, Cents	Ticket Fare, Cents	Net Transfer Charge, Cents
March 1, 1910	3	Five for 15	1
June 1, 1911	3	Five for 15	None
Sept. 1, 1914	3	Five for 15	1
Dec. 15, 1917	4	Three for 10	None
Dec. 26, 1917	4	Three for 10	1
April 3, 1918	4	Seven for 25	None
April 10, 1918	4	Seven for 25	1
Aug. 4, 1918	5	Seven for 25	1
July 5, 1919	5	Eleven for 50	1
Dec. 15, 1919	5	Six for 25	1
May 10, 1920	5	Five for 25	1
Nov. 14, 1920	6	Nine for 50	1

Boston, Mass.

Boston, Mass., as is well known, is now operated under a board of trustees representing the state. Since attempts have been made to meet rising costs by increasing fares the following changes have been made:

Date in Effect	Cash Fare, Cents	School Ticket, Cents	Exchange Ticket in Chelsea with Bay State, Cents
	5	None	3
Aug. 1, 1918	7	None	None
Dec. 1, 1918	8	None	None
Jan. 1, 1919	8	Ten for 50	None
July 10, 1919	10	Ten for 50	None

Washington, D. C.

Washington, D. C., presents an unusual case, in that there are two competitive companies, with entirely different systems. In order to protect the service of each of the two independent companies they have had to be considered together in adjustment of fares. Starting with a 5-cent cash fare, with six tickets for 25 cents, increases have been made as shown herewith:

Date in Effect	Cash Fare, Cents	Ticket Fare, Cents	Company Transfer Charge, Cents	Net Transfer Charges Inter-Company Transfers
	5	Six for 25	Nothing	No transfers
Nov. 1, 1918	5	None	Nothing	No transfers
Jan. 15, 1919	5	None	Nothing	Free Inter-Company transfers at thirteen points
June 1, 1919	5	....	2	Free
Nov. 1, 1919	7	Four for 25	Nothing	Inter-Company transfers, 2 cents
Dec. 13, 1919	7	Four for 25	Nothing	Abolished
May 1, 1920	8	Four for 30	Nothing	2 cents

Philadelphia, Pa.

Philadelphia is another example of fare increase, which has its own characteristics. Starting with a 5-cent fare, to which was added a 3-cent exchange ticket, or transfer for many of the transfer passengers, the management has held to the theory of a basic 5-cent fare even up to the present. The same story of increasing costs has to be told there too. These were met in Philadelphia by a great increase in riding and by the same devotion of the property or capital to the service of the public without adequate return. But finally even Philadelphia conditions could no longer allow continued operation without fare increase—the last wage increase which had been awarded to the men had to go unpaid—and various schemes were put forth. The management desired a 5-cent fare with no transfers, which would have been one sort of experiment; the Public Service Commission decided that this would be discriminatory against many riders and ordered the company to put into force, temporarily, as another experiment, a 7-cent rate with four tickets for 25 cents where the former 5-cent rate had been in effect, and to continue to sell the 3-cent exchange tickets as usual.

Portland, Ore.

On June 15, 1918, the former 5-cent fare, with free transfers, was changed to 6 cents cash with tickets in lots of five for 30 cents and fifty for $2.75. Transfers between city and interurban cars were eliminated in December, 1918. On June 15, 1920, the cash fare was raised to 8 cents and all reduced rate tickets abolished.

In order to present more graphically, and possibly more forcibly, the condition of many of the flat fare cities at the present stage of the development there are shown in accompanying illustrations outline maps of several of these cities, with information to show the area served for the flat fare, the population of the corporate city according to the 1920 census figures, and the fare system in force. These maps are all shown to the same scale in order to make the graphic illustration as forceful as possible. These were first published in the ELECTRIC RAILWAY JOURNAL Aug. 5, 1916, accompanying an article by D. J. McGrath, and were later published in "Street Railway Fares," Jackson and McGrath.

The Connecticut Company

Of the other type of fare experiments which have been made, namely, the distance-tariff schemes, the writer's own company, the Connecticut Company, is one example. It is also an example of flat fare changes, both before and after the zone system experiments. Starting with a 5-cent fare, the first change was made in October, 1917, when a rate of 6 cents was established on the old 5-cent limits. By 1919 this was proving to be inadequate and, to avoid any increase on the initial fare, the fare for the short distance rider, a zone system was devised in which zones were laid out of from 1.5 miles at and near urban centers to 0.8 miles in suburban and interurban territory. Taking New Haven as a typical city under this system, there is shown in an accompanying diagram the outline maps of the various zones under this system, which was installed Nov. 2, 1919. In fact, the various schemes are shown in a series of maps. Fig. 4 shows the former 5- and 6-cent city areas. Fig. 2 shows the zones with their areas under the first zone system. Under the first zone system the minimum and initial fare was 6 cents, for which a passenger could ride two zones or less. An additional charge of 2 cents per zone was made after the first two zones. Seventeen 6-cent zone tickets were sold for a dollar. Transfers were issued to allow any passenger to continue his ride for the same charge as if he had stayed on the original car. The traffic center was a zone dividing point in both the first and second zone schemes. As has already been related by the ELECTRIC RAILWAY JOURNAL, this system allowed some increase in revenue, enough to pay operating expenses and some fixed charges, but not all, by any means. It was later modified by what the Connecticut commission hoped would prove to be an improvement. Fig. 2 shows New Haven under the equal-length zone system installed by the commission on May 9, 1920. Under this zone system the cash fare was 3 cents per zone, with a minimum fare of 6 cents. A fifty-zone ticket was sold for $1, the minimum amount punched in this case being three zones, or 6 cents. There was also a calendar month commutation ticket sold at 1.75 cents per zone for suburban riders traveling five zones or more from the traffic centers of certain sized cities. These commutation tickets were non-transferable and were not good on Sundays and holidays. Under this system, also, transfers were issued to allow any passenger to continue his ride for the same charge as if he had stayed on the original car. This experiment did not provide as much revenue, comparatively, as the first zone system and was abandoned on Aug. 8, 1920, for a fourth change, from the old 5-cent system, as shown in Fig. 3. In this case a smaller area than the old 5-cent area was put on a 7-cent basis and a 6-cent area about 2 miles long placed outside of this. Suburban lines were put on a basis of 6 cents for 2-mile zones. This presented difficulties in two ways—it neither provided the necessary revenue nor was satisfactory to the public. Finally, on Nov. 1, 1920, a return was made to the old 5-cent areas with a 10-cent fare and commutation tickets under same conditions as before at 2½ cents per mile. Its effect cannot yet be correctly analyzed, for it has been in effect but two months, months that have suffered the general industrial depression. It is only fair to state, however, that from the standpoint of company revenue this system seems to be proving satisfactory. As compared with the corresponding periods of previous years, the increase in fare has not proved so objectionable to the public as might have been anticipated, for the number of passengers carried has decreased but slightly. Estimates in Connecticut are complicated by the jitney problem.

Milwaukee, Wis.

Milwaukee has the distinction of establishing in 1914 the first central area zone system with zones outside of the central area having a zone rate of less than 5 cents.

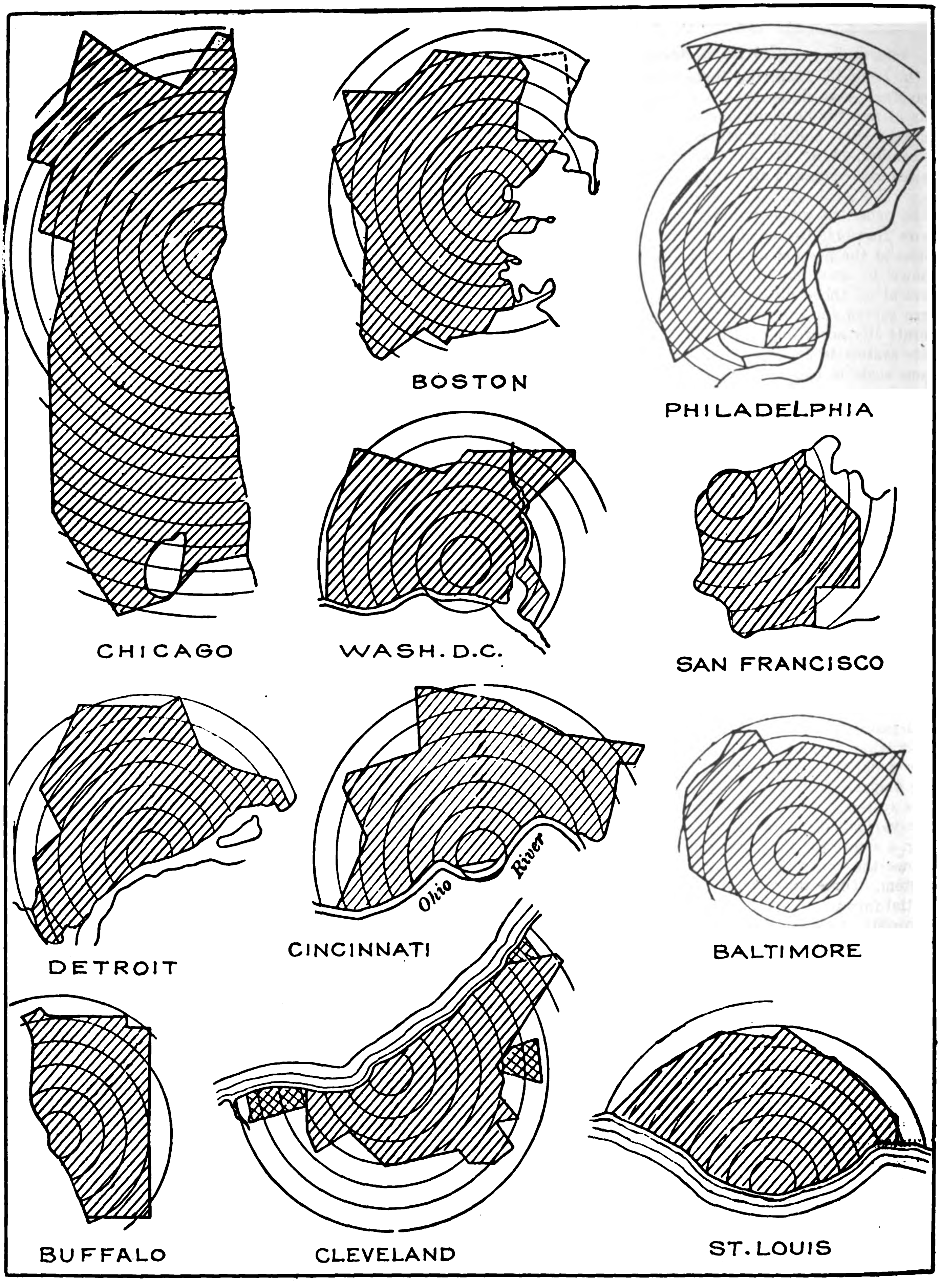
In December, 1913, the unit cash fare for a ride was 5 cents, with twelve tickets for 50 cents, and with free transfers within the one-fare area of Milwaukee, which corresponded approximately to the city limits. On Jan. 18, 1914, a central area zone system was made effective. The limits established at that time are in effect today, although changes have been made in the base fares both in the central area and in the interurban zones. These changes are shown in the following table:

	Central Area		Suburban and Interurban Zones			
Date Effective	Cash Fare, Cents	Ticket Fare, Cents	Cash Fare, Cents	Min. Fare, Cents	No. of Zones	Suburban Ticket Rate, Cents
Jan. 18, 1914...	5	Six for 25, twelve for 50, twenty-five for $1	2	5	2	....
Nov. 19, 1914...	5	Six for 25, twelve for 50 twenty-five for $1	2½	5	2	Thirty for 50
Jan. 30, 1915...	5	Six for 25, twelve for 50, twenty-five for $1	2½	5	2	Thirty for 50
June, 1918...	5	None	2½	5	2	Thirty for 50
July 3, 1918...	5	None	5	6	2	Thirty for 60
Nov. 2, 1919...	7	Six for 35 or 18 for $1	3	6	2	Twenty for 60
Feb. 3, 1920...	7	Six for 35 or nine for 50	3	6	2	Twenty for 60
June 7, 1920...	7	Eight for 50	3	6	2	Twenty for 60

Brockton, Mass.

Brockton, Mass., is taken as a typical illustration of the zone system of fares established on the Bay State System. Prior to October, 1917, there was a central area with 5 cents as the unit of fare and with free transfers. On lines extending beyond the central area boundary additional 5-cent zones existed. There were likewise overlaps from the center of the city area and extended transfer privileges and reduced rate tickets at varying rates. On Oct. 15, 1917, the rate of fare in the suburban and interurban zones was increased to 6 cents.

On June 24, 1918, an entirely new zone system (Brockton, Fig. 1) was established. This plan called for a central city zone in which the unit rate of fare was 6 cents cash with free universal transfers, and outlying zones having a base rate of 2 cents each and a minimum fare of 6 cents for three zones or less. Several forms of reduced rate tickets were sold—namely, six for 30 cents


CHICAGO
BOSTON
PHILADELPHIA
WASH. D.C.
SAN FRANCISCO
DETROIT
CINCINNATI
Ohio River
BALTIMORE
BUFFALO
CLEVELAND
ST. LOUIS

Diagrams Showing Relative Areas of Several Cities Which Operate on a Flat Fare Base

The population and present fare status of the cities shown here are given at the bottom of the page facing this illustration. The concentric circles on these maps are at mile intervals

(These maps are to the same scale as those on page 12.)

and six for 25 cents from the limits of the central zone to the traffic center, without transfer privilege. The latter form of ticket was for off peak travel and good only from 9 a.m. to 4 p.m. Mondays to Fridays inclusive, while the six for 30 cents tickets were good at all times. Two additional tickets of similar nature were sold from points in the first outer zone to the traffic center, namely, seven for 50 cents and four for 25 cents.

On Jan. 8, 1919, the above described central zone was abolished as such and the entire area of the first outside zone included in the central city zone area. (See Brockton, Fig. 2.) In the interurban territory two of the former 2-cent mileage zones were combined and the base rate per zone was made 5 cents. The unit fare, however, either in the central area or the interurban zones, was 10 cents cash, or reduced rate tickets good for a single zone ride were sold in lots of five for 35 cents. On July 1, 1919, the five for 35 cents reduced rate ticket was abolished. On Nov. 23, 1919, a new ticket rate was established from the limits of the central area to the traffic center. These tickets were sold in lots of sixteen for $1 and carried no transfer privileges whatever.

On Sept. 15, 1920, all free transfers were withdrawn, making the 10-cent cash fare good only to the traffic center. At the same time the reduced rate ticket was increased to fourteen for $1 and new outer limits established at what was practically the former 6-cent city area. (See Brockton, Fig. 3.) On Dec. 1, 1920, the ticket limits were again extended to the limits of the 10-cent city zone. (See Fig. 4.)

Portland, Me.

In Portland, Me., prior to Aug. 1, 1918, the fare limits consisted of a number of 5-cent zones of various lengths with a number of overlaps. (See Portland, Fig. 1.)

On Aug. 2, 1918, the Portland Railroad, with the approval of the Maine Public Utilities Commission, established the initial zone system having a central area varying in radius from 3 to 4.5 miles from the central point of the city. Outside of this area was a series of zones varying in length from 1 to 3 miles. The fare in the central zone was 6 cents with free transfers except on three lines which operated entirely within the central zone and through the business or short-haul territory. On these the unit rate of fare was 5 cents with a 1 cent charge for a transfer. The rate of fare in the outside "copper" zones was 2 cents for short zones and 4 cents for zones about 2 miles in length with a minimum of 6 cents. (See Portland, Fig. 2.)

On March 2, 1919, the former inner zone was divided into three fare zones, making the unit rate of fare per zone 2 cents with tickets or 3 cents if paid in cash, with a minimum cash fare of 10 cents or 6 cents with tickets for three zones or less. Tickets were sold in lots of fifteen for 30 cents. Passengers paying cash were entitled to rebate checks equal to the difference between the cash fare and the ticket fare, which were redeemable at reasonably convenient points but not later than the close of the day following date of issue.

Effective June 15, 1919, without change in zone limits the 6 cents with ticket or 10 cents cash fares with rebate were changed to 7 cents with ticket and 9 cents cash without rebate. On Aug. 1, 1920, the rates were further increased to 8 cents with ticket or 10 cents cash.

Providence, R. I.

In Providence the Rhode Island Company on May 5, 1918, established a zone system with a 5-cent central area and with 2-cent mile zones outside. (See Providence, Fig. 2.) This zone system proved inadequate as a revenue producer and was difficult of collection inasmuch as it was necessary to use duplex or tear checks.)

On Oct. 23, 1918, the system was revised with 5-cent zones (see Providence, Fig. 3) and for collection purposes the Rooke register was again put into use. This plan proved to have a greater earning capacity and if it had not been that the increase in cost of service outstripped the gain in revenue this scheme would in all probability have been in effect today, but due to the need of greater revenues the fare in each zone was changed on Sept. 28, 1919, to 6 cents.

Springfield, Mass.

Another city that has tried a zone system with a central area is Springfield, Mass. Prior to May 1, 1918, a uniform fare of 5 cents with free transfers was in effect. (See Springfield, Fig. 1.)

On May 1, 1918, the first zone system was established. (See Springfield, Fig. 2.) Under this plan the unit rate of fare was 5 cents in the inner and first outer zone. The inner zone had an average radius of about 2.5 miles, while the distance across the first outside zone varied from 2 to 4.2 miles. There were two classes of reduced rate tickets: one, from any point in the Springfield inner zone to a point five miles out, sold in lots of six for 40 cents; the second was six tickets for 50 cents which were good between points in the inner and first outer zone. In the Westfield division outside of the Springfield city limits the rate of fare was 2 cents per mile, except in Westfield, where the minimum fare was 6 cents.

On Sept. 16, 1918, the cash fare in the two Springfield zones was increased to 6 cents. The six tickets for 40 cents were increased to 45 cents and the six tickets for 50 cents increased to seven for 65 cents. In the Westfield division the zone rate was increased to 2.5 cents per mile but no change was made in the zone locations or the minimum fare in Westfield.

On Oct. 19, 1919, the present rates of fare were established. This change made the fare 7 cents in each of the two Springfield zones. The former six for 45 cents tickets were increased to eleven for $1 and the seven for 65 cents to nine for $1.

In the Westfield division the mileage zone rate was increased to 3 cents with a 7-cent minimum fare or ten tickets for 65 cents. The mileage zones on the Palmer division were rearranged by making one zone out of each two adjacent zones and the rate of fare was increased to 7 cents per zone.

DETAILED DATA TO ACCOMPANY FLAT FARE CITY AREAS ON PAGE 16

CLEVELAND, OHIO
Pop.—769,836*
Area—46 sq.mi.
Fare—6c., 9 tickets for 50c.

ST. LOUIS, MO.
Pop.—772,897.
Area—56 sq.mi.
Fare—7c. flat.

CINCINNATI, OHIO
Pop.—401,247.
Area—58 sq.mi.
Fare—9c., six tickets 51c.
Two tickets 17c.

CHICAGO, ILL.
Pop.—2,701,705.
Area—182 sq.mi.
Fare—Surface line 8c. flat.
Elevated 10c., four tickets 35c.

PHILADELPHIA, PA.
Pop.—1,823,158.
Area—91 sq.mi.
Fare—7c., four tickets 25c.
3c. transfers at many points.

BUFFALO, N. Y.
Pop.—506,775.
Area—38 sq.mi.
Fare—7c., four tickets 25c.

SAN FRANCISCO, CAL.
Pop.—508,410.
Area—40 sq.mi.
Fare—5c. flat.

BOSTON, MASS.
Pop.—748,060.
Area—81 sq.mi.
Fare—10c. flat.

DETROIT, MICH.
Pop.—993,739.
Area—58 sq.mi.
Fare—6c., nine tickets 50c.

BALTIMORE, MD.
Pop.—733,826.
Area—50 sq.mi.
Fare—7c. flat.

WASHINGTON, D. C.
Pop.—437,571.
Area—48 sq.mi.
Fare—8c., four tickets 30c.

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*Population figures are from the 1920 census report.

Worcester, Mass.

The Worcester (Mass.) Consolidated Street Railway, operating in Worcester and vicinity, had prior to July 1, 1918, a central area 5-cent zone system with the suburban and interurban zones of varying lengths. (See Worcester, Fig. 1.) Many overlaps also were in effect both from urban points to interurban points and in the interurban zones.

On July 1, 1918, the rate of fare in all zones outside of the urban central zone was changed to 6 cents. On Aug. 1 of the same year the unit rate of fare in the Worcester urban area was also made 6 cents. The third change was made on April 18, 1919, when the unit rate of fare in each zone, city and interurban, was changed to 7 cents with ten tickets for 65 cents and 33⅓ per cent increase in all reduced rate tickets. No alteration in the length of zones was made in any of these fare changes.

On Nov. 30, 1919, the system was rezoned (see Worcester, Fig. 2) and the unit rate of fare reduced to 5 cents per zone, with a traffic center established at Worcester City Hall. All reduced rate tickets except pupils' tickets were abolished as well as free transfers in the Worcester urban territory.

On Jan. 4, 1920, the unit rate of fare within the Worcester city limits was increased from 5 to 6 cents, with no change in zone limits or rate of fare on outside lines. On March 7, 1920, a further increase to the present rates of fare was made. This made the unit rate of fare within Worcester city limits 7 cents per zone and 6 cents in the outside zones.

Public Service Railway, Newark, N. J.

Another example of a zone system tried and abandoned is that of the Public Service Railway of New Jersey. An even more drastic zone system was put into effect there (Sept. 14, 1919), as indicated by the accompanying analytical maps of Newark, which may be considered typical. The first of these shows the former and present flat fare areas. Before trying a zone system the Public Service Railway had first added a 1-cent transfer charge to the 5-cent fare and later changed to a 7-cent fare with a 1-cent transfer, which rate was lowered for a time to 6 cents and 1 cent for transfer, but almost immediately returned to 7 cents with 1-cent transfer.

The zone map shown there is not exactly correct, except when considered from the standpoint of the traffic center. This method of drawing the map was the only one practicable, however, for it does give some comparison with the other places where zone systems have been tried. In this case each line, no matter what its source or route, without relation to any traffic center, was laid off in equal length zones and a straight distance tariff put into effect. The charge per zone was 2 cents, except that the charge for the first zone was 3 cents; no transfers were issued, but "continuous trip" checks were issued in some cases. On Nov. 15, 1919, the so-called "five and one" plan proposed by the Public Utilities Commission superseded the "three and two" plan. Under the new plan the rates were 5 cents for the initial ride on any car, which, however, entitled the passenger to ride two zones or less, with 1 cent for each additional zone ridden. A charge of 1 cent was made for a transfer to obviate the necessity for a passenger to pay the initial 5 cents on the line to which he transferred. The system finally proved ineffective, however, for reasons hard to analyze. The complete story of this and most of the other attempts being reviewed here have already been told by the ELECTRIC RAILWAY JOURNAL and will not be repeated except in review. Suffice it to say that the next step was to return (Dec. 7, 1919,) to the flat rate of fare, which is 7 cents, with a 1-cent transfer, the same that was in effect previous to the inauguration of the "three and two" system.

San Diego, Cal.

In San Diego a two-zone system with a 5-cent fare in each zone became effective on Jan. 1, 1920, superseding a 5-cent flat fare with free transfers. By this plan the city is divided into an inner and outer zone and the cash fare for a ride from the outer zone to any point in the inner zone or, in fact, across the inner zone to a point on the opposite side of the city in the outer zone, becomes 10 cents. Free transfer privileges are retained to connecting lines in either the inner or outer zones. Reduced rate tickets are sold in lots of four for 30 cents and monthly tickets good for purchaser only at the rate of 6.5 cents per ride. These tickets bear the same transfer privilege as cash fares.

From the review of fares, thus analyzed by the cities chosen, it appears that there is no known method of assessing fares upon the riding public that has not been tried in this national experiment. Some methods never heard of before have also been tried, as is evident.

Although it involves, possibly, a repetition of some statements earlier in this article, it should be pointed out that there is definite and conclusive showing that the managers of the various properties have done everything in their power to keep the cost of service to the car rider down absolutely to the lowest minimum possible; this in an effort not only to benefit the community by a low rate of fare but hopefully in regard to a continued use of the cars by low base rate. It should also be repeated that these fares have failed, at least in the earlier stages, to catch up with the increasing costs. This review also indicates, therefore, as was stated in another way earlier in the article, that the courageous and proper thing for the managements to have done would have been, early in the stage of increasing costs, to have placed the rate of fare at a high enough point to cover all these increases and to have recognized the fact that a declining number of passengers might be expected with radical increases in individual rates. Had this been done there is no question but that the industry would have benefited and the communities themselves would have been better served by thoroughly maintained properties, properties which would expand better to meet the needs of the communities than has been the case with this cautious effort to increase the revenues.

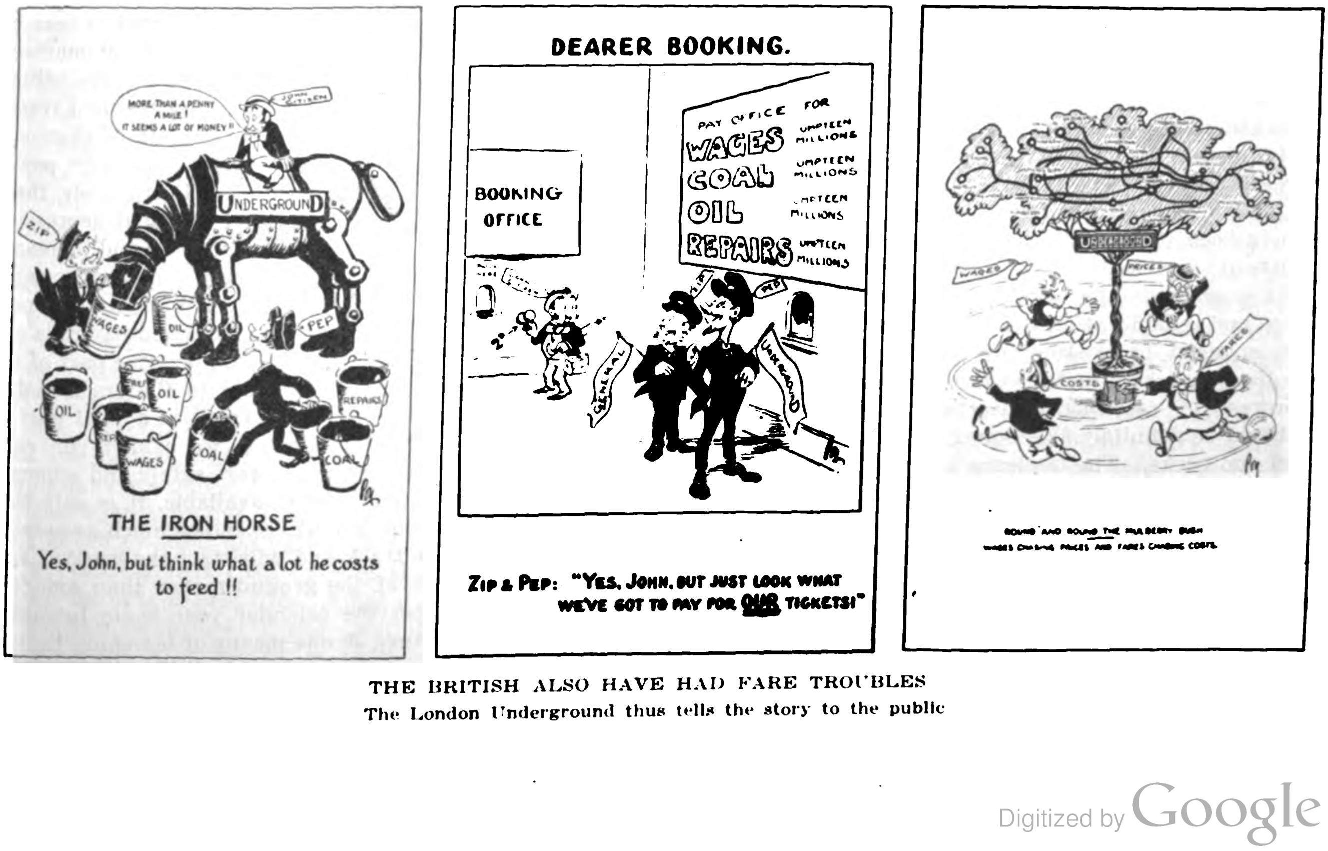
As to the future, he would indeed be an optimist who would predict the outcome. Some years ago the managers of properties might have been sufficiently optimistic to try this prediction, but in view of the past condition and the continuing need for increasing and ever increasing the gross income to meet payrolls, which are still advancing, no management would at the present time hazard an estimate of what the future may develop. It is doubtless true that costs will no longer advance and relatively few increases in rates from the present standard will be needed except such as are necessary to produce an income in excess of operating costs to meet the actual necessary return to the owners of the property.

It is also true that there is another aspect to this problem in respect to future reduction in rates. Due to the history of the industry as related above there has been created a deficiency in earnings in all cases, and an actual inroad into capital in many others, which the various properties have suffered in the past six years. There has been an accumulated deficit and a decrease in maintenance which must be met and the property brought to a high standard of maintenance and credit before it will be possible seriously to consider any rate reduction whatever. That this fact is already recognized by the public as represented by the public service commissions has been indicated in the recent decision of the Public Utilities Commission of Tennessee on the application of the Nashville Gas & Heating Company for increased rates, decided Nov. 30, 1920.* In this case the commission found that the company had suffered a deficiency in earnings and an impairment of maintenance due to inadequate rates. It determined this deficiency in earnings to be $118,000 and authorized the company to charge such rates as would be necessary to make the necessary return upon capital at present, which was set at from 6½ to 7½ per cent, and also to amortize this deficiency at the rate of $1,000 per month. The company was further authorized and ordered to "reinforce its service in the outlying residential districts . . . with its first available earnings over and above the 6½ per cent on the investment and the amount hereinbefore set out with which to amortize its losses since July 1, 1919, and that the company shall not pay dividends on any of its stock until this work be completed." It appears that this attitude is an appreciation of one of the points which this article has intended to emphasize, namely, that the utilities, and certainly the electric railways, have conscientiously continued to give the best possible service to the public, generally at rates which have failed to pay the full cost, and that consequently there has accumulated a deficit which must be made up before the railways can again be of greatest service to the communities and certainly before it will be possible to consider rate reductions.

It is incumbent upon the managers of the industry to impress upon the public the fact that undue caution has been the fundamental basis of all the rate advances in the past, and it is hoped that this contribution to the problem will assist in impressing upon the public the fact that none of the efforts to increase rates has at any time shown a sufficiently courageous attitude by the men charged with developing the service and sustaining the property and the corporation producing the service.

Another purpose of this article has been to show the experimental nature of the various fare changes that have taken place. It appears that this experiment has not ended. Where the industry is going as to fare systems and fare policies is also difficult to predict. It has been said that the trend is toward 10 cents. There is, of course, much to support this view, if a curve of fare changes is plotted, perhaps. But it appears that the industry can well consider the facts as they exist today. These facts, it appears, are that the public has been educated by the industry and by its own investigations into the matter to believe that costs of furnishing electric railway service differ in various cities in different parts of the country under the varying conditions which exist in these cities. Public opinion, density of population, riding habit, topography, living costs and the numerous other items which the industry has often talked of must be taken into consideration, and the public knows this. It is therefore very doubtful if any given fare, such as the former five cents, ever becomes so universally applicable as was that charge. Whether zone systems will prove practicable in the United States is not yet known. It is certain, however, that the final standardization of fare system for any community can be arrived at only after an intermediate period, during which the rate of fare shall be high enough to absorb the accumulated deficits of the past few years.

One conclusion which can be drawn from the experiment seems to be that the railways are in the habit of studying the matter in detail and that there is hope of arriving at a system of fares in America which will ultimately pay for the service, prove satisfactory to the riding public and allow the properties to grow to supply the transportation needs of the communities.



THE IRON HORSE

Yes, John, but think what a lot he costs to feed !!

ZIP & PEP: "YES, JOHN, BUT JUST LOOK WHAT WE'VE GOT TO PAY FOR OUR TICKETS!"

ROUND AND ROUND THE MULBERRY BUSH
WAGES CHASING PRICES AND FARES CHASING COSTS

THE BRITISH ALSO HAVE HAD FARE TROUBLES
The London Underground thus tells the story to the public

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*This decision is reviewed on page 63, this issue.—EDS.

When We Build Our Tracks

The Track Is the Vital Part of a Railway—Some of the Details Which Should Have Consideration in Connection with Track Construction Are Discussed—Some "Don'ts" Are Suggested for Study When Track Designs Are Being Prepared

By R. C. Cram

Engineer Surface Roadway Brooklyn Rapid Transit Company, Brooklyn, N. Y.

THE Federal Electric Railways Commission recently handed down a report emphasizing the fact that the electric railway is an essential utility which is and has been of great service in the development not only of the cities but also of the country as a whole. It is very desirable that the railways themselves shall fully realize the importance of the word "rail-way," because we are apt to forget that the rail is an essential part of the track and that the track is the fundamental part of the railway. The Public Utilities Commission of Connecticut made the following pointed statement in a recent decision: "From an analysis of the history and development of street railways the commission is led to the conclusion that even though the motive power may change, as it has in the past, the essential features of a street *rail* way will remain. For more than seventy-five years street railways have operated along a predetermined course, on *rails* or *tracks*, with every new form of motive power." (There is a temptation at this point to turn aside and comment upon the situation which has largely resulted from operation at a predetermined rate of fare since the fare question is behind most of our present track troubles.)

FIRST, WE MUST DECIDE WHETHER ALL OF OUR TRACK IS WORTH WHILE

No one except a jitney devotee will question the fact that the tracks are needed, but before we undertake to overcome the handicaps which have prevented adequate track reconstruction programs we should determine whether we really need all the trackage which we now have. There are many systems which are consolidations of lines which were formerly in competition and it has required a war condition to render evident the over-tracked state which may be found in numerous instances. Diminishing revenue revealed a number of situations where lines closely paralleling one another were not paying. They would have been seen not to have paid their keep if they had been operated as separate units instead of parts of a large system.

Consequently the beginning of the era of reconstruction and rehabilitation which is about to open should find us engaged in a study of our maps, population and riding statistics, and all the other aids incident to the process of reaching a decision as to what trackage should be definitely abandoned, sold as junk and written off the books. The tendency to hang on to unprofitable lines must first be overcome if we are to consider our industry as being subject to the same economic laws as those which control other industries. We should bear in mind that our paving obligations alone have reached such proportions that they may be large enough in some cases to turn a line from an asset into a liability. Incidentally a study should also be made of the gains which may be made by rerouting of lines which will naturally follow any curtailment in track facilities. We have ample evidence that re-routing has often been a great aid in speeding up traffic and in increasing business.

TRACK WORK IS FIVE YEARS BEHIND SCHEDULE

It is everywhere apparent that the reconstruction and the rehabilitation of tracks have been held back by the general lack of adequate revenue which has prevailed during and since the war. Little new construction was going forward in the years immediately preceding the war and, aside from war trackage, very little new mileage has been built for several years past. It is needless here to state the causes for the lack of revenue, but the "no funds" condition always puts a stop to expansion of electric railway facilities and leads to radical curtailments in reconstruction and maintenance programs. With such conditions prevailing over a long period the way engineers have been forced to devote their efforts toward keeping up tracks which in normal times would be considered as fit only for the scrap pile.

In track work it has not been so much a question of the degree of maintenance, but rather one of any maintenance whatever. With labor at a premium; with material costs high and going higher, the problem has been that of finding the means to do the patch-plus-a-patch sort of work to which most systems have been reduced. When a reasonable amount of track is not reconstructed yearly the general standard of track condition lowers perceptibly, and second-hand rail and ties which might be used in further patch-work become as scarce as new materials. Some of us have even been forced to take up tracks to secure materials for repairs in other quarters.

Most electric railways are at least five years behind in their renewal or reconstruction programs, and tracks all over the country are in a general state of disrepair which is costly in rolling stock maintenance, in power consumption and in slow schedules. Fortunately there seems to be a rift in the clouds of financial depression which have so long hung over the industry and increased revenues have resulted from the fare increases granted by a reluctant or indifferent public. While a large part of these increases is consumed in increased pay-rolls and fuel costs, it seems that there should be some part of the added funds which can be devoted to the track and it should be remembered that the track is a vital part of the railway. Without the track, we cannot run cars. With poor track we cannot run cars safely and economically. If there be any money available, it is safe then to assume that a company will spend as much as possible this year upon the track and will start the work as soon as the frost is out of the ground rather than sometime after June 30. Let the calendar year begin to control the track expenditure as one means of lessening the cost of the work.

Perhaps the opportunity for an ideal rehabilitation such as Chicago developed in 1908 may not be present, but we can apply some of the Chicago methods of attack and adjust our plans to our present-day needs. With this in mind our first duty is to make a careful survey of the several types of track found on the system with the view of determining age, car traffic and general condition. From this we may make up a table or budget indicating where we should rebuild and where we should overhaul. The data in the table should be grouped to indicate the desirable order of work not only for the current year but also for several years in advance, as it will be almost impossible to overcome a five-year handicap within any one season. It goes without saying that such tables should also show estimated costs for each item, with group totals. Most estimates of this character are also required to show the division of the expense between the capital and maintenance accounts.

Another table or group of tables containing the same items of work but made to show the quantities of rails, ties, joints and paving materials will also be found very helpful in case the program should be adopted. It is usually unwise to make them up before the adoption of a program, since managements have a habit of changing and rearranging almost any schedule submitted.

In making studies for budgets of this sort it may be advisable to set aside some of our prevailing notions that we know all about our track systems and to make an analysis of the several types of track in service. Sketches should be made of these and designated by type numbers or letters. The percentage of each type in use should be determined. The tracks should be dug up in spots occasionally and the condition of the ties, rail bases and rail fastenings studied. An attempt should be made to compare the relative lives of the different types in the light of traffic conditions. Sometimes it may be found that older types of track are giving better service than some of the more modern types. Such a condition, if found, should be the basis for a search into the causes. Having determined upon the latter, the obvious step is to apply ourselves to the modifications in design which will remedy the conditions.

THINGS TO AVOID IN TRACK REHABILITATION

In connection with the preparation of track designs some "don'ts" may be in order. Do not play too hard at the game of "follow the leader." It is all very well to follow standards, but it does not always pay to assume that some particular track construction standard as developed on one system will be suitable on some other system. Do not forget that our association standards represent the best thought and a wide experience, and that they can be followed with assurance of their worth, if properly selected and correctly applied. Incidentally a study of the way committee reports on proper foundation for tracks in paved streets, to be found in the 1914 and 1915 Proceedings, will be of assistance in rounding up all the factors which should have attention when track designs are under discussion.

Do not expect to get something for nothing. We cannot afford to build too lightly in an effort at cheapness by reducing first cost. We must consider that a track should have a long life. A life of thirty years is quite possible, with modern rails and pavements, as an average. Such track cannot be built cheaply in these times but we should not try to stretch the available budget beyond the elastic limit of substantial construction. It is better to shorten the program a mile now than to spend its cost in after years in excessive maintenance.

Do not design a track structure on the basis of a safety-car loading, unless satisfied that no other cars will every be run over it. No one knows whether the safety-car is here to stay, in its present light-weight form. Most properties still run much heavier cars and will continue to do so for years to come. The history of track construction reveals the fact that our early tracks were built too light. They were usually designed against loads produced by electrified horse-cars weighing about the same as our present safety cars. These tracks, and particularly the rails, did not withstand the ravages of corrosion, distortion due to undermining of track, increase in car weights and increase in operating schedules.

Do not forget that while track pavements are not strictly a part of the track structure the service which a track pavement will give is largely dependent upon the character of the track construction. The best pavement in the world will not overcome faulty track design and much of the criticism which is hurled at us today by civic authorities comes from defective track pavements.

GOOD PAVING IS A PAYING PROPOSITION

Efforts at lessening the track paving tax burden have been nullified very often by the paving conditions found in our tracks. Whether or not these are the result of improper selection of pavement, poor track, lack of funds or whatnot makes no difference to our critics. Hence our earnest efforts must be directed toward proving that good track pavements can be constructed and that such pavements are no more costly to maintain in tracks than elsewhere under equal traffic conditions. In this connection, the writer believes that much could be attained if arrangement were made to secure the co-operation of the American Society of Municipal Improvements with our own Engineering Association for the purpose of jointly studying paving materials and standards which would be mutually satisfactory.

If we are ever to get even a measure of relief from the paving burden, we must use our publicity to the utmost. It should be convincingly shown to the public that the costs for track pavements, when required by franchise, are really tax assessments. All legal opinion supports this view and we should let the people know that their fares must pay these taxes. One way of doing this is to let our investors know it also by changing our accounting methods so that pavement costs will be entered as "Taxes: Paving." These costs are now hidden away in Account No. 10 Paving, operating expense details.

From the paving at the top to the foundation at the bottom of the track is an inverse order in which to consider the track structure. However, there is little doubt that we have looked at the track too long from the top downward. So, another "don't" brings us to the track foundation where really we should have started.

Do not forget that the foundation of the track is the most important feature. The best of rails, ties and pavements may easily be ruined, or prevented from functioning properly, if the subsoil under the track has not received the attention it should have had when the designs were prepared. The soil upon which we lay our tracks should be studied just as carefully as though we intended to erect an office building upon it. It should be analyzed and the track foundation should be built with the view of not overloading the soil. Even in the same city, we often find sections where the soils are radically different and the ballast features of the track design must be changed accordingly. Drainage plays a big part in the treatment of subsoils and the neglect to provide it has caused more track and pavement failures than any other agency. Surface drainage is an item which should receive consideration. The installation of track drains aids in overcoming underdrainage troubles by preventing infiltration of surface water.

THE SUBSOIL SHOULD NOT BE OVERLOOKED

The character of the subsoil and the treatment required to render it stable, will be a determining factor in settling the question of the need for ballast. The subsoil may be very stable and of a self-draining nature, in which case the placing of ballast of stone or concrete may be unnecessary, but statistics have shown that fully 90 per cent of the mileage of tracks in streets is now ballasted with crushed stone or gravel predominating.

The kind of ties and general form of the track superstructure will also have an influence upon the ballast question. If some form of steel tie structure is to be used, the ballast will necessarily take the form of concrete. The writer has observed that the tendency in the past has been to skimp on the amount of concrete used in such cases and when the Carnegie type of steel tie was used, the ties were spaced too widely. In using such construction recently it was found advisable to space the ties 3 ft. on centers and to place 6 in. of concrete under them with no change in level of the concrete between the ties. Before the concrete was laid on the unstable soil found in this case, it was necessary to roll broken concrete and asphalt into the trench to a depth of 4 in. Five years' service has disclosed no track troubles of moment with this construction. Some of our earlier uses of these ties had disclosed the need for more concrete and closer tie spacing. Similarly, the use of other forms of steel ties should have careful study so that we may be sure we are not building too light. We must not expect either the tie or the concrete to do work beyond its capacity.

Meanwhile, the wood tie is not going out of date, even if its price has increased. The adherence to its use is partly due to the uncertainty of the performance of substitute tie construction. It is also due to the fact that most of us know how to lay wood-tie track and we also know that good wood ties will last indefinitely in well-drained, well-paved tracks. It is also much easier to get good track built under traffic with wood ties, and many of us cannot put track out of service long enough to cure concrete as it should be cured when it is used for the track structure itself.

WIDE RANGE OF STANDARD RAILS AVAILABLE

In selecting rails, the effort should be made to use association standard rails to the fullest extent. There are now nine standard rails available. These are 80, 90 and 100-lb. standard section (80-lb. A. S. C. E. and 90 and 100-lb. A. R. A. "A") rails; 7-in. and 9-in. girder grooved; 7-in. and 9-in. girder guards to match; and two plain girder rails, 7-in. 80-lb. and 7-in. 91-lb. These nine rails should give the widest range of selection to suit almost any condition. It may be noted here that the writer believes that the 7-in. depth of rail is the predominating one used for tangent tracks and the 9-in. depth is being relegated to the obsolete class. With the passing of the old-style 8-in. granite paving block and the betterment of rail joints, the arguments formerly applied to bolster up the use of the 9-in. rail have fallen rather flat. Chicago continues with it because ordinances stipulate that it shall be used. Philadelphia probably sticks to it because old-style, deep granite paving blocks are still found there in abundance. Furthermore, the saving in weight in favor of the 7-in. rail can be applied toward increasing the amount of track obtained for a given tonnage.

In regard to joints, so much has been said about the tendency towards the use of the welded joint of some kind that it is hardly necessary to call attention to its increasing use. It is believed that some form of welded joint is an essential to first-class permanent track construction in paved streets.

Track pavement selection is seldom within the sole province of the railway company. City engineers have their say, and the railways usually have to install whatever pavement the city deems expedient. Many companies have been forced to install unsuitable track pavements for this reason and to take the blame for their poor condition as well. Such conditions call for greater efforts toward co-operation with city engineers for the purpose of securing pavements which are mutually satisfactory. The principal two questions to be decided in connection with track pavements are: (1) Is the track suitable to receive the pavement, and (2) is the pavement one suited to the track and street traffic.

LABOR-SAVING DEVICES NEED FURTHER DEVELOPMENT

The intensive use of tools and machinery designed to save labor should be continued and even extended in quarters where we have thought that machinery which would replace manual labor could not be devised. The track construction and reconstruction task has proved a fertile field for the installation of machinery, and surprising results have been attained in keeping costs down despite the rising labor costs.

There are a few features of track work which have withstood efforts to introduce mechanical in place of manual methods. The difficulties which now seem to prevent further progress in "doing it mechanically" should be the object of renewed attack and the writer believes that we will see notable developments along such lines during the next year or two. Meanwhile, our manual methods may need overhauling and a careful study of methods of doing particular parts of the work will often disclose exceptional savings which can be made through what appear to be slight changes in details.

There has been some tendency toward a relaxation in the rigidity of our specifications for materials. We have often been forced to accept inferior quality in order to keep work going. This may have led us to consider that the inferior article is good enough; especially when the price of inferior articles has been higher than the price of the best ought to be.

It is now time to take up the matter of material specifications with a view to a speedy return to a more rigid adherence to their requirements. So with the minor tools used in trackwork, we should realize more than ever that tools of poor quality are wasteful of very costly labor. Track chisels, picks and bars should be made of the most durable material obtainable. Shovels of extremely long wearing material are now available and present labor costs warrant their use more than ever. It now costs about $5.50 per day to work a shovel, whether the latter costs one dollar or two.

Moreover, having secured good tools, we should use every precaution to see that they are properly used and that they are kept in a good state of repair.

Outlook for Service-at-Cost Franchises

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THE AUTHOR gives an extended review of the service-at-cost franchises adopted during the past two years, as well as those rejected and the changes made in those modified during this period. He concludes with a discussion of the arguments against this form of franchise. For the most part, these center about the question of incentive for economical operation, and Mr. Nash finds most recent service-at-cost franchises include such a clause. In conclusion he cites such a provision in a rejected franchise which aimed to overcome objections raised to the usual form of this clause. The article is a supplement to the exhaustive one from Mr. Nash in the issue of Jan. 4, 1919.

TWO years ago the ELECTRIC RAILWAY JOURNAL gave to its readers an outline of the origin and development of service-at-cost franchises in the electric railway field. During the two years since passed there have been noteworthy additions to the list of service-at-cost cities and there is a substantial number of other cities in which service at cost is under consideration. On the other hand, experiences with earlier franchises of this form have developed certain shortcomings and criticisms which have in part been responsible for the rejection of the service-at-cost plan in several cases. All these facts should be fairly faced and analyzed before unqualified approval can be extended to this method of settling the complicated and pressing financial problems which have become particularly acute in the past two years of electric railway history.

During this period the Federal Electric Railways Commission made an exhaustive study of the electric railway situation and presented a report to the President recommending service at cost as one of the most promising steps to be taken. This recommendation, made after a most thorough investigation of this particular phase of the subject, is entitled to very great weight, and indicates that, in the judgment of this commission, any defects so far observed are not insurmountable.

It is the purpose of this article briefly to summarize the significant features of the new service-at-cost grants which have become effective, those which are under discussion and those which have failed of adoption, with particular reference to the reasons for the failures. Reference will also be made to certain criticisms of the service-at-cost program—all to the end that the advantages, disadvantages and practicable modifications of this method of operation may be clearly comprehended and our future activities in this direction shaped accordingly.

Effective New Franchises

YOUNGSTOWN

This franchise, which became effective in January, 1919, runs for a term of twenty-five years. In order to remain in full effect it must be extended at intervals of ten years. In general it is patterned after the Cleveland grant, having allowances on a car-mile basis for operating expense and for maintenance, repairs and renewals. In this respect it has departed from recent practice which has come to look upon such allowances as cumbersome and as having few practical advantages.

The franchise provides for a commissioner to supervise street railway operations and act as adviser to the City Council, which retains general jurisdiction over important proceedings including regulation of service, ordering of extensions, financing, etc. With respect to capital value and the return thereon, the program departs somewhat from the Cleveland standard in that it allows a fixed return of 7 per cent upon an initial capital value of $3,900,000, plus working capital and the fare stabilizing fund, but adds the actual interest and dividend requirements upon securities sold for additions and improvements, all of which are issued under the specific direction and approval of the city and added to capital value at par whether or not sold at that price.

Extensions and improvements to the property are handled in the conventional way, with the limitation that no expenditures for such purposes can be required by the city when they will impair the present or future ability of the property to earn the authorized return, or if required financing is impracticable.

The balance of the company's revenues, after operating and up-keep allowances are deducted, is deposited in a fare stabilizing fund, from which taxes and the return on the investment are withdrawn. For the purposes of fare regulation the lower and upper limits of this fund are placed at $50,000 and $150,000, respectively, these limits acting as automatic indicators of the requirement for increased or decreased fare. The conventional program of fare steps is provided, ranging from 3 cents to 9 cents cash, with 1 cent additional for transfers in all cases and with reductions for tickets purchased in quantities. When either end of the initial schedule of fare steps is approached, additional steps are provided for, consistent in their effects upon revenues with the steps initially established.

The city is given the right to purchase at any time on six months' notice, the purchase price being the then capital value with the usual adjustments for reserves, current assets, liabilities, etc. As the Youngstown street railway system is a part of the property of the Mahoning & Shenango Railway & Light Company, doing also a lighting business in Youngstown and railway and lighting business in other localities, it was the desire of the city that the property affected by this franchise be separated from the balance of the system if the necessary corporate arrangements could be effected. To this end the city purchase terms provide that, if a new railway company is promptly organized to take over the property affected by this franchise, the price at the time of purchase should be increased to 10 per cent in excess of that otherwise due.

In order to secure stability both of investment and service, which could not be assured if the franchise approached termination without plans for future operation, the stipulation is set up that when the unexpired life of the grant or any renewal thereof is less than fifteen years the company may amortize its entire capital value during the remaining period of the grant on a 7 per cent sinking fund basis and increase its fares to take care of the amortization requirements. If at any time during this remaining period the city should see fit to grant a renewal, the accumulation in the amortization fund may be used for extensions and improvements or to retire outstanding securities. During any amortization period the company is not required to extend its property, but may do so upon its own responsibility.

The grant contains a novel provision with respect to penalties for violation of requirements under the franchise as interpreted by an arbitration board. If the company refuses to abide by an arbitration decision, the arbitration board may, as in the case of the Cleveland grant, reduce the authorized return on the capital value by an amount not exceeding 1 per cent. Offsetting this there is the added provision that, if the city fails to carry out any arbitration requirements, the return to the company may be increased upon the order of the arbitration board by not more than 1 per cent. The grant contains the usual arbitration clause covering the settlement of a wide range of disputes, and also continues the obligation of paving repairs and renewals contained in prior franchises, which obligation has been curtailed or omitted in a number of recent franchises of this form.

Operations under this grant began with a cash fare of 5 cents, plus 1 cent for transfers, an operating allowance of 22 cents per motor car-mile and a corresponding maintenance and renewal allowance of 8 cents per car-mile. Under the operations of the franchise, fares and allowances have already been repeatedly increased to take care of increasing operating costs.

MEMPHIS

Effective April 1, 1920, the Memphis Street Railway began operations under a service-at-cost plan embodying features not theretofore employed. The program involves no change in the company's franchise, but, in response to the company's application to the Public Utilities Commission for an increase in fares, the commission, after determining the value of the company's property, prescribed a service-at-cost plan of operation under its own supervision instead of the usual local control, to the end that the company might always render service satisfactory to the city with fares automatically adjusted to the cost of such service without recurrent formal appearances before the commission.

The commission established the conventional fare index fund with lower and upper limits of $60,000 and $200,000, respectively, and a schedule of fares ranging from 5 cents to 8 cents with ½-cent steps, the range to be extended when either upper or lower limit has been approached. Except in emergencies, fares are to be changed only on any Jan. 1 and July 1, if the fare stabilizing fund has reached either the upper or lower limit and has moved toward such limit during two preceding months.

The cost of service includes a 7½ per cent return upon the established value of the property unless the fare index fund is thereby reduced below the lower limit, in which case the return may be reduced to not less than 6½ per cent. If the fund is exhausted at any time, money for the minimum return or other purposes may be borrowed, to be later made up with interest from increased revenues.

The commission established a flexible provision for depreciation annuity, under which the normal annual appropriation is 3 per cent of the property value. If, however, the accumulated reserve exceeds $500,000, the annuity is reduced to 2 per cent; if the accumulated reserve falls below $300,000, the annuity is increased to 4 per cent.

Another unusual feature is the setting up of a standard of service, determined by the commission, adequately to take care of local requirements. This standard is expressed in car-miles per revenue passenger, the upper and lower limits being fixed at 0.185 and 0.155 respectively.

In establishing a value for the Memphis railway property the commission was liberal in its recognition of development cost, cost of financing and other overhead charges often given scant consideration, so that, while the percentage of authorized return is not as liberal as appears in some recent settlements, the dollars available for investors are not unreasonably low.

In its administration of operations in Memphis the Utilities Commission has recently found it expedient to appoint a local agent. This agent performs substantially the functions of the supervisor, appointed under most service-at-cost grants as the representative of the city.

ROCHESTER

A new franchise was granted to the Rochester lines of the New York State Railways, effective Aug. 1, 1920, for a term of ten years, with provisions for renewal after the expiration of nine years. Supervision of operations under this franchise is in the hands of a Commissioner of Railways, who has exceptional authority in all matters having to do with the service or property. He is limited with respect to extensions that may be ordered because of the short life of the grant, which states in dollars the limits by years permitted after the first five years.

The usual fare stabilizing fund is provided with lower and upper limits of $200,000 and $500,000, respectively. The automatic fare schedule also contains the usual steps, the initial rate being 7 cents cash, 6¼ cents tickets. The rate of return varies with the rate of fare, being 6 per cent for a cash fare of 7 cents or more, and grading upward to 8 per cent, if a 3-cent cash fare should ever be reached.

If it is necessary to borrow money at an actual cost in excess of the base allowance of 6 per cent, the excess over this rate is charged as an operating expense.

Accruals for depreciation are at the rate of 2 per cent per annum on the capital value, but the accumulated reserve is limited to $600,000.

Arbitration is provided for, and each party to the agreement bears one-half the cost of arbitration proceedings from its own funds.

The company reserves to itself exclusive control over its corporate affairs, selection of officers, employees, etc., and is authorized to arrange "supplemental transportation" if it appears in the interests of the city. One-man cars are also specifically permitted. No provision is made for city purchase. The initial capital value was temporarily placed at $17,500,000, but is later to be determined by agreement or arbitration.

TOLEDO

After many years of bitter controversy over the street railway situation in Toledo, the city and the Toledo Railways & Light Company have finally agreed upon operation under a service-at-cost grant which now awaits only the formal acceptance of the company before going into effect. The same problem of separating railway property and operations from other activities of the company arose as in the case of Youngstown and was solved in Toledo by the organization of the Community Traction Company, which will be a subsidiary of the present combined company.

The grant provides for transportation service by rail "or otherwise" for a term of twenty-five years, with renewal, lease and purchase features. The general responsibility for operations rests with the City Council, although the grant provides for a Board of Control of three members appointed by the Mayor, to act without compensation, as advisers to the City Council and to the commissioner. The commissioner has immediate charge of the street railway service and acts as technical adviser to the Board of Control and the City Council. The city also has at least one member on the traction company's board of directors, but if the common stock of the company owned by the city bears a sufficient proportion to the total capital value, the city's representation on the board may be increased. The company votes the issued common stock until it has been acquired by the city.

The capitalization scheme of the newly organized Community Traction Company is of interest. Initially it will issue $8,000,000 of bonds covering existing railway property, plus $2,000,000 of preferred stock to provide working capital, a fare stabilizing fund and funds for rehabilitating and rearranging the existing property. There is provided in addition $10,000,000 par value of common stock, all to be initially held in trust, but ultimately to be acquired, in part at least, by the city under conditions later described. The capital value for rate purposes includes only the initial bonds and preferred stock and such additions thereto as are necessary to take care of extensions and improvements to the property. It is intended that through future financing the preferred stock issue shall be increased to not less than 40 per cent nor more than 60 per cent of the capital value.

The cost of service, as defined by the franchise, includes expenses of operation; an accrual to be determined by the Street Railway Commissioner for maintenance, repairs and renewals, the amount not necessarily being uniform from year to year or from month to month; taxes and public charges of all kinds, including income taxes and interest on floating debt; a depreciation annuity of not less than one-half of 1 per cent nor more than 1½ per cent of the capital, with an accumulated reserve of less than 4 per cent of the capital value; a sinking fund of 2½ per cent of the capital value, but not accumulating to more than 20 per cent. and return to investors, including interest at 6 per cent on the bonded indebtedness and dividends at 8 per cent on the preferred stock.

All the above items of cost are cumulative. With the exception of interest and dividends, they are taken directly from operating revenues. Monthly balances are deposited in the fare stabilizing fund, from which returns to investors only are taken. The fare stabilizing fund has lower and upper limits of $300,000 and $500,000 initially, but ultimately they will become 3 per cent and 5 per cent, respectively, of the capital value.

The original fare schedule contains fourteen steps lying between 5 cents and 7 cents cash, with reduced ticket rates and a 1-cent charge for transfers under all rates. This schedule may be extended up and down without limit to meet wider ranges in cost than provided for by the original steps. The initial cash fare will be 6 cents.

The City Council, the Board of Control or the company may propose extensions which the company is required to make if the necessary financing can be reasonably accomplished and the present or future ability of the company to earn the authorized income is not thereby impaired. Where new property elements take the place of old, only the excess cost of the new elements over the cost of the old elements at the time of the replacement is added to capital value. By this arrangement the capital value is not increased in connection with replacements by any increase in general price levels.

The 2½ per cent sinking fund included in the cost of service is used to retire outstanding bonds up to 20 per cent of the total capital value. As these bonds are retired an equal par value of common stock is released to the city, but without any corresponding reduction in capital value. To that extent the city has an increasing ownership in the property, but limited to 20 per cent, except for amortization features referred to below.

The city may, on six months' notice, purchase the property of the company at any time at the then capital value plus premiums on outstanding bonds (4 per cent) and preferred stock (8 per cent), less common stock issued to the city, and with the usual adjustments for reserves, etc.

The city may also, after a favorable referendum vote, lease and operate the property of the company, paying all taxes and public charges and 8 per cent return upon the entire capital value less bonds and preferred stock retired. The city must also, under such lease, accrue 4 per cent of the capital value in place of the prescribed bond sinking fund for amortization purposes. When, under such lease, the city has retired not only the remaining outstanding bonds but also the entire preferred stock, it may take over the property without further capital payments. The city may also elect, when the salvage value of the property only remains in outstanding securities, to continue the lease indefinitely by extending the franchise from time to time and paying into the amortization fund only such amounts as are necessary to bring new property elements down to their salvage value.

The company, under such lease, may build extensions to the property, but it is not required to do so. If the city terminates a lease at any time and returns the property to the company there must be a franchise extension if necessary to give the company a ten-year period of operation, in which it may amortize all remaining outstanding securities, charging the necessary higher fare for that purpose. At the end of such period the property reverts to the city without payment other than adjustments.

If the city elects neither to lease nor to purchase, and the franchise term comes to less than fifteen years' balance, the company is authorized to increase its fares sufficiently to amortize the outstanding securities uniformly during the period. Additions which the company may make to the property during this period with the approval of the city may be amortized during the balance of the grant, but no such additions shall be required.

When, at the final expiration of the grant, all securities outstanding have been retired, the system becomes the property of the city. If an offer of renewal or extension of the franchise is rejected by the company the privilege of amortization does not apply until fifteen years from the end of the extension offered.

It will be recalled that Toledo has made various unsuccessful efforts to purchase the local railway property, but has encountered insuperable obstacles. It should be pointed out that the present franchise provides not for service at cost but service at cost plus an installment of the purchase price of the property, and so the car riders under the operation of this grant will necessarily pay a part of the cost of service belonging to future years. If the desire for municipal ownership should disappear under peaceful and satisfactory operations under this franchise, and extensions thereof, rather than purchase or lease should be made, the city's interest in the property would be limited to 20 per cent and the amortization burden of the present generation of car riders would not be serious. Under the lease provisions or in case of failure to renew the grant, however, the cost of service might increase to a burdensome extent. Other than for this feature of the franchise, it holds promise of a successful solution of long-standing difficulties.

PADUCAH

The reference to service-at-cost settlements effected during the past two years would not be complete without mention of a franchise involving some service-at-cost features which became effective in Paducah, Ky., on Oct. 1, 1919. In negotiating this franchise it was found expedient to avoid many of the complications contained in the usual service-at-cost grants if reasonably satisfactory adjustments of fares could otherwise be secured. The new franchise, therefore, simply provides for annual adjustments of fares to meet existing cost of service, as shown by the experiences of the preceding year, but without definitely determining a fixed value of the property or the return which should be allowed thereon.

Rejected Franchises

Attention should now be directed to certain service-at-cost plans of operation which have been drafted in substantially complete form by agreement between interests representing the cities and their street railways, but which have finally been rejected. These rejected agreements are referred to because they embody features which may be of interest or assistance in connection with future drafts of this kind.

DENVER

Early in the war period the Denver Tramway Company found itself in need of additional revenue which was not adequately provided after recourse to various public authorities. A committee of representative citizens was finally appointed to investigate the situation and report to the Mayor as to the best solution of the difficulties. This committee, after thorough and impartial investigation, reported that a service-at-cost plan of operation under the existing franchise was desirable. An agreement of this kind was accordingly prepared embodying service-at-cost features not radically different from those recently encountered, among which the following may be mentioned:

Supervision is lodged in a Board of Control consisting of three members, two representing the city and county of Denver and one the company. The normal rate of return allowed (after a preliminary lower rate) is 7 per cent, with a graded bonus for efficient operation, fixed by the rate of fare in effect. The maximum bonus is 1 per cent, applying only when the fare is less than 5 cents; at 5 cents the bonus is three-quarters of 1 per cent; at 6 cents, one-quarter of 1 per cent, and at higher fares, nothing. Accruals for depreciation were fixed at $450,000 per annum instead of the usual percentage on the property value. The fare stabilizing fund has lower and upper limits of $100,000 and $500,000, respectively, with an unlimited schedule of fares in half-cent steps, with free transfers.

The company is freed from franchise taxes, bridge rentals and paving costs and repairs. The original recommendation of the committee that no free transportation of any kind be granted was not embodied in the franchise. The conventional arrangements for arbitration and city purchase were also included.

This agreement, together with another simpler one for fare regulation proposed as an alternative, was rejected by referendum vote in October, 1919, by the very narrow margin of 235 votes out of a possible voting list of nearly 100,000. The rejection was apparently based not on the program itself, although the valuation agreed upon was criticised, but upon any rearrangement which would not place some restrictions upon fares.

MINNEAPOLIS

Early in 1919 a service-at-cost plan of operation was drafted for the City Council of Minneapolis as a solution of existing fare deficiencies. The program was approved by the Council, but was strongly opposed by the Mayor, and was finally defeated by referendum in December, 1919.

The general program does not depart substantially from the usual provisions of such grants. The authorized rate of return upon a $24,000,000 value was 7 per cent, the return on additions to be at cost plus 1 per cent, unless the city should undertake to guarantee this cost rate. The allowance for maintenance, repairs and renewals was 2¾ per cent of the capital value, plus 9 per cent of the annual revenue. The fare stabilizing fund had lower and upper limits of $150,000 and $500,000, respectively, and the schedule of fares showed the unusually large difference of 1 cent between steps. City purchase at the capital value and purchase by a licensee at a 10 per cent higher amount were included. The requirements for paving, cleaning, watering and oiling of streets could be waived by the city if excessive fares resulted therefrom.

ST. PAUL

The Twin City Rapid Transit Company had the same difficulties with an inadequate revenue in St. Paul as in Minneapolis and undertook negotiations to remedy the situation at about the same time. A service-at-cost draft was presented by the company to the city embodying provisions not radically different from those recommended in Minneapolis. This proposition was never accepted by the City Council, which, on the contrary, proposed a regulatory program wholly unsatisfactory to the company. Obviously the two main divisions of the Twin City system could not be operated under substantially different fare and service regulations without embarrassing complications, and these were considered in St. Paul after the rejection of the Minneapolis program.

HOUSTON

After exhausting other efforts to secure increased fares, the Houston Electric Company early in 1920 secured an injunction through the federal court against a 5-cent fare ordinance. In connection with the court proceedings, the value of the property was determined as well as the fair return and allowances for depreciation. These matters having been established, the city and the company undertook to agree upon a new franchise on a service-at-cost basis which would settle future fare and service problems. The final agreement between city officials and company officials, which also had the approval of an advisory board of citizens, was embodied in a franchise draft which the City Commission voted to submit to referendum without prior passage or indorsement. The indorsement was withheld because some opposition developed among the city officials to a few provisions of the draft, including the specified rate of return. The company felt that complete co-operation was necessary for the successful functioning of the proposed settlement, and, because of the lack of unanimous support, it requested that the draft be withdrawn from referendum until such time as complete co-operation might be secured.

The service-at-cost draft, as agreed upon, embodied some interesting features. It covered service by street railway or "other method of transportation." The Board of Control, which was to have jurisdiction over operations under the franchise, was composed of four regular members, two appointed by the city (one of whom must be the Mayor) and two appointed by the company. If these four were unable to agree upon procedure in any matter, a fifth member was selected to sit and decide with respect to this particular matter.

A return of 8 per cent upon the capital value was stipulated for at least seven years of the thirty-year term. A supplementary return was provided as an incentive for efficient operation not exceeding 1 per cent, which was authorized when a 5-cent fare became effective. The highest fare at which the incentive applied was 7 cents cash when the incentive was one-fifth of 1 per cent.

The fare regulating fund had a normal initial amount of $250,000, to be increased from time to time with the development of the property and its business. The maximum and minimum amounts of this fund—the points at which changes are automatically required—were 40 per cent above and 40 per cent below the normal, respectively. Changes in the fare were to be made quarterly when the fare regulating fund indicated the necessity.

The depreciation accruals were intended to accumulate by annuities not exceeding 4½ per cent of the depreciable property value, a total reserve lying between 8 and 10 per cent of such value.

Franchises Under Consideration

In addition to the above cities in which definite steps have been taken to bring about service-at-cost operation, a number of other cities have given the subject considerable attention as a solution of problems resulting from inadequate fares and service. In some cases this solution has been rejected, while in others it is still under investigation. A brief mention only of these cities, with the significant developments, is permissible herein.

INDIANAPOLIS

Early in 1920 the Indiana Public Service Commission, at the request of the city, undertook to draft a service-at-cost plan to solve fare difficulties. This general plan was approved by the company, but, after extended negotiations, the city recently withdrew its application to the Public Service Commission to settle the matter on this basis because of a feeling that, due to its lack of an incentive for efficient operation, the conventional service-at-cost program did not offer a satisfactory solution.

BUFFALO

In 1919 this city undertook to settle its controversy with the International Railway Company by a service-at-cost plan. Enabling legislation agreed upon between the city and the company was, however, vetoed by the Governor, following a protest from the Public Service Commission. The Mayor of Buffalo not long ago revived his interest in this form of settlement, but nothing has so far been accomplished.

DETROIT

Detroit, in 1919, after years of controversy quite similar to those which Cleveland and Toledo have experienced, received from its Board of Street Railway Commissioners a report recommending service-at-cost operation. Although this report was indorsed by the business interests of the city, it was strenuously opposed by the Mayor, and ultimately rejected by the city in favor of a municipal ownership program.

LIMA

During the past year service-at-cost has been proposed for the lines of the Ohio Electric Railway in Lima. The proposition was opposed by a citizens' committee, and no action has yet been taken thereon by the City Council.

NEW ORLEANS

The receiver of the New Orleans Railway & Light Company recently proposed a program of this form for settling the fare and wage controversies which have been pressing in New Orleans. This suggestion was indorsed by special masters who served in a wage controversy, but no definite action has resulted.

SYRACUSE

The New York State Railways proposed service-at-cost for its lines in Syracuse similar to the plan adopted for the part of its system located in Rochester. A valuation of the property was made by a committee, but the whole program was finally rejected by the City Council in November, 1920, apparently because of the higher fares which would probably be necessary thereunder, it being alleged that the proposed valuation was excessive.

LOUISVILLE

The officials of the Louisville (Ky.) Traction Company suggested in July, 1920, that its inadequate fares be taken care of automatically under a service-at-cost agreement. The City Council rejected the suggestion, but the matter has recently been reopened by the Mayor.

PITTSBURGH

In 1919 a report on the value of the railway property in Pittsburgh (Pa.) was made by a joint board, and the proposition that a service-at-cost agreement be entered into was indorsed by the Allied Board of Trade. Following this action, the Mayor, in April 1920, proposed negotiations looking to such a settlement, but definite results are still lacking.

AKRON

More favorable developments are in prospect for the lines of the Northern Ohio Traction & Light Company operating in Akron. The general terms of a service-at-cost settlement have been informally agreed upon between the City Council and the company. The tentative agreement provides for a return of 7 per cent when fares are 6 cents or higher, and a supplementary return of one-quarter of 1 per cent for each step in the fare schedule lower than 6 cents, the steps being ½ cent each. An additional return is allowed to take care of any higher actual cost of future borrowed funds. A sinking fund is provided to amortize the capital value if the franchise comes to within ten years of expiration without being renewed. The city waives its right to assessments for new paving, although the company undertakes to keep existing paving in repair. If extensions to the system are needed and the company is unable to procure the necessary funds the city may finance them and get the same return thereon as is allowed to the company. The company is authorized to operate an auxiliary bus service if it appears to be a desirable substitute for track extensions into outlying territory. The city may purchase or lease upon a year's notice.

NORFOLK

In 1919 service-at-cost was proposed for the railway lines in Norfolk (Va.) by the City Manager, and the city has gone on record as favoring liberal treatment of all industries which are located therein. No definite action with reference to the railway has been taken, although a recent report of the consulting engineers retained by the city to investigate the local situation strongly advises a settlement embodying service-at-cost features. The matter will doubtless have further attention in the near future.

GRAND RAPIDS

The franchise of the railway lines in Grand Rapids (Mich.) expires in 1921. A valuation of the property is now being made and the draft of a new franchise containing service-at-cost features is in progress.

ST. JOHN

An interesting plan for the operation of the public utilities in St. John (N. B.), including the street railway, was proposed in 1919 by a special commission appointed by the Lieutenant-Governor in Council. Under the proposed plan a basic return of 7 per cent is suggested, this rate to be increased by 0.1 per cent for each 1 per cent, by which the average rate is reduced below that existing in the first six months of 1919, and the basic return may be reduced similarly for any necessary increases in rates, but not below 6 per cent, nor are increases effective above 9 per cent. The rate of return is to be adjusted semi-annually. Control of the company's affairs is to be vested in seven directors, four chosen by the company and three appointed by the Lieutenant-Governor in Council. Sale to the province is provided for at the capital value plus 10 per cent. The proposed depreciation provision is such as to accumulate and maintain a reserve amounting to 7 per cent of the capital value. No action on the proposed agreement has been reported.

NEW YORK

In his latest annual report to the Legislature of New York, Commissioner Nixon of the First District recommended the adoption of service at cost as the best solution of the acute traction problems of the New York city systems. An unsuccessful attempt was also made in 1920 to pass legislation in New York permitting any city to adopt service at cost for its local railway system.

Old Franchises Amended

In addition to the new and proposed service-at-cost franchises above outlined, it may be of passing interest to note changes which have been made in certain of the older grants that have previously been fully described.

CLEVELAND

On May 1, 1919, the Cleveland franchise was extended for a period of ten years, making its expiration date 1944 instead of 1934. This was in accordance with the original provisions of the grant under which, without such extension, the powers of regulation vested in the city would have been suspended. In 1919, also, the railway called for arbitration proceedings in an endeavor to increase the authorized rate of return from 6 per cent to 7 per cent. This increase was approved by the arbitration board, but failed of ratification by referendum vote and has not become effective.

DALLAS

In 1919 the Dallas (Tex.) franchise, of the service-at-cost form with a maximum fare limitation, was found to be yielding wholly inadequate revenues. Upon presentation of the facts to the City Commission the fare limitation was increased in 1920 from 5 cents to 6 cents. It is now being contended by the company that this limitation should be removed, as the actual cost of service is approaching 8 cents. The city so far has not shown any disposition wholly to remove the present limitation.

KANSAS CITY

Operation in Kansas City (Mo.) under a franchise providing for division of possible profits with a 5-cent fare instead of service at actual cost proved so unsuccessful under war emergency conditions that the fare limitations were removed by order of the Public Service Commission. In spite of this relief the company has been placed in the hands of receivers. The local Chamber of Commerce has undertaken an investigation of the situation with a view to working out a permanent solution. It has recommended a service-at-cost plan under which the rate of return would be 6 per cent, plus a supplementary incentive depending upon the rate of fare. Elimination of requirements for street paving, cleaning, etc., was also recommended.

DES MOINES

The franchise under which the city of Des Moines, Iowa, has been operating for a number of years, having service-at-cost features but with fare limitations, also proved unsatisfactory and receivership followed. In an effort to work out a new settlement Des Moines has recently had an appraisal made of the property for use in a real service-at-cost agreement. The ideas regarding valuation and other features of such settlement which have so far been advanced by the city have not been at all acceptable to the company, and no prompt settlement of the controversy is in prospect.

In all of the above cases it appears that difficulties have occurred on account of the fare limitations. To the extent that such limitations have been insisted upon by the city, results unsatisfactory alike to the railways and the communities have followed. Fare limitations within the range of reasonable requirements are noticeably absent from the proposed new grants, indicating that the cities are prepared to meet the cost of the service which, in the exercise of their rights, they prescribe for their own accommodation, regardless of what the necessary rate of fare may be.

Summary

A review of the foregoing outlines of action with respect to service at cost, taken or under consideration during the past two years in something over twenty cities, discloses some features of interest. Out of seven carefully developed and complete service-at-cost plans four were put into effect during this period, two were rejected upon being submitted to popular vote and one was withdrawn by the company before final action. Of the two rejected franchises, one had the hearty indorsement of the business interests and the city administration and was rejected by an exceedingly small margin, apparently on account of the fear of radical increases in fares. The other rejection was largely the result of pronounced opposition on the part of the Mayor. In neither case was the opposition based upon specific criticisms of fundamental principles of the program.

Of the dozen cities in which less complete consideration has been given to service-at-cost operation, there have been three cases of definite rejection. Of these three rejections, one was based wholly upon political grounds and was against the recommendations of an investigating commission and of business men generally. Another was apparently due to unwillingness to accept the probable higher cost of transportation which the program involved. Only in the third case of rejection was there any criticism of the principles upon which service at cost is based. In Indianapolis, after investigation of service-at-cost operations in other cities by the chairman of the State commission and other interested officials, it was agreed that none of the plans in operation or proposed provided adequate insurance against inefficient operation because of the lack of incentive for efficiency so far developed.

Because of the specific rejection of one service-at-cost plan on the grounds of lack of suitable incentive to efficient operation, and criticisms to the same effect from a number of other sources, it appears appropriate to give some consideration to this phase of the subject. Clearly if, as claimed, the result of service-at-cost operation is that the properties are managed without proper regard to reasonable limitations in wages and salaries, to the procuring of necessary supplies at lowest obtainable market prices and to the utilization of labor, materials and appliances in accordance with the best modern practice, a serious defect exists, and if this defect cannot be corrected, service at cost may not be wholly acceptable as a solution of our railway problems. If, on the other hand, a study of actual service-at-cost results shows that inefficiency has not been in evidence or that suitable incentives to prevent it are available, then this alleged defect need not be considered as vital.

In the report of the Federal Electric Railways Commission the following reference to service at cost appears:

> Generally speaking, the main criticism of this form of contract is that it tends toward inefficiency and uneconomic operation; that it contains no provision for the control of strikes or uninterrupted service, and that labor and management may co-operatively increase the cost of operation to the point where the public may be unduly burdened.

After further discussion of the subject, the commission decided that the criticisms are "more theoretical than real," and its general conclusion with reference to the matter is stated in the following language:

> We strongly recommend the principles of the service-at-cost contract, not as the only solution but as one means of solving a very difficult problem.

As opposed to this strong recommendation, consideration should be given to statements made in connection with the Indianapolis investigation referred to herewith. In its motion for withdrawal of the application to the Public Service Commission for the development of a service-at-cost plan for Indianapolis the city said:

> We have been unable to find or agree upon any plan of operation on the basis of service at cost which would furnish the incentive of private ownership in an operation of service at cost. The result of our investigations generally has been to raise a most serious question and doubt as to the wisdom of the service-at-cost plan. The inevitable tendency seems to be for the operator or company readily to accept increased cost of operation with the view that it can be passed on to the public by higher fares. Such a course results only in adding to the burden of the public.

E. C. Lewis, chairman of the Indiana commission, in an address delivered at a recent meeting of the National Municipal League in Indianapolis, made the following statement with reference to the outcome of an investigation of actual service-at-cost results which he and attorneys representing the city and the railway company had made:

> I fear that service at cost simply means that the lid is taken off. It is possible that some time in the future some workable plan incorporating incentive for efficiency and initiative will be worked out. While the commission does not pass finally on service at cost, nevertheless it seems to most of us to run contrary to human nature, which, at least in business, requires opportunities of a struggle for gain. Psychologically, the blocking out of rates which shall apply if operating expenses increase threatens to become an open invitation for laxity.

At the same meeting in Indianapolis Fielder Sanders, Street Railroad Commissioner under the Cleveland franchise, expressed contrary views, contending that, because of the unparalleled period of operation under this grant and the entire lack of special incentive for efficient operation, Cleveland should be the best possible test of alleged extravagance. Logically, Mr. Sanders holds, the test of efficiency is the rate of fare in effect to cover the cost of service. The Cleveland fare has been consistently as low as or lower than that in other cities of similar size in which fares have admittedly covered the cost of service. It has been at times contended that the fare in effect in Cleveland did not cover the entire cost of service, but, as far as operating costs and provisions for current upkeep of the property are concerned, such criticisms would not hold, at least during the past few years.

Experience in other cities has been comparatively brief, but, as far as it goes, there have been no reported charges of extravagant operation in any case with the possible exception of Cincinnati. In connection with the Indianapolis investigation, it was pointed out that fares in Cincinnati had rapidly risen to a point much higher than in Indianapolis, but only by inference could it be held that inefficiency in Cincinnati was alleged. Careful comparative studies have clearly shown that operating conditions in Cincinnati are decidedly unfavorable and necessarily involve high costs. Published reports indicate that the operations of the Cincinnati railway have had uniformly careful attention and the closest scrutiny from both city and company officials. The inference is, therefore, fairly drawn that the menace of inefficiency due to lack of incentive is, as stated by the Federal Electric Railways Commission, "more theoretical than real."

TREND TOWARD INCENTIVE FEATURES

Notwithstanding this conclusion, a noticeable number of new franchises have included incentive features. Of the four complete programs which became effective during the past two years one contained a provision for increased rate of return when low fares were maintained. Of the three complete drafts which were either rejected or withdrawn, two contained similar incentive clauses. Among the other cities in which service at cost has been discussed at least two of the tentative programs included incentive features. This indicates a fairly definite feeling that incentive is desirable, and there is undoubted truth in the contention that the hope of reward is conducive to increased alertness. The whole history of business activities is corroborative of this view. It has been claimed by certain critics of service at cost that an incentive provision converts it into a cost-plus proposition. If such were the result, the purpose of such a provision would be defeated and it should be abandoned. The real purpose of an incentive clause is so to increase efficiency of operation that the investors may share in the resultant saving in service cost and fares may also be reduced below those prevailing without such incentive.

An examination of the incentive clauses so far provided discloses very few which are directly effective under present conditions. The operating bonus included in the Montreal grant undoubtedly encourages careful operation and will continue to do so unless the annual allowances are so closely adjusted by the Tramways Commission as ultimately to discourage the hope of obtaining the bonus. In other franchises the incentive is based upon the rate of fare on the assumption that more economical operation will produce lower fares, which, in turn, will yield a higher return for the investors. Recent increases in operating costs have necessitated fares so high that no supplementary returns have been available, and unless or until operating costs are substantially reduced the effectiveness of established incentive provisions will be negligible.

It has been pointed out that, under widely varying costs of service, the incentive provision really operates as a penalty, because, when operating costs are high, money costs are correspondingly high, whereas investors should have a higher return instead of the lower one which is actually available under the operation of the established incentive provisions. And the reverse of this proposition is equally true, *i.e.*, that when operating costs and money rates are low the supplementary return may not be needed adequately to compensate the investors in the enterprise.

It appears, therefore, that some different form of incentive should be devised if an incentive is really desirable. In connection with one of the recently rejected service-at-cost plans an interesting provision was drafted which appears to have some merit. It was rejected in part because of its obvious complications. This incentive provision was based upon the assumption that railway costs of service increase substantially in proportion to costs in other productive industries, and that if some measure of such other costs can be established the relation between the two costs might be made the basis of a supplementary return to electric railway owners. The difficulties of establishing a measure of general costs in industry are obvious. The most logical basis appears to be the weighted average wholesale price of commodities as represented by the index numbers regularly determined by the United States Bureau of Labor Statistics. Before the recent war this index number was fixed at 100. At that time a 5-cent fare was practically universal on electric railways, and no one will contend that such a fare was unreasonably profitable. The ratio between the wholesale index number in 1914 and the prevailing cash fare in cents was 20 to 1. Since 1914 the wholesale index number has increased more than 100 per cent. Only a negligible number of street railway fares, if any, have increased in proportion. The lower the fares could be kept in proportion to this index number the more efficient railway operation would appear to be. If, for example, with a wholesale index number of 210, which is not far from that now prevailing, a 7-cent fare is maintained, a ratio of 30 to 1 exists instead of 20 to 1, which prevailed before the war. In the proposed draft on this basis, above referred to, a supplementary return of 1 per cent was authorized when the ratio of wholesale index number to average fare was 20 to 1, or lower. It became zero with a ratio of 30 to 1, or higher, and was uniformily variable for the ten steps between these two limits.

The complications of an incentive provision of this particular form may be prohibitive, but if a workable and readily understood incentive plan embodying the principles stated could be developed it would appear to have advantages in logic and effectiveness over any of the incentives so far offered.

In the absence of an effective feature of this kind service at cost has so far been generally successful in maintaining good service and credit and in avoiding receiverships and local controversies, which are detrimental to communities as well as railways. The delays incident to prolonged investigations by public service commissions or other regulatory authorities or court proceedings have also been avoided. This feature alone may more than offset any slight disadvantages otherwise accruing to service-at-cost cities. It is not clear that such disadvantages should be substantially greater under service-at-cost operation than under equally effective but less prompt regulation on the part of public service commissions.

Status of Heavy Traction Abroad

In All Countries Where Coal Is Scarce, and Especially Where Water Power Is Plentiful, Active Planning for Railway Electrification Is Under Way — Switzerland and Italy Are Naturally Among the Leaders, but France and Other European Countries, with Great Britain and Her Colonies, Are Not Far Behind

THE world electrification situation is not favorable for statistical analysis because the most interesting phases are still in the future and subject to much modification. At the same time the annual statistical issue of the ELECTRIC RAILWAY JOURNAL is an appropriate place in which to set down some of the plans which are being made and to point out the tendencies which these plans show. This article represents an attempt to do these things, although it is not intended to be comprehensive or exhaustive. It does not mention many electrifications which may seem to some to be important and it does not treat the situations in the several countries in a uniform fashion.

The article does, however, draw from a number of authoritative sources some of the latest information available as to the planning of the several countries which will profit greatly by electrification. Probably by the end of this year there will be much to record of the ways in which these plans are being carried to fulfillment.

Great Britain and the Colonies

Electrification Has Made Some Progress and Plans Are Being Made, but Much Depends Upon the Status of the Railways Still Undetermined

DOWN to the present time there are in all thirteen examples of conversion of steam railways in England to electric traction. This is apart from the London "tube" railways which were built as electric lines. Out of the thirteen, four are small undertakings which may be passed over by naming them, the East London Railway, the Hammersmith & City Railway, the Mersey Railway and the Morecombe & Heysham branch of the Midland Railway.

Coming to more important undertakings, it may be noted generally that the conversion was carried out to enable the lines to cope more successfully with heavy passenger traffic and to develop more of it in extra suburban areas. As regards parts of the lines in London which are underground, there was also the great advantage of getting rid of the fumes from steam locomotives. The result has been that traffic has grown so that sometimes it is almost overwhelming on certain routes. Electric traction is largely confined to passenger service. On those lines which also give freight service steam locomotives are still used.

LONDON WAS A PIONEER IN HEAVY TRACTION

The first two steam railways in London to be converted for electric operation were the Metropolitan District and the Metropolitan Railways. Both began electric working in 1905. The former has a route length of about 27 miles, but with its connections over which it runs the length is 41 miles, or more than 80 miles of track. This railway runs underground east and west through the heart of London, with several branches in the western suburbs. In the East End it joins onto the Tilbury & Southend Railway, and its central section also forms part of the Inner Circle, the rest of which is owned by the Metropolitan Railway. A third-rail, positive conductor carries current at 600 volts, and a fourth rail, also insulated from earth, forms the return. Automatic interlocking signaling, supplemented by automatic train stops, permits a train service with less than two-minute headway to be given during the busy hours. Where the traffic is heaviest there is unfortunately only double track. With certain exceptions, all trains are on the multiple-unit system. About 240 motor cars and a like number of trailers are owned, each of the former being equipped with two 200-hp. motors. In addition, the company has six electric locomotives, each having four motors of 240-hp. capacity each. These locomotives are used for hauling over the company's lines through trains for Southend, 40 miles away on the coast. Steam locomotives take these trains when beyond the District Company's area.

STEAM ROADS GRADUALLY ADOPTING ELECTRIC TRACTION

The Metropolitan Railway owns the northern half of the Inner Circle and a main line with branches stretching out northwestward into the country. Only the lines in and near London have been electrified, the route length so treated extending to 26 miles, giving 59 miles of single track. The electric equipment is the same as that of the District Railway. There are some 160 motor cars and 250 trailers, each of the former having four 200-hp. motors. For some of the longer trips electric locomotives are used to haul ordinary railway rolling stock. The company owns twenty such locomotives, and each is fitted with four 200-hp. motors.

Electric traction began on one of the suburban lines of the London, Brighton & South Coast Railway about the end of 1909, and it was gradually extended to the other suburban lines until the war put a stop to further work. Some 22 miles of route, involving 70 miles of track, are operating electrically. This is the only example in England, apart from the short Morecombe line already mentioned, of single-phase traction. The voltage used is 6,700 and the frequency 25 cycles per second. Overhead contact construction is, of course, used.

The second of the big railway companies running out of London to adopt electric traction for its suburban service was the London & North Western, its first electric section starting in 1914. It took over and converted the North London Railway (steam), which serves the city and the region north of the metropolis and connects with the North Western's main line. This railway built two additional tracks electrically equipped alongside its main line all the way to Watford, some 20 miles out, and began an expensive widening involving additional tunnels in North London to bring the electric service right into its London terminus at Euston. The last-mentioned work, tied up by the war, is not yet completed.

The Baker Street & Waterloo Railway Company in 1917 extended its tube railway northward to a junction with the North Western near Willesden, and through electric trains are run from it on to Watford. When the scheme is complete North Western suburban passengers will have a choice of three routes into or out of London. The electric zone extends to 41 miles of route with 80 miles of track. The equipment is similar to the other underground railways, and multiple-unit trains are run throughout.

The last electrification scheme carried out in the London area was that of the suburban lines of the London & South Western Railway. The first section began working electrically in 1915, and despite difficulties arising out of the war the work of conversion was continued until all the routes for a distance of more than 10 miles out of the metropolis were equipped. The length of route so dealt with is 49 miles, involving 150 miles of track. Unlike most of the electric railways in the district, this one uses no fourth rail negative conductor, the track rails forming the return. The unit train consists of three coaches—heavy compartment rolling stock with cross-seats as on the steam lines. The horsepower of the motors per train is about 1,100. When required, two units are coupled to make a six-car train. About 300 ordinary steam railway carriages have been converted for the electric service. It should be understood that only some of the numerous tracks on the main line out of Waterloo terminus have been electrified, the long-distance steam trains running over the others.

SOME ELECTRIFICATION AWAY FROM LONDON

There are only two important examples of steam railway electrification in the provinces, one being parts of the system of the Lancashire & Yorkshire Railway and the other the Newcastle suburban and Tyneside lines of the North Eastern Railway. In regard to the former, the start was made by the opening for electric service in 1904 of the main line from Liverpool to Southport. This was the first example in the country of something like a main electric railway with stations at considerable distances apart and consequent high speeds. It is on the ordinary third-rail, 600-volt, direct-current system and multiple-unit trains are used throughout. Several branch lines were afterward electrified, and more recently the railway made a new departure by equipping its Manchester-Bury section, comprising some 27 miles of track, with protected side-contact third-rail conductor carrying direct current at 1,200 volts. This is the first thing of the sort in England and it has proved highly satisfactory. In all about 60 miles of route, or 120 miles of track, of the Lancashire & Yorkshire Railway is working electrically. The motors aggregate 800 hp. per motor car, and some 200 motor and trail cars are in use.

The Newcastle local lines of the North Eastern Railway were electrified in 1904, and have a route length of 35 miles, with 82 miles of track. The usual third-rail system is employed. The multiple-unit trains have in all about seventy motor cars (each with two 150-hp. motors) and sixty trail cars.

The North Eastern Railway in 1915 electrified its Shildon to Newport (Middlesbrough) mineral railway, 19 miles long, with overhead contact conductors and 1,500 volts direct current. Electric locomotives are used for hauling the coal trains from the mines down to the port and bringing them back empty. This is the only example of the kind in England.

In regard to plans for the future, there is no prospect of any railway in Great Britain carrying out any electrification until the status of the railways is defined. At present they are still under government control and their finances are not healthy. The control is to come to an end in August next and what will be the conditions after that it is hard to say. Large sums are in dispute between the companies and the government under various war agreements as to guaranteed receipts, maintenance, etc. No capital can be raised for railway purposes until the future is clearer. Besides that, the high cost of equipment at present favors delay.

Looking forward, the directors of the London, Brighton & South Coast Railway have submitted for the approval of the Minister of Transport a complete scheme for the electrification of the great bulk of their system, including the main line to Brighton. The single-phase system will be used as on the existing electric lines of the same company. Developments on other railways are likely to be carried out on the direct-current system at 1,500 volts, as recommended by the Ministry's advisory committee. The North Eastern Railway directors a year or more ago approved in principle the conversion of their main line between York and Newcastle, a distance of 80 miles, and of a loop between Northallerton and Stockton-on-Tees, 31 miles long. The York-Newcastle part is specially important, because the east coast expresses between London and Scotland travel over it, and to preserve if not improve the speed of these trains the electric locomotives will have to be capable of making 60 or 70 m.p.h.

The London & South Western Railway announced not long ago that its project of further electrification is hung up pending better times. The proposal is to extend electric traction as far out as Guildford on the main line and to convert also various country branch lines. This involves 45 miles of route, or 100 miles of track, in addition to the lines already electrified.

The Midland Railway is under an obligation to electrify its Tilbury and Southend section, some 40 miles long, but there are no immediate prospects. The Great Eastern Railway directors have spoken for years of the necessity of converting their London suburban lines, some of which carry probably the heaviest steam train passenger traffic in the world. A proposal is being made for the development of a great water power among the mountains of Scotland. Should this come about, it would probably lead to the electrification of the Highland Railway from Perth to Inverness. A possible development of a great tidal water power on the estuary of the River Severn, just suggested by the Ministry of Transport, might lead to considerable railway electrification.

BRITISH DOMINIONS LOOKING TO ELECTRIC TRACTION

The most important railway electrification work in the British dominions overseas is the conversion of the whole suburban railway system of Melbourne, Australia. These railways belong to the state, and so in spite of difficulties arising out of the war the work was gradually pushed forward. The first section began running electrically in 1919, and when all is complete the track mileage working electrically will be 335, mostly double-track, but in some places four and six-track. Direct current at 1,500 volts is used on overhead wire conductors, and multiple-unit trains are operated.

The other notable electrification is that of the Mount Royal tunnel lines in Canada, with which the readers of the ELECTRIC RAILWAY JOURNAL are familiar.

As to the future, the biggest thing in immediate prospect is the electrification of the South African State Railways. A beginning is to be made with the Cape Town-Simons Town suburban line and the section of the Natal main line from Durban to Pietermaritzburg. It is proposed to use direct current at 3,000 volts. The former line does a suburban passenger business, while the latter carries main-line traffic, both passenger and freight. Both have already reached their capacity under steam traction. The estimated cost of conversion and complete equipment of the Cape Town-Simons Town line, including a power station, is £1,269,000, while for the Natal line, including power station, locomotives, etc., the figure is £2,033,000.

Contracts have also been let for an electric railway 8 miles long, mostly in tunnel, through the mountains in the South Island of New Zealand. The line will connect the existing steam railways east and west of the mountain range. Direct current at 1,500 volts with overhead conductors will be used. The ruling gradient is 1 in 33, and the highest point on the line is 2,400 ft. above sea level.

France Planning Big Coal Saving by Electrification

Three of the Large Railway Systems Will Proceed to Adopt New Motive Power as Soon as Governmental and Financial Restrictions Are Removed

THE necessity for electrification of railways in France, while not as pressing as in some other European countries, is nevertheless receiving careful attention by the government and the Midi, Orleans and Paris-Lyons-Mediterranean railway systems. Utilization of water power, with consequent coal saving, is the primary purpose in the electrification. The whole matter is under consideration by a committee bearing the title "Comité d'études pour électrification des reseaux d'interêt géneral." This contains representatives of the six large railway systems of the country and of related industries.

GOVERNMENT ANXIOUS TO CONSERVE POWER RESOURCES

The electrification committee comprises two subcommittees, one of which was commissioned to study the plans submitted by the Midi, Orleans and P-L-M Railways, the other being especially charged to study electric traction systems in service with special reference to standardizing on a single system if possible. The latter sub-committee studied operating systems in Switzerland, Italy and the United States. Its complete report has not as yet become available, but what is understood to be its substance appeared in the *Journal Officiel* in 1919. The preference appears to be for high-voltage direct current for a unified system for France, with 50-cycle transmission.*

Among other considerations leading to the preference for this particular variety of current and voltage were the fear by the government of inductive interference between railway and intelligence-transmission lines, and desire for ability to use third rail and rotary converters, thus limiting the available voltage. It is interesting to note that the French preferences in these particulars coincide with those of their British confrères.

The electrification situation in France was depicted by M. Parodi, chief engineer of electric service of the Compagnie d'Orleans in an article in the January, 1920, issue of the *Revue Generale des Chemins de fer et des Tramways.* He said that the wealth of the country in hydraulic resources, about 8,000,000 hp., will be developed as rapidly as possible. In 1913 the coal consumption was 66,000,000 tons while the production was less than two-thirds this amount. Of the total consumption the railways use nearly 8,000,000 tons. In a dozen years the deficit will probably be from 40,000,000 to 45,000,000 tons including the consumption in Alsace-Lorraine and the normal increase in requirements. By 1932 the railway consumption might reach 13,000,000 tons. The electrification of 5,100 miles of line, including the 93 miles already electrified by the Midi Railway, will reduce the coal consumption by more than 2,000,000 tons.

LARGE ELECTRIFICATION MILEAGES IN VIEW

The electrification projects which are in part now being carried out comprise the following:

The Midi system proposes to electrify 1,865 miles, constituting the whole of the system excepting the lines in the level regions around Bordeaux and Cette and the branches of these lines.

The Orleans system proposes also 1,865 miles of electrification in the Central Massis, from Chateauroux to Montauban, from Limoges to Gannat, and from Clermont to Tulle, with branches.

The Paris-Lyons-Mediterranean system proposes to electrify 1,367 miles commencing with the lines from Nimes to Langdome, from Culoz to Modane, from Lyons to Geneva, including the heavy-traffic lines from Lyons to Marseilles, from Marseilles to Vintimille, from Tarascon to Cette, etc.

During the latter part of 1920 plans for considerable electrification have received governmental sanction and the Midi Railway is reported to have placed contracts for hydraulic machinery and electric locomotives, while the Orleans Company is understood to have plans for the immediate carrying out of its program, beginning with the Paris terminal. Power for the Paris end of the system will be secured from the Paris super-power system, while the company will produce its own power hydraulically in its mountainous sections where power will probably also be available for sale.

Belgium Is a Logical Field for Electrification

This Small Country Provides a Field for a Vast Interurban Passenger System Plus One Permitting the Handling of Large Quantities of Freight

THE scheme for the electrification of the State Railways of Belgium is not so far advanced as some reports during the past year seemed to indicate. The fact is that the Belgian government is being advised by a small committee of railway engineers who are preparing a preliminary scheme which will be submitted to the commission appointed by the Belgian Government to report on the electrification of the railways. The commission consists of manufacturers, bankers, heads of railway departments and members of the various Belgian ministries, and it also includes French and British engineers. The president of the commission is Baron Ancion, and Sir Philip Dawson, so well known as a consulting electric railway engineer in England, is one of the vice-presidents. Many meetings have been held and reports made, and at present the commission is waiting for the preliminary report above referred to from the committee of engineers. No electrification contracts will be let meanwhile.

However, Belgian railways ought to be electrified promptly, for the reasons listed by Sir Philip in his Liége address abstracted in the issue of this paper for Dec. 4, 1920, page 1151. He said in this connection: "As to Belgium, in view of its relatively small area, its dense population, its frugal and industrious people, its well-developed metallurgical and other industries, its excellent railroad systems and its fuel resources, its railways can be compared with a vast suburban system. If there is a case where a complete electrification would be justified, that case presents itself in Belgium. Here it is necessary to study fundamentally the electrification of the entire system, in such a way that the sections which are to be electrified now will form a homogeneous part of the whole from the points of view both of traction and distribution. Such a study will be costly, but when millions of francs are involved it seems worth the investment of some hundreds of thousands of francs so as to insure the obtaining of the best possible financial results."

In an article appearing recently in *l'Echo de la Bourse*, Brussels, an outline of a plan for the partial electrification of the State Railways is given. It comprises three phases: (1) Complete electrification of the Brussels-Antwerp line; (2) electrification of the Luxembourg line and connections; (3) electrification of various trunk lines radiating from Brussels. For this work direct current is favored, but a decision as to voltage, 1,500 or 3,000, had not been reached at the time the article was written.

Electrification Largely Prospective in Spain

Several Excellent Opportunities for Conservation, However, Are Recognized—People Wakening to Necessity for Conserving Fuel

THE heavy traction field in Spain is practically untouched. There are, however, several prospective electrifications and the people are wakening to the necessity for increasing track capacity and conserving fuel. One of the most imminent electrifications is that of the Pajares grade on the Norte Railway in the north of Spain. This line connects the north coast at Gijon and the coal mines on the north slope of the mountains with the inland cities. The line in question is one about 39 miles long and on a grade which is 2 per cent over a large part. The line is very crooked and has many tunnels, with a maximum length of 2 miles. It is single track and the light rolling stock and light track construction make it very difficult to operate freight trains of any considerable weight; in fact, the maximum train with two locomotives is 600 metric tons. It is hoped by the electrification of this grade to make a very great increase in the capacity.

Another very important project is that of the Las Arenas Railway at Bilbao, an important seaport. This is a meter-gage railway, but has fairly heavy suburban traffic. It will probably be electrified in the near future. The railway will probably use 1,500 volts direct current, as against 3,000 volts for the Norte. The next most active prospects are at Barcelona, where there are several railways that are considering electrification seriously.

There is an abundance of water power in the north of Spain, especially at Barcelona, where there are several transmission lines with a considerable amount of power available. Barcelona is an up-to-date city and very wide awake. The inhabitants are known as the Yankees of Spain. There are one or two short electric railways there at this time, and others will soon follow.

The high cost of coal will greatly accelerate railway electrification in Spain, as well as in the other countries of Europe. The financial situation, however, is very much better, since the rate of exchange for Spain is so much better than in France and some of the other countries.

The railways of Spain seem to be, for many years at least, doomed to the use of very light trains, owing to the weak, almost flimsy, drawbar and buffer construction, as well as to the low permissible wheel loads. The cross ties in the track are spaced so far apart that the very light load of 15 tons per axle is scarcely permissible, even though an 80-lb. rail is used. The drawbars are being gradually strengthened, but it will be many years before they are able to handle as much as 20 tons pull.

Switzerland Is the Focus of Electrification Interest

Interest Centers in Lucerne-Chiasso Line, Which Includes St. Gotthard Tunnel, Now in Electric Operation—Federal Railways Have Comprehensive Program

IN OTHER countries there is much discussion of electrification; in Switzerland there is "something doing." During the past few months (since July 1) operation through the St. Gotthard tunnel has been by electric locomotives, power being drawn from the Lake Ritom hydro-electric plant in which four 12,000-hp. generator units produce power at 15,000 volts. This is part of a general program adopted over two years ago.

This country is one in which general railway electrification is a virtual necessity. The country depends upon its neighbors for coal, which now commands a prohibitive price, while it has abundant water power. Ordinarily about 600,000 tons of coal is required per annum by the railways, which can be entirely saved by the development of but a fraction of the available 3,000,000 hp. of water power. Fortunately the Swiss franc is worth in exchange nearly its par value so that the financial aspect of electrification work is not unfavorable.

A large part of the railway mileage of Switzerland (about 2,800 miles) is owned and operated by the federal government. After long study, and experience with both single-phase and three-phase, the Federal Railways in 1916 adopted 15-cycle, 15,000-volt single phase as standard, although three-phase will be retained on the Simplon tunnel line on account of its connection with the Italian lines on which three-phase is standard. The Federal Railways have adopted a program of electrification in three stages. The first includes 700 miles most favorably located for the purpose, with a corresponding hydraulic development of 76,000 hp. This will reduce the coal consumption by one-half. The second includes about 375 miles of light-traffic lines which are also favorably located, while the third includes the remainder which is left for future consideration.

To return to the St. Gotthard line; a section of the line from Lucerne to Chiasso, a distance of 140 miles. The tunnel is in electric operation, and the section from Erstfeld to Bellinzona is practically complete. On this section are grades up to 2.7 per cent. The Bellinzona-Chiasso section, connecting with the Italian lines, should be finished during 1921, and shortly thereafter the Erstfeld-Lucerne section.

During the war 33 miles of line between Brigue and Sion was temporarily equipped with three-phase, on account of the availability of power from the Simplon. It will later be made single-phase. The nearly 20 miles from Berne to Thun was also electrified with single-phase in 1918.

The Ritom power plant is of interest on account of the high head under which the Pelton impulse water wheels operate, over 2,600 ft. The depth of Lake Ritom has been increased by a 23-ft. dam, and the conduit draws off the water 100 ft. below the dam crest. The available storage capacity is estimated at 900,000,000 cu.ft., more or less.

The St. Gotthard line will also be supplied with power from a plant, now building, at Amsteg, just north of the tunnel. This is located on the Reuss River, but there will be only a small water storage capacity. The Amsteg and Ritom plants will be operated in conjunction, utilizing the different capacity characteristics of the two. The Amsteg plant will run continuously, utilizing the full capacity of the river. The Ritom plant will care for peak loads, and will in general be shut down in summer to allow the lake to fill.

Latin America Not Idle

Electrification Work Is Actually Under Way in Brazil and Cuba—Direct Current Is Employed in Both Cases

TWO interesting high-voltage direct current electrifications are being carried out at present in Brazil and Cuba; the former a part of the Paulista Railway between Jundiahy and Campinas, the latter the Hershey Cuban Railway on the north coast of the island between Matanzas and Havana.

On the Brazilian road 3,000 volts will be used on the contact line. Ten 100-ton freight and six 120-ton passenger locomotives will be installed at once on the 28 miles of route now being electrified. This is a double-track line and the single-track equivalent in the electrified zone is 76 miles.

The locomotives to be furnished by the General Electric Company are similar in general construction to those in use on the Butte, Anaconda & Pacific Railway, but with the regenerative feature. The Westinghouse locomotives differ somewhat in wheel arrangement, but essentially they are of the same general type.

The Brazilian railway officials are looking forward with keen anticipation to the arrival of the new motive power which they believe will find operating conditions congenial on this high-class, well-maintained road.

On the Hershey Cuban Railway the voltage will be only 1,200, but overhead contact construction will be used. Electric locomotives will be used for freight service, and seven 60-ton machines will furnish the initial equipment. Multiple-unit cars will be employed in the passenger service. This electrification will ultimately involve a single-track equivalent mileage of 80.

The power distribution equipment of the Hershey Cuban Railway is of interest in that for the outlying substations automatic control will be used.

Considerable popular interest attaches to the Hershey Cuban Railway in the fact that the owner is the well-known chocolate manufacturer, and a considerable part of its business consists in transporting sugar cane to Hershey Centrale, an important sugar center.

Italy Clings to Three-Phase

Although Not Oblivious to Developments in Other Systems, This Country Will Extend Electrification Along Established Lines to Avoid Delays

ITALY has for many years pursued a consistent policy of electrification, although the actual mileage of line electrically equipped is not great, say 280 miles out of a total of 8,500. However, a considerable program has been laid out, both for the state and private railways, and much construction is actually under way. The government offers subsidies to private companies for the construction of railways, with extra allowances if the lines are electrified. The subsidies have recently been increased to render them more attractive, as those previously offered were not stimulating expansion to the extent desired. Provision is made by which the state can take over the permanent way and structures of the subsidized railways under conditions which are entirely fair. On the new lines now under construction or projected about two-fifths of the mileage will be equipped for electrical operation.

The Italian State Railways have long favored three-phase locomotives, operating at 16 cycles, a very low frequency. The latest type of locomotive was commissioned during the war and gave a good account of itself. A summary of the features of this type was given in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 4, 1917, page 189. Eighteen of this type of locomotive were purchased. The locomotive is designed for four speeds up to 62 m.p.h. The four-speed arrangement was selected to provide the low speed necessary on certain parts of the lines over which the machines had to operate and to minimize the rheostatic losses in passing from speed to speed.

For power supply the railways depend largely upon the power plants of the cities near the electrified lines. The situation is complicated by the low frequency of the railway power, the industrial frequency being 42 cycles. Where a power plant furnishes railway power it must have extra generators, which are sometimes mounted on the same shafts as the industrial machines. Frequency changers are apparently not used. Experiments will be conducted by the State Railways with 42-cycle current for use on the locomotives and also with the high-voltage direct current.

However, the program will be carried out as planned using three-phase and it is understood that 1,200 miles of line or more will be electrified in the near future.

The plan for electrification, as presented by the Railway Administration to the Minister of Public Works, was reported by Vice-Consul James J. Murphy, Jr., from Genoa, and printed in *Commerce Reports* for Sept. 3, 1920, page 1098.

It covers four groups as follows:

1. Lines to be electrified at once by the Railway Administration: Ovada to Sampierdarena, Genoa to Spezia, Florence to Pistoia to Bologna, Bologna to Faenza to Florence, Orte to Foligno, Rome to Naples with branches Carano to Nettuno and Piperno to Terrarina, Naples to Avezzano to Sulmona, Naples to Salerno to Gragnano, Savona to Altare to San Guiseppe, Brenner to Verona, Trieste to Piedirolde with branch Prevancina to Aidustera, Chiasso to Monza to Milan. The length of the above totals nearly 830 miles.

2. Lines to be electrified as above but in the second period: Alessandria to Ovada, Spezia to Pisa, Spezia to Parma, Florence to Orte to Rome, Foligno to Falconara

to Faenza, Sulmona to Pescara to Falconara, Cesa to Mondovi to Forsano to Trofarello, Trieste to Monfalcone with branch to Nabresina Operina, Milan to Voghera. Total length of these lines, nearly 700 miles.

3. Lines on which new systems of electric traction will be tried: Rome to Anzio, Rome to Tivoli (3-phase with industrial frequency); Messina to Catania (high-voltage direct current); Cagliari to Monteponi (standard-voltage direct current). The combined length of these lines is about 160 miles.

4. Lines which will be electrified under private management: Savona to Ventimiglia, Turin to Venice, Milan to Bologna to Padua, Bologna to Vernona, Mestre to Primolano to Trent, Florence to Pisa, Benevento to Salerno, Benevento to Foggia, Salerno to Battipaglia to Paola, Mestre to Portogruaro to Monfalcone. The lines have a total length of about 1,080 miles.

The grand total of all of the above lines is nearly 2,770 miles.

The plan comprehends that the lines south of the Pisa-Florence-Faenza line in the first and second groups will comprise power plants that can be operated at a frequency higher than 16 cycles in case the Rome-Anzio experiment with industrial frequency is a success.

American Engineering Council at Work

Active Steps Taken to Assume Work that Was Started by Engineering Council — Non-Member Societies Will Be Asked to Co-operate

HERBERT HOOVER, president of the Federated American Engineering Societies, presided at the executive board meeting of the American Engineering Council of that organization, held in New York on Friday, Dec. 17. Every one of the twenty-four members of the council was present with the exception of A. M. Greene.

The president appointed the following standing committees:

PROCEDURE
Calvert Townley, chairman
Herbert Hoover, ex officio
J. Parke Channing
W. E. Rolfe
L. W. Wallace
D. S. Kimball
L. P. Alford

CONSTITUTION AND BY-LAWS
W. B. Powell, chairman
C. F. Scott
D. S. Kimball

PUBLICITY AND PUBLICATIONS
L. P. Alford, chairman
H. W. Buck
H. E. Howe

MEMBERSHIP AND REPRESENTATION
J. F. Oberlin, chairman
L. W. Wallace
A. S. Dwight

FINANCE
William McClellan, chairman
E. Ludlow
C. Townley
L. W. Wallace, ex officio

PUBLIC AFFAIRS
J. Parke Channing, chairman
Fred J. Miller
L. B. Stillwell

In discussing the program of the council immediately ahead, Mr. Hoover stated that he had called engineers together in various cities he had visited lately and that he found that the general desire of engineers everywhere was to join in the federation movement, but that the general trend was for territorial organization, as distinguished from national organization. One of the stumbling blocks in the way of these territorial organizations joining the national organizations was the question of dues. Another complexity was that individuals hold memberships in more than one society. This question was discussed and referred to a special committee, which will include the six district delegates.

As a step forward in co-ordinating various inter-society activities already established, the necessary action was taken to make it possible for certain of the activities of Engineering Council to be taken over by the new organization. As soon as the United Engineering Societies have passed officially upon the proposed action of Engineering Council to transfer and continue the work of Engineering Council's committees which have not yet completed their work the president will appoint the necessary committees of American Engineering Council to take over this work. At the meeting of Engineering Council held in Washington, there was harmony of all the member societies in Engineering Council to this end. In this connection, action was taken to amend the by-laws so that members of committees can be selected from societies other than those at present members of the federation. Civil engineers and engineers in other bodies not at present affiliated with the Federated American Engineering Societies can, because of this action, co-operate in the committee work.

The four so-called founder societies in addition have been associated in a common employment service and American Engineering Council has offered to take over this service as a part of its function.

American Engineering Council voted not to affiliate with the United States Chamber of Commerce, but it expressed its desire to co-operate with the Chamber at any time and give advice on any question that may arise. It was the thought of the meeting that the council could make its best contribution to the public by acting independently.

The council authorized the appropriation of $1,000 as an initial fund to carry on publicity work, and the committee on publicity and publications was given authority to set up a board of engineering editors.

A special committee reported on candidates for permanent executive secretary of the organization, but no final action was taken at the meeting.

There was a general feeling expressed that the meetings of the board should be held at different centers, and the place of the next meeting, which will be held Feb. 11, was left to the discretion of the president.

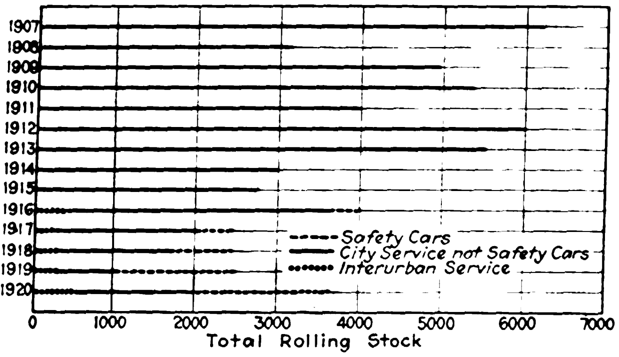
Safety Car Recommended to English Tramway Managers

TO ENGLISH tramway managers the *Electric Railway and Tramway Journal* of Nov. 12, 1920, recommends for earnest consideration J. C. Thirlwall's article on the safety car which appeared in the ELECTRIC RAILWAY JOURNAL of Oct. 2, 1920. It points out the fact that in spite of the distinct success and popularity in this country of one-man cars not a single British system has considered their adoption even as a partial solution of operating difficulties. Their backwardness in failing to realize the economies resulting from their lightness and one-man operation can be attributed, perhaps, to their ultra-conservatism. However, it cannot be overlooked that circumstances which are necessary for the success of the safety car may not be existent in England yet and their wide use here does not give proof of their permanent utility.

New Rolling Stock Ordered in 1920

Approximately 50 per Cent More Cars Ordered than During the Year Previous—Safety Cars Still Represent the Largest Proportion of the Total, 113 Companies Ordering 1,699 Safety Cars—Both Urban and Interurban Passenger Cars Increase by Large Percentages—Freight and Express Cars Nearly Treble

THE statistics in the following tables regarding new cars and locomotives ordered during 1920 by the electric railway companies of the United States and Canada indicate the need on many lines for additional equipment to care for existing traffic. A step was made last year to acquire additional rolling stock. In 1919 the new rolling stock ordered was 2,447 cars. The results this year show a much more promising future, since the new cars and locomotives ordered have reached a total of 3,598 cars, which is 1,151 more than last year, or a percentage increase of 47.5 per cent.



NEW CARS AND LOCOMOTIVES ORDERED BY YEARS

In this chart the division by city and interurban cars is not made prior to 1916.

TABLE I—NEW ROLLING STOCK ORDERED SINCE 1907

Year	Passenger Cars City	Passenger Cars Interurban	Freight and Misc Cars	Electric Locomotives	Total
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	605	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598

(a) Included in "Freight and Miscellaneous Cars."

The main reason for this large increase in car orders is due to the more extensive use of the one-man car. Many companies, and especially is this true west of the Mississippi River, are supplanting their equipment with these lighter cars, which are less expensive to operate and to maintain. Although many companies which had previously ordered one-man cars enlarged their equipment by the purchase of more, the number of new companies ordering them is very noticeable. The number of companies this year which invested in this type of car is 113.

These 113 companies, which are approximately 13.5 per cent of all those in the United States and Canada, purchased 1,699 one-man cars. This is quite a gain over last year and may be assumed to prove the fact that the light weight one-man car has been able to compete with the jitney. As is shown in the chart accompanying this article, the light weight one-man cars were practically unknown until 1916, when only 187 of these cars were ordered. The number ordered during 1920 is nearly ten times as many as in 1916. Most of the one-man cars were ordered in the United States, only thirty of the total being ordered by Canadian companies. The types of cars are divided into motor or trailer, two-man passenger, city or interurban, and freight and express cars, city or interurban, besides the one-man cars. Of the total number the latter occupy the most prominent position, with a total of 1,699 cars, or approximately 47.5 per cent of all the cars ordered during the past year. While the percentage of one-man cars to the total is 9 per cent less than in 1919, this fact does not characterize the growth as much as the actual increase of 316 cars.

In order to show the progress of the industry at a glance a table has been prepared showing the rolling stock ordered each year since 1907, divided into four types of cars: passenger cars, city or interurban; freight, express and miscellaneous cars, and electric locomotives. In this table passenger cars for operation in subway and on elevated structures have been taken as city passenger cars. The miscellaneous cars include service cars, as snow plows, sweepers, work cars, etc.

Due to the large increase in safety cars, which all come under the head of city passenger cars, an increase of 39 per cent will be noted in this column. At the same time the total of each of the other types of cars has likewise increased except in the use of the electric locomotives.

The electrification of steam railroads was at a standstill during 1920. An indication of this was the fact that only seventeen new electric locomotives were ordered during the year, and further, that these were mostly ordered by electric railways for switching purposes or the haulage of freight cars.

In the gathering of the data for this article questionnaires were sent to about 785 electric railway companies in the United States and replies were received from about 91 per cent of them. The remaining 9 per cent are small companies.

TABLE II—SPECIAL COMPARISONS OF NEW ROLLING STOCK ORDERED

	1920	1919	1918	1917	1916
Number of railways reporting new cars	172	160	140	182	250
Total number of cars	3,581	2,429	2,375	2,406	3,911
City Service:					
Number of safety cars	1,699	1,383	644	280	187
Number of two-man passenger motor cars*	847	635	1,068	1,316	2,731
Number of passenger trailers	343	111	130	402	128
Service cars	104	31	(a)	(a)	(a)
Total city service cars	2,993	2,160	1,842	1,998	3,046
Interurban Service:					
Number of two-man passenger motor cars	195	96	200	158	303
Number of passenger trailers	32	32	55	27	71
Number of freight and express cars	361	141	(a)	(a)	(a)
Total interurban service cars	588	269	255	185	374
Number of electric locomotives	17	18	44	49	31
Number of cars and electric locomotives built in railway companies' shops	166	165	89	281	445

*Includes motor and trailer cars for subway and elevated in New York City.
(a) Not available.

TABLE III—ROLLING STOCK ORDERED DURING 1920

New England District

	Number	Type	Over-all Length	City or Interurban	Motor or Trailer
Connecticut:					
Bristol & Plainville Tramway Co.	3	Passenger	39′ 0″	C	M
Connecticut Co. (New Haven)	20	Safety	28′ 0″	C	M
	30	Safety	27′ 10″	C	M
	6	Safety	28′ 0½″	C	M
Danbury & Bethel St. Ry.	4	Safety	39′ 0″	C	M
Maine:					
Androscoggin & Kennebec Ry. Co., Lewiston	3	Safety	28′ 0″	C	M
	10	Passenger	45′ 0″	C	M
	* 2	Snow plow	25′ 0″	C & I	M
Biddeford & Saco R.R. Co.	2	Safety	28′ 0″	C	M
Cumberland County Pwr. & Lt. Co., Portland	8	Safety	28′ 0″	C	M
	1	Snow plow	30′ 0″	I	M
	1	Snow swpr.	24′ 10″	C	M
Knox County Electric Co., Rockland	1	Passenger	28′ 0″	C	T
	1	Passenger	49′ 9″	C	M
	1	Passenger	43′ 0″	I	M
Massachusetts:					
Berkshire St. Ry. Co., Pittsfield	12	Safety	28′ 0″	C	M
Boston Elevated Railway Co.	30	Passenger	48′ 9½″	C	M
	65	Passenger	46′ 7½″	C	M
	75	Passenger	48′ 2½″	C	M
	80	Safety	28′ 0½″	C	M
	2	Snow plow	42′ 4″	C	M
	2	Snow swpr.	39′ 0″	C	M
	*1	Line car	36′ 6″	C	M
Boston & Worcester St. Ry.	1	Safety	27′ 10″	C	M
Brockton & Plymouth St. Ry. Co.	3	Safety	28′ 0″	C	M
City of Attleboro	1	Safety	27′ 10″	C	M
Eastern Mass. St. Ry. Co.	50	Safety	28′ 0½″	C	M
	29	Snow swpr.	....	C	M
Northampton St. Ry.	2	Snow swpr.	....	C	M
Springfield St. Ry. Co.	10	Safety	28′ 0″	C	M
New Hampshire:					
Laconia St. Ry. Co.	2	Safety	28′ 0″	C	M
Rhode Island:					
Newport & Providence Ry. Co.	2	Safety	28′ 0″	C	M
Vermont:					
Barre & Montpelier Trac. & Pwr. Co.	2	Safety	28′ 0″	C	M

North of the Ohio and East of the Mississippi River

	Number	Type	Over-all Length	City or Interurban	Motor or Trailer
District of Columbia:					
Washington & Old Dominion Ry.	*1	Passenger	40′ 0″	I	M
Illinois:					
Aurora, Plainfield & Joliet Ry.	1	Safety	28′ 0″	C	M
Chicago Surface Lines	10	Safety	28′ 0½″	C	M
	*51	Passenger	47′ 6″	C	T
	6	Snow swpr.	28′ 3″	C	M
Decatur Ry. & Lt. Co.	6	Safety	28′ 0½″	C	M
Illinois Traction Co. (Peoria)	40	Safety	28′ 0½″	C	M
Pekin Municipal Ry. Co.	3	Safety	28′ 0″	C	M
Rockford & Interurban Ry. Co.	12	Safety	28′ 0″	C	M
	1	Snow swpr.	....	C	M
Springfield Consolidated Ry. Co.	17	Safety	28′ 0″	C	M
Indiana:					
Gary & Hobart Traction Co.	1	Safety	28′ 0″	C	M
Indiana Rys. & Lt. Co. (Kokomo)	10	Safety	28′ 0½″	C	M
	2	Passenger	45′ 0″	I	T
	3	Work	24′ 0″	I	T
Indiana Service Corportion (Fort Wayne)	4	Freight	40′ 0″	I	T
Interstate Public Service Co.	8	Passenger	62′ 0″	I	M
	1	Passenger	50′ 0″	I	T
	15	Freight	42′ 1″	I	T
Public Utilities Co. (Evansville)	8	Safety	28′ 0″	C	M
Terre Haute, Indianapolis & Eastern Trac. Co.	10	Safety	28′ 0½″	C	M
Winona Interurban Ry. Co. (Warsaw)	* 6	Freight	36′ 0″	I	T
Maryland:					
Cumberland & Westernport Ry. (Frostburg)	1	Bag. & exp.	41′ 8″	I	M
United Rys. & Elec. Co. of Baltimore	100	Passenger	46′ 10″	C	T
	33	Safety	28′ 0½″	C	M
Michigan:					
City of Detroit Municipal Ry.	25	Safety	27′ 10″	C	M
Detroit United Rys.	12	Safety	28′ 0½″	C	M
	1	Freight	50′ 0″	I	M
Escanaba Trac. Co.	2	Passenger	45′ 0″	I	M
	1	Snow swpr.	28′ 6″	I	M
Grand Rapids Ry. Co.	19	Safety	28′ 0½″	C	M
Michigan Railroad Co. (Jackson)	20	Freight	50′ 0″	I	M
Michigan Rys. Co. (Kalamazoo)	8	Safety	27′ 9½″	C	M
Michigan United Rys. Co. (Jackson)	20	Safety	28′ 0½″	C	M
Muskegon Trac. & Lt. Co.	6	Safety	28′ 0½″	C	M
Saginaw Bay City Ry. Co.	8	Safety	28′ 0″	C	M
	20	Safety	28′ 0½″	C	M
	1	Sweeper	....	C	M
New Jersey:					
Pennsylvania—New Jersey Ry. Co. (Trenton)	7	Safety	35′ 4″	C	M
Public Service Ry. Corp. (Newark)	200	Safety	27′ 10″	C	M
	100	Passenger	49′ 9″	C	T
	15	Snow swpr.	30′ 6″	C & I	M
	15	Snow plow	40′ 8″	C & I	M
Salem & Pennsgrove Trac. Co.	6	Safety	28″ 0½″	C	M
Trenton & Mercer County Trac. Co.	40	Safety	28′ 0½″	C	M
New York:					
Binghamton Ry. Co.	‡10	Passenger	47′ 0″	C	M
City of New York Municipal Ry.	28	Safety	28′ 0½″	C	M
Empire State Railway Co.	6	Safety	27′ 10″	C	M
	3	Passenger	53′ 7″	I	M
Hudson Valley Railway Co. (Glens Falls)	2	Passenger	50′ 0″	I	M
Manhattan Bridge 3c. Line	2	Passenger	44′ 6″	C	M
New York Central R.R.	15	Passenger	69′ 5″	I	M
New York Municipal Ry. Corp.	200	Passenger	67′ 0″	C	M
Orange County Trac. Co. (Newburgh)	3	Safety	28′ 0½″	C	M
Peekskill Lt. & R.R. Co.	2	Safety	28′ 0″	C	M
	4	Safety	27′ 9½″	C	M
Poughkeepsie & Wappingers Falls Ry.	7	Safety	27′ 10″	C	M
Rochester, Lockport & Buffalo R.R. Corp.	1	Express	....	I	M
	1	Snow plow	....	C	M
Westchester St. R.R. Co. (White Plains)	6	Safety	27′ 10″	C	M
Ohio:					
Cleveland Railway Co.	50	Passenger	52′ 5½″	C	M
	50	Passenger	49′ 2″	C	T
Columbus, Delaware & Marion Elec. Co.	5	Freight	42′ 0″	I	M
Dayton & Troy Electric Ry. Co.	8	Passenger	62′ 5″	I	M
Lake Shore Electric Ry. (Cleveland)	16	Safety	28′ 0″	C	M
	15	Freight	55′ 0″	I	T
Northern Ohio Trac. & Lt. Co. (Akron)	25	Passenger	50′ 0½″	C	M
	31	Passenger	50′ 0½″	I	M
	10	Passenger	46′ 8½″	C	T
	20	Passenger	55′ 11″	I	M
	25	Safety	28′ 0½″	C	M
	3	Snow swpr.	28′ 2″	C	M
Ohio Service Co. (Coshocton)	2	Safety	28′ 0½″	C	M
Pennsylvania-Ohio Electric Co. (Youngstown)	10	Passenger	52′ 11½″	I	M
	12	Safety	28′ 0½″	C	M
Southeastern Ohio Ry. Co. (Zanesville)	1	Passenger	48′ 2″	I	M
Toledo, Fostoria & Findlay Ry. Co.	1	Freight	58′ 0″	I	M
Pennsylvania:					
Beaver Valley Trac. Co.	10	Safety	27′ 10″	C	M
Chambersburg, Greencastle & Waynesboro St. Ry.	1	Passenger	48′ 0″	I	M
Conestoga Trac. Co. (Lancaster)	2	Passenger	45′ 0″	I	M
	4	Safety	30′ 0″	C	M
Eastern Pennsylvania Rys. (Pottsville)	1	Express	41′ 8″	I	M
	10	Safety	28′ 0½″	C	M
	2	Passenger	47′ 0″	I	M
Ephrata & Lebanon St. Ry. Co.	1	Express	50′ 0″	I	M
Harrisburg Railways Co.	2	Snow swpr.	28′ 3″	C	M
Hershey Transit Co.	2	Passenger	41′ 8″	I	M
Indiana County St. Ry. Co. (Indiana)	3	Passenger	44′ 5″	I	M
Northumberland County Ry. (Sunbury)	4	Safety	28′ 0½″	C	M
Pittsburgh Rys. Co.	25	Passenger	45′ 0″	C	T
Reading Transit & Lt. Co.	25	Passenger	45′ 0″	C	M
	12	Safety	27′ 10″	C	M
	1	Dump	40′ 6″	C	M
Shamokin & Mt. Carmel Transit Co.	2	Safety	28′ 0½″	C	M
State Belt Transit Co. (Pen Argyl)	2	Passenger	47′ 0″	I	M
Susquehanna Trac. Co. (Lock Haven)	1	Safety	27′ 9½″	C	M
	1	Snow swpr.	28′ 3″	C	M
Tarentum, Breckenridge & Butler Ry.	1	Safety	28′ 0½″	C	M
Trenton, Bristol & Phila. St. Ry. Co.	6	Safety	28′ 0½″	C	M
Warren Street Railway	6	Safety	28′ 0½″	C	M
	2	Passenger	41′ 8″	I	M
	1	Snow swpr.	....	C	M
Westmoreland County Ry. (Pittsburgh)	4	Safety	28′ 0½″	C	M
West Penn Railways	*2	Express	59′ 0″	I	M
	*2	Dump	20′ 0″	I	T
Wilkes-Barre Ry. Co.	5	Passenger	48′ 0″	I	M
Woodlawn & Southern St. Ry. Co.	4	Safety	28′ 0½″	C	M
York Railways	6	Passenger	45′ 0″	I	M
	1	Swpr.	29′ 0″	C	M
Wisconsin:					
Beloit Traction Co.	2	Safety	28′ 0½″	C	M
Janesville Traction Co.	5	Safety	28′ 0″	C	M
Madison Railways Co.	8	Safety	30′ 0″	C	M
Milwaukee Elec. Ry. & Lt. Co.	40	Safety	28′ 0″	C	M
	100	One man	45′ 0″	C	M
	*2	Express	50′ 0″	I	M
	*2	Express	50′ 0″	I	T
	4	Dump.	40′ 6″	C & I	M
	8	Dump	40′ 6″	C & I	T
	4	Dump.	21′ 6″	C & I	T
	*6	Work	....	C & I	T
	8	Other types	....	C & I	T
Wisconsin Public Service Co. (Green Bay)	6	Safety	28′ 0″	C	M
Wisconsin Valley Elec. Co. (Wausau)	4	Safety	28′ 0½″	C	M

South of the Ohio and East of the Mississippi River

	Number	Type	Over-all Length	City or Interurban	Motor or Trailer
Alabama:					
Alabama Pwr. Co. (Birmingham)	4	Safety	28′ 0½″	C	M
Mobile Lt. & R R. Co.	2	Safety	28′ 0½″	C	M
	10	Safety	27′ 9½″	C	M
Montgomery Lt. & Trac. Co.	10	Safety	28′ 0″	C	M
Tuscaloosa Ry. & Utilities Co.	*1	Passenger	22′ 6″		

* Built in companies' own shops. † Rebuilt. ‡ Second hand.

TABLE III—ROLLING STOCK ORDERED DURING 1920—*CONTINUED*

	Number	Type	Over-all Length	City or Interurban	Motor or Trailer
Florida:					
Municipal Railways of St. Petersburg	8	Safety	27' 9½"	C	M
Tampa Electric Co	8	Safety	28' 0½"	C	M
Georgia:					
Athens Ry. & Elec. Co	5	Safety	28' 0½"	C	M
Atlanta Northern Ry. Co	4	Passenger	50' 6"	I	M
Columbus Railroad Co	9	Safety	28' 0½"	C	M
Georgia Ry. & Pwr. Co	23	Passenger	44' 6"	C	M
North Carolina:					
Tidewater Power Co. (Wilmington)	10	Safety	28' 0½"	C	M
South Carolina:					
Southern Public Utilities Co. (Anderson)	6	Safety	28' 0"	C	M
Virginia:					
Danville Trac. & Pwr. Co	2	Passenger	37' 0"	C	M
Virginia Ry. & Pwr. Co. (Richmond)	50	Safety	28' 0½"	C	M
West Virginia:					
Monongahela Valley Trac. Co. (Fairmont)	8	Safety	28' 9½"	C	M
	3	*Freight	30' 0"	I	M
West of the Mississippi River					
California:					
Fresno Traction Co	12	Safety	28' 0"	C	M
Los Angeles Railway Co	22	Safety	28' 0"	C	M
Municipal Ry. of San Francisco	1	Passenger	29' 0"	C	M
Pacific Elec. Ry. (Los Angeles	102	Safety	28' 0½"	C	M
	26	Passenger	47' 0"	I	M
	16	Passenger	47' 0'	I	T
Pacific Gas & Elec. Co. (Sacramento)	6	Safety	28' 0½"	C	M
San Diego Electric Railway Co	25	Safety	28' 0½"	C	M
San Francisco, Napa & Calistoga Railway	2	Passenger	58' 0"	I	M
	* 1	Passenger	35' 0"	I	M
San Francisco-Oakland Term. Rys.	25	Safety	28' 0½"	C	M
	*18	Passenger	48' 6"	C	M
	* 5	Passenger	40' 8"	I	M
San Jose Railroads	22	Safety	28' 0"	C	M
Stockton Electric Railroad Co	15	Safety	28' 0"	C	M
Colorado:					
Arkansas Valley Railway, Light & Power Co. (Pueblo)	4	Safety	27' 9½"	C	M
Iowa:					
Iowa Ry. & Lt. Co. (Cedar Rapids)	6	Safety	28' 0½"	C	M
Iowa Southern Utilities Co. (Centerville)	1	Safety	....	C	M
Waterloo, Cedar Falls & Northern Ry. Co	20	Safety	28' 0½"	C	M
Kansas:					
Topeka Railway Co	8	Safety	28' 0½"	C	M
Louisiana:					
Baton Rouge Electric Co	8	Safety	28' 0"	C	M
Shreveport Railways Co	*3	Passenger	40' 8"	C	M
Minnesota:					
Wisconsin Railway, Light & Power Co. (Winona)	8	Safety	28' 0"	C	M
Missouri:					
Kansas City, Clay County & St. Joseph Ry. Co	* 1	Freight	42' 0"	I	M
	3	Passenger	51' 5"	I	M
United Railways of St. Louis	10	Safety	28' 0½"	C	M
	50	Passenger	45' 0"	C	M
	*51	Passenger	50' 6"	C	M
	* 1	Work	40' 0"	C	M
Nebraska:					
Lincoln Traction Co	15	Safety	28' 0½"	C	M
Omaha & Council Bluff St. Ry	5	Safety	28' 0½"	C	M
	2	Snow Swpr.	29' 0"	C	M
Omaha, Lincoln, & Beatrice Railway Co	2	Passenger	42' 0"	C	M
	1	Passenger	30' 0"	C	M
North Dakota:					
Grand Forks St. Railway Co	6	Safety	27' 9½"	C	M
Northern States Power Co. (Fargo)	15	Safety	27' 9½"	C	M
Oklahoma:					
Pittsburgh County Railway Co. (McAlester)	2	Passenger	43' 7"	I	M
Oregon:					
Oregon & California Railroad (Salem)	4	Safety	28' 0½"	C	M
Pacific Pwr. & Lt. Co. (Astoria)	1	Safety	28' 0½"	C	M
Southern Pacific Co. (Portland)	4	Safety	28' 0"	C	M
	6	Passenger	55' 10"	I	M
	6	Passenger	55' 10"	I	T
South Dakota:					
Sioux Falls Traction System	3	Safety	28' 0½"	C	M
Texas:					
Austin Street Railway Co	10	Safety	28' 0½"	C	M
Dallas Railway Co	50	Safety	28' 0½"	C	M
El Paso Electric Railway Co	10	Safety	28' 0½"	C	M
Houston Electric Co	15	Safety	28' 0½"	C	M
Northern Texas Traction Co. (Fort Worth)	4	Passenger	52' 0"	I	M
	35	Safety	28' 0½"	C	M
San Antonio Public Service Co	15	Safety	28' 0½"	C	M
Texas Electric Ry. Co. (Dallas)	4	Passenger	56' 0"	I	
Utah:					
Bamberger Electric R. R.*	1	Passenger	58' 0"	I	M
	5	Passenger	58' 0"	I	T
	1	Express	58' 0'	I	M
	1	Express	42' 0"	I	T
Salt Lake & Utah Railroad Co	10	Freight, Box	36' 10½"	I	T
	50	Freight, Gondola	41' 9½"	I	T
Utah-Idaho Central R. R. Co	100	Freight	46' 2½"	I	T
Washington:					
Pacific Northwest Traction Co	‡4	Freight	41' 0"	I	M
Puget Sound Power & Light Co. (Bellingham)	8	Safety	28' 0½"	C	M
Canada:					
Brantford Municipal Ry., (Ont)	2	Safety	32' 0"	C	M
Grand River Railway Co. (Ont.)	7	Passenger	61' 6"	I	M
	1	Express	61' 6"	I	M
Hydro-Electric Power Commission (Ont.)	2	Passenger	36' 0	C	M
	12	Passenger	33' 0"	C	M
	6	Passenger	33' 0"	C	T
	2	Snow Swpr.	33' 0"	C	M
Lake Erie & Northern Railway Co., (Ont.)	3	Passenger	61' 8"	I	M
	1	Passenger	61' 8"	I	T
Sherbrooke Ry. & Pwr. Co. (Que.)	2	Safety	30' 0"	C	M
Southern Canada Power Co	1	Safety	28' 0½"	C	M
Toronto Civic Railway (Ont.)	25	Safety	28' 0½"	C	M
Toronto Suburban Railway (Ont.)	2	Express	52' 0"	I	M
Winnipeg Electric Ry. Co., (Man.)	6	Snow Swpr.	28' 0"	C	M

* Built in companies' own shops. † Rebuilt. ‡ Second hand.

ELECTRIC LOCOMOTIVES

	Number	Weight Tons.	Length Over All, Ft.	In.
New England District:				
Rutland Railway, Light & Power Co	1	..	..	..
North of the Ohio and East of the Mississippi River:				
Metropolitan West Side Elev. Ry. Co. (Ill.)	2	50	37	4
Albany Southern Railroad Co. (N. Y.)	1	..	46	6
Brooklyn Rapid Transit Co. (N. Y.)	1	..	35	6
Youngstown & Suburban Railway Co. (Ohio)	1	45	..	..
Monongahela Valley Traction Co	1	..	34	0
Washington & Old Dominion Ry	1	..	34	4½
West of the Mississippi River:				
Bamberger Electric R R. Co	1	..	42	0
Pacific Electric Railway	2	60	..	..
Tidewater Southern Railway (Cal.)	1	60	..	..
Salt Lake & Utah Railroad Co (Utah)	3	..	31	2½
Canada:				
Grand River Railway Co	1	..	36	0
Lake Erie & Northern Railway Co	1	..	36	0

A more detailed description of the cars ordered during the last five years is found in Table II. Referring to this table it will be noted that the railways are approaching the same number of cars as were purchased in 1916, when 3,900 cars were ordered. The rolling stock built by electric railways in their own shops has also held its own this year, having increased by only one car. The companies which built a large part of their own cars this year were the United Railways of St. Louis, which built 51 motor passenger cars, and the Chicago Surface Lines, which equaled St. Louis by constructing the same number, except that they were trailer cars.

Among the larger orders for cars this year were

TABLE IV—RECAPITULATION OF CARS AND LOCOMOTIVES ORDERED—1920

		New England District	North of the Ohio and East of the Mississippi River	South of the Ohio and East of the Mississippi River	West of the Mississippi River	Total United States	Canada	Cuba	Total
Number of companies reporting		20	85	15	45	165	9	1	175
Total cars and electric locomotives ordered		449	1,937	161	927	3,474	74	50	3,598
City Service:									
Safety cars		246	852	128	443	1,669	30	..	1,699
Passenger cars	Motor	184	448	25	126	783	14	50	847
	Trailer	1	336	...	...	337	6	..	343
Service cars		15	78	...	3	96	8	..	104
Total city cars		446	1,714	153	572	2,885	58	50	2,993
Interurban Service:									
Passenger cars	Motor	1	125	5	54	185	10	..	195
	Trailer	...	4	...	27	31	1	..	32
Express and freight cars		1	87	3	267	358	3	..	361
Total interurban cars		2	217	8	348	574	14	..	588
Electric locomotives		1	7	...	7	15	2	..	17
Number of companies ordering safety cars		15	51	11	32	109	4	..	113

200 steel motor cars for the Brooklyn Rapid Transit Subway System. The first 100 of these were ordered in May and the second 100 in December, 1920. The Public Service Corporation of New Jersey placed an order for 200 safety cars and 100 trailer passenger cars 49 ft. 9 in. long. The Milwaukee Electric Railway & Light Company ordered 100 motor cars, 45 ft. long, that can be operated either by one or two men. In Baltimore the United Railways & Electric Company ordered 100 passenger trailer cars. The use of the trailer car seems to be increasing rapidly. Besides the two orders already mentioned, the Cleveland Railway ordered fifty motor and fifty trailer passenger cars.

Table I shows the details of the rolling stock ordered by the individual companies. The companies are alphabetically arranged by states and the states are grouped into districts. The cars ordered by the companies listed under the territory "North of the Ohio and East of the Mississippi River" were by far the greatest, the number being 1,947 cars, which is 54 per cent of the total rolling stock ordered.

All cars are specified as to the service for which they are intended. No attempt has been made to give details as to construction other than the over-all length. Most of the cars are either of semi-steel or all-steel construction. The day of the wooden car is past, except for freight, express or service cars.

It is practically impossible to receive replies from all electric railway companies when a definite date is set for publication. Answers to questionnaires were received from more than 700 railway companies and have been supplemented by notes previously published.

Through the courtesy and co-operation of the car builders it has been possible to check these figures furnished by the railway companies, and in some cases where the companies have failed to report the figures as furnished by the car manufacturers have been used. Hence it is believed that few cases of cars built during the year have been missed.

The ELECTRIC RAILWAY JOURNAL wishes to thank all those who co-operated in making possible the publication of this information.

Track Extensions and Reconstruction

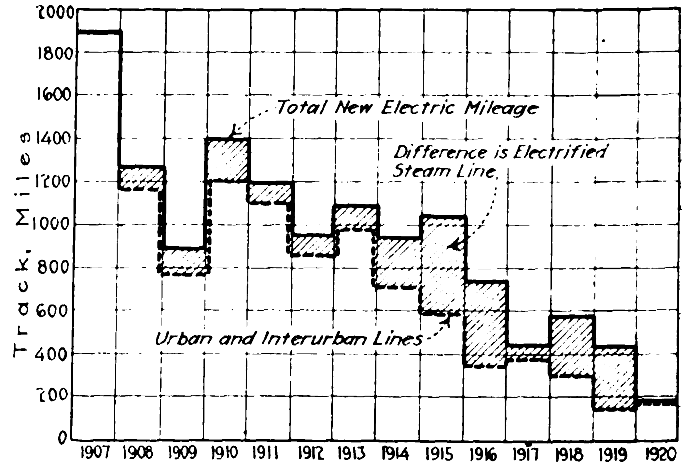
One Hundred and Sixty-five Urban and Interurban Railway Companies Report on Track Construction—87 Built 185 Miles of Extensions and 131 Companies Reconstructed 361 Miles of Track During Past Year—Only 9 Miles of Steam Road Were Electrified — More New Track Was Built, But Less Track Was Reconstructed than Last Year

THE outlook for the electric railways in the future seems to be very favorable if the figures showing track extensions and track rebuilt by the companies during 1920 may be taken as any indication. In 1919 the track extensions were the lowest that had ever been encountered for at least fourteen years, as the summary "Comparison of Track Construction" illustrates. The number of miles of track extensions during 1920 was 185.48, and although this does not approach very closely the figure of 1918 it is at least a step in that direction. This new track represents an increase over 1919 of 36 miles in the urban and interurban lines, or an increase of 25.6 per cent.

The fact that the electrified steam railroads constructed very little track compared with last year makes the comparison of the total seem worse. According to all reports that can be found, the track that was extended by the electrified steam lines was less than 10 miles, while in 1919 for the same item 287 miles were reported.

Of the total mileage of track extensions constructed by city or interurban electric railways nearly one-third was built in New York City, the Interborough Rapid Transit Company having extended its subway mileage by 38.84 miles, while its competitor, the New York Municipal Railway Corporation, was building 14 miles of new track.

The track rebuilt has not come up to the total of last year, but this figure has not deviated enough from 1919 to mention the difference. The price of rails was so high that the electric railways have not replaced any track except where it was absolutely necessary to do so. Both the extensions and the rebuilt track seem to show that it has been the policy not to extend or rebuild any track unless required by city paving contracts or where absolutely necessary on account of traffic conditions.



THIS CHART SHOWS MILES OF NEW TRACK BUILT EACH YEAR SINCE 1907

In the accompanying table is given the single-track mileage built by urban and interurban railways during 1920. This table was prepared from questionnaires which were sent to approximately 800 companies and which were returned by more than 700. The majority

COMPARISON OF TRACK CONSTRUCTION

Year	No. of Cos.	Extensions Urban Track	Extensions Interurban Track	Extensions Electrified Steam Lines	Extensions Total	Track Rebuilt
1907	(a)	(a)	(a)	....	1,880.00	(a)
1908	157	1,174.5		84.00	1,258.50	(a)
1909	160	774.7		112.40	887.16	(a)
1910	217	1,204.8		192.40	1,397.20	(a)
1911	223	1,105.0		86.50	1,191.50	(a)
1912	171	869.4		80.80	950.20	(a)
1913	181	974.9		119.00	1,093.90	(a)
1914	163	716.5		229.00	946.40	(a)
1915	136	596.0		448.20	1,044.20	(a)
1916	104	115.40	240.90	388.00	744.30	(a)
1917	121	251.10	125.60	66.00	442.70	375.40
1918	80	216.41	97.41	275.70	589.53	155.43
1919	73	110.90	29.67	287.60	428.17	390.64
1920	87	145.69	30.87	8.92	185.48	361.77

(a) Not available.

TRACK EXTENSIONS AND TRACK REBUILT DURING 1920

New England District

	Extensions	Rebuilt
Connecticut:		
The Connecticut Co. (New Haven)	0.46	5.07
Maine:		
Androscoggin & Kennebec Ry. Co. (Lewiston)	0.00	1.90
Bangor Railway & Electric Co.	0.00	5.00
Cumberland County Ry. & Lt. Co. (Portland)	0.00	4.21
Fairfield & Shawmut Railway	0.00	0.25
Knox County Electric Co. (Rockland)	0.00	6.00
Somerset Traction Co. (Skowhegan)	0.00	1.00
Massachusetts:		
Boston Elevated Railway Co.	0.30	18.30
Brockton & Plymouth St. Ry. Co.	0.00	4.00
Massachusetts Northeastern St. Ry. Co.	0.00	6.00
Springfield Street Railway Co.	6.92	5.09
Union Street Railway	0.01	0.39
Worcester Consolidated St. Ry. Co.	0.41	3.90
Rhode Island:		
The Rhode Island Co. (Providence)	0.00	3.16
Vermont:		
Rutland Railway Light & Power Co.	0.50	0.12

North of Ohio and East of the Mississippi River

	Extensions	Rebuilt
District of Columbia:		
Capital Traction Co.	0.00	1.74
City & Suburban Railway Co.	0.00	0.27
Washington & Old Dominion Ry.	0.10	1.00
Washington Railway & Electric Co.	0.00	1.33
Illinois:		
Alton, Granite & St. Louis Trac. Co.	0.00	1.63
Aurora, Plainfield & Joliet R. R. Co.	0.00	1.00
Calumet & So. Chicago Railway Co.	0.00	0.04
Chicago City Railway Co.	0.00	0.06
Chicago Elevated Railways	0.00	10.44
Chicago & Interurban Trac. Co.	0.00	0.80
Chicago & Joliet Electric Railway Co.	0.00	2.03
Chicago, North Shore & Milwaukee R. R. (Highwood)	0.00	1.83
Chicago Railways Company	0.92	2.06
East St. Louis Railway Co.	0.00	2.37
East St. Louis & Suburban Railway Co.	0.00	1.87
Evanston Railway Co.	0.00	2.50
Fox & Illinois Union Railway (Aurora)	0.00	0.17
Hammond, Whiting & E. Chicago Ry. Co.	0.00	2.00
Indiana:		
Chicago, South Bend & Northern Ind. Ry. Co.	0.50	0.38
Indiana Railways & Light Co. (Kokomo)	0.19	0.00
Indiana Service Corporation (Fort Wayne)	1.00	1.42
Interstate Public Service Co. (Indianapolis)	3.33	0.00
Public Utilities Co. (Evansville)	0.00	2.50
Union Traction Co. of Indiana (Anderson)	0.62	1.34
Maryland:		
United Railways & Light Co. of Baltimore	3.50	13.50
Michigan:		
Grand Rapids Railway Co.	0.04	1.70
New Jersey:		
Trenton & Mercer County Trac. Co.	1.10	0.31
New York:		
Black River Traction Co. (Watertown)	0.00	0.25
Brooklyn City Railroad Co.	0.00	0.08
Brooklyn Rapid Transit Co. (Surface Lines)	0.00	0.97
Buffalo & Lake Erie Traction Co.	0.53	1.01
Cortland County Traction Co.	0.00	0.49
Elmira Water, Light & R. R. Co.	0.00	1.00
Empire State Railroad Corporation	0.00	0.50
Hudson Valley Ry. Co. (Glens Falls)	0.35	0.41
Interborough Rapid Transit Co.	38.84	0.00
International Railway (Buffalo)	0.25	2.60
New York Municipal Ry. Corpn. (Subway)	14.00	0.00
New York State Railways	1.02	3.77
New York, Westchester & Boston Railway Co.	1.63	0.00
Ogdensburg Street Railway Co.	0.00	0.50
Poughkeepsie & Wappingers Falls Ry. Co.	0.00	1.36
Waverley, Sayre & Athens Traction Co.	0.00	0.74
Ohio:		
Cincinnati Traction Co.	1.15	3.64
Dayton & Troy Electric Railway Co.	0.23	0.42
Ohio Traction Co.	0.07	2.88
Pennsylvania-Ohio Electric Co. (Youngstown)	0.00	3.06
Richland Public Service Co.	0.00	1.00
Springfield Railway Co.	0.00	1.00
Toledo, Bowling Green & Southern Traction Co.	0.00	20.00
Toledo, Fostoria & Findlay Railway Co.	0.00	10.00
Toledo Railways & Light Co.	2.00	0.00
Youngstown Municipal Railway	0.00	0.76
Pennsylvania:		
Altoona & Logan Valley Electric Ry. Co.	0.51	0.55
Blue Ridge Traction Co. (Danville)	6.80	0.00
Conestoga Traction Co. (Lancaster)	0.00	0.75
Eastern Pennsylvania Railways Co. (Pottsville)	0.00	1.00
Frankford, Tacony & Holmesburg St. Ry. Co. (Phila.)	0.00	3.00
Harrisburg Railways Co.	0.61	0.66
Hershey Transit Co.	0.00	15.00
Indiana County Street Ry. Co.	0.00	15.00
North Branch Transit Co.	0.15	0.55
Pittsburgh Railways Co.	0.00	25.32
Reading Transit & Light Co.	0.00	0.99
Trenton, Bristol & Philadelphia St. Ry. Co.	0.00	1.00
West Chester Street Railway Co.	0.00	1.00
West Penn Railways	0.00	2.00
Wilkes-Barre Railway Co.	0.50	0.00
York Railways Co.	0.00	2.30
Wisconsin:		
Madison Railways Co.	0.82	0.00
Milwaukee Electric Railway & Light Co.	3.48	6.75
Wisconsin Valley Electric Co.	0.92	1.00

South of the Ohio and East of the Mississippi River

	Extensions	Rebuilt
Alabama:		
Birmingham Ry., Lt. & Pwr. Co.	1.31	0.00
Florida:		
Tampa Electric Co.	0.22	0.00
Georgia:		
Georgia Railway & Power Co (Atlanta)	0.84	2.59
North Carolina:		
Durham Traction Co.	0.22	0.84
Raleigh Street Railway Co.	0.23	0.00
South Carolina:		
Charleston Consolidated Ry. & Ltg. Co.	0.24	2.00
Tennessee:		
Memphis Street Railway Co.	0.33	2.60
Nashville Railway & Light Co.	0.00	3.00
Virginia:		
Danville Traction & Power Co.	0.29	0.73
Newport News & Hampton Railway, Gas & Electric Co.	0.00	0.95
Virginia Railway & Power Co. (Richmond)	1.95	2.50
West Virginia:		
Charleston Interurban Railroad Co.	1.50	1.00
Monongahela Valley Traction Co. (Fairmont)	0.60	0.79
Ohio Valley Electric Railway Co. (Huntington)	0.00	0.71
Wheeling Traction Co.	0.00	0.32

West of the Mississippi River

	Extensions	Rebuilt
Arkansas:		
Fort Smith Light & Traction Co.	0.00	0.50
California:		
Humbolt Transit Co. (Eureka)	0.44	0.00
Los Angeles Railway Corporation	4.75	0.00
Pacific Gas & Electric Co. (Sacramento)	0.00	1.00
Petaluma & Santa Rosa R. R. Co.	0.25	0.00
Sacramento Northern Railroad	2.07	0.00
San Francisco, Napa & Calistoga Railway Co.	2.00	0.00
San Francisco-Oakland Terminal Railways	1.12	0.50
Visalia Electric Railroad Co. (Exeter)	0.00	1.50
Colorado:		
Arkansas Valley Ry., Lt. & Power Co. (Pueblo)	0.00	2.50
Denver & Intermountain Railroad Co.	0.00	0.83
Denver Tramway Co.	0.45	4.54
Iowa:		
Albia Light & Ry. Co.	0.00	0.94
Clinton, Davenport & Muscatine Railway Co.	0.50	0.00
Mississippi Valley Electric Co. (Iowa City)	0.00	0.68
Tri-City Railway Co.	0.11	0.62
Kansas:		
Arkansas Valley Interurban Ry. Co. (Wichita)	4.00	0.00
Kansas City, Leavenworth & Western Ry. Co.	0.00	4.00
Minnesota:		
Duluth Street Railway Co.	1.99	3.24
Twin City Rapid Transit Co. (Minneapolis)	14.07	1.18
Wisconsin Ry., Lt. & Power Co. (Winona)	0.85	0.65
Missouri:		
City Light & Traction Co. (Sedalia)	1.50	0.00
Kansas City, Lawrence & Topeka El. R. R. Co.	0.00	3.50
Kansas City Railways Co.	3.53	3.15
St. Joseph Railway, Light, Heat & Power Co.	0.00	3.10
United Railways Company of St. Louis	0.15	22.87
Nebraska:		
Lincoln Traction Co.	0.00	0.94
Omaha & Council Bluffs St. Ry. Co.	1.00	1.50
Omaha, Lincoln & Beatrice Ry. Co. (Lincoln)	0.19	0.38
North Dakota:		
Capitol Street Car Line	0.00	0.50
Northern States Power Co. (Fargo)	0.00	0.68
Oklahoma:		
Chickasha Street Railway Co.	0.50	0.00
Enid City Railway Co.	0.00	0.53
Oregon:		
Portland Railway, Light & Power Co.	0.00	1.10
South Dakota:		
Sioux Falls Traction System	0.33	0.00
Texas:		
Dallas Railway Co.	3.60	3.60
Galveston Electric Co.	0.00	1.00
Northern Texas Traction Co.	4.94	1.42
Utah:		
Utah-Idaho Central R. R. Co.	0.00	4.50
Washington:		
Gray's Harbor Railway & Light Co.	0.00	1.04
North Coast Power Co. (Vancouver)	0.00	0.50
Puget Sound International Ry. & Power Co. (Everett)	0.27	0.00
Puget Sound Power & Light Co. (Bellingham)	0.36	0.00
Seattle Municipal Street Railway	1.87	0.00
Seattle & Rainier Valley Railway Co.	0.00	0.38
Washington Water Power Co. (Vancouver)	0.00	0.50

Canada

	Extensions	Rebuilt
British Columbia El. Ry. Co., Ltd.	2.04	0.00
Cape Breton Electric Co., Ltd.	0.34	0.24
Grand River Railway	5.69	0.00
Kitchener & Waterloo Street Railway	0.91	0.00
Levis County Railway	0.00	2.00
London & Port Stanley Railway	3.20	0.00
Montreal Tramways Co.	1.54	6.65

Canada (*Continued*)

	Extensions	Rebuilt
Moose Jaw Electric Railway Co., Ltd	1.00	4.00
New Brunswick Power Co	1.00	1.75
Nova Scotia Tramways & Power Co., Ltd	1.12	0.00
Peterboro Radial Railway	0.00	0.45
Quebec Railway, Light & Power Co	0.58	0.00
Regina Municipal Railway (Spur track)	0.26	0.00
Sarnia Street Railway Co., Ltd	0.00	1.00
Saskatoon Municipal Railway	0.57	0.00
Sherbrooke Railway & Power Co	1.14	0.00
Toronto Civic Railway	0.94	0.00
Winnipeg Electric Railway Co	0.61	2.08

SUMMARY OF TRACK CONSTRUCTION—1920

	New England District	North of the Ohio and East of the Mississippi River	South of the Ohio and East of the Mississippi River	West of the Mississippi River	Total United States	Canada	Total
TRACK EXTENSIONS							
Urban and Interurban Lines:							
Number of companies	5	30	11	25	71	16	87
Miles of track:							
Urban	8.09	75.62	5.39	37.96	127.06	18.63	145.69
Interurban	0.50	12.54	2.34	11.08	26.46	4.41	30.87
Total track extended	8.59	88.16	7.73	49.04	153.52	23.04	176.56
TRACK RECONSTRUCTION							
Urban and Interurban Lines:							
Number of companies	15	63	12	33	123	8	131
Miles of track:							
Urban	42.58	114.35	16.04	55.06	227.64	18.18	246.21
Interurban	21.81	73.23	2.00	18.52	115.56	.....	115.56
Total track rebuilt	64.39	187.58	18.04	73.58	343.59	18.18	361.77

of these companies reported no extensions or rebuilt track except the usual maintenance. There were 87 companies which reported a total of 185.48 miles extended, 78.5 per cent of which was built as city track and 16.7 per cent was built as interurban track. The remaining 4.8 per cent covers the electrified steam railroad which was extended.

The statistics in this main table are reported for individual companies which have been arranged by states, which in turn have been geographically arranged into five districts. As the greater proportion of the companies are in the district "North of the Ohio and East of the Mississippi River" it is not unusual that this district should be first in the amount of track extended or rebuilt, both urban and interurban. Again, as last year, New York State has the largest number of miles of track extended, with 54.02 miles city track and 2.60 interurban, or a total of 56.62 miles. The larger proportion of this mileage, amounting to 52.84 miles, is in New York subways. Only about 6.7 per cent of the total was extended by all the other companies in the state. Minnesota ranks next to New York, with 15.11 miles of extensions. The largest track extension by any company other than the New York subways was reported in Minnesota by the Twin City Rapid Transit Company, with a city extension of 13.28 miles. Only three other companies reported four or more miles of track extensions.

ELECTRIFIED STEAM LINES

	Extensions	Rebuilt
New York, New Haven & Hartford R. R. (yard at Cedar Hill and New Haven)	8.92	0.00

The largest amount of track rebuilt in any state was in Pennsylvania, where fourteen companies reconstructed 69.12 miles. Ohio was next, with 42.76 miles. The two states having the largest mileage rebuilt come in the same geographical section, thereby making this section, which is the same one referred to as being the first in track extensions, the banner district in track rebuilt.

The largest amount of track rebuilt by any one company during the year was by the Pittsburgh Railways Company, with 19.77 miles of city track and 5.55 miles of interurban track. Other companies reconstructing mileage above the average were United Railways & Electric Company of Baltimore, Boston Elevated Railway, United Railways of St. Louis, and the Toledo, Bowling Green & Southern Traction Company, with 13.50, 18.50, 22.87 and 20 miles respectively. There were four other companies which rebuilt more than 10 miles.

The only electrification of steam railroads that can be accounted for is 8.92 miles of new track constructed by the New York, New Haven & Hartford in and around the new classification yards at Cedar Hill, Conn., and in other yards at New Haven, Conn.

Fifteen companies from Canada, or about one-fifth of the total companies reporting extensions, constructed new track consisting of 21 miles, or about 12 per cent of the total.

An attempt has been made to determine the plans of the electric railways for the coming year, and as far as can be estimated from their replies they expect to construct in new track about 65 miles, and intend to rebuild at least 340 miles.

Professor Sheldon's Memory Honored

ON NOV. 17 impressive exercises in memory of the late Prof. Samuel Sheldon were held in New York at the Engineering Societies' Building. Addresses were made by Dr. A. E. Kennelly, professor of electrical engineering Harvard University and Massachusetts Institute of Technology; W. N. Dickinson, president New York Electrical Society; W. H. Nichols, chairman board of trustees Brooklyn Polytechnic Insititute; T. C. Martin, secretary National Electric Light Association, and Dr. C. O. Mailloux, consulting engineer.

The work done as a teacher and engineer by Dr. Sheldon during the more than thirty years of his connection with the B. P. I. was discussed by several speakers, and tributes were paid to his excellence in these fields as well as to his friendly qualities. A plan for a permanent memorial was outlined, a committee to this end with Mr. Martin as chairman having already been formed. This committee has since met and made provision for a general appeal for funds. One subscription of $1,000 was announced.

Street Railway Problem in New Orleans

IN A recent issue of the Association of Commerce *News Bulletin*, New Orleans, La., Leigh Carroll, chairman Civic Bureau New Orleans Association of Commerce, presents a statement on "The Street Railway Problem or Situation in New Orleans."

Mr. Carroll starts with the statement that "New Orleans needs a new railway system!" and then goes on to analyze the present inadequacies of service in New Orleans. He points out the limitations under which the local railways have been forced to operate for the past several years and shows the antiquated provisions of the franchises, the inadequate rate and other deficiencies of authority or opportunity for the railway really to serve the community.

He concludes by stating that the time is at hand when New Orleans must "get busy," for the whole community is suffering because adequate transportation facilities have not been allowed to develop.

Electric Railway Receiverships

Fewer Receiverships Occurred in 1920 than in Preceding Year—Only Two Large Urban Properties Are Added to the List of Bankrupts—Higher Fares and Business Prosperity Save Many from Such Serious Difficulties for the Time Being—Large Abandonments of Unprofitable Track and Service Are Indicated

A SLIGHTLY happier year for the street railways as a whole is indicated for the year 1920 by a smaller addition to the total number of receiverships reported, as compared with the previous year. The stimulated condition of business as a whole, resulting in increased patronage for the traction companies, together with the generally increased rates of fare, saved many companies from bankruptcy during the year just passed. It should be noted further, that the drastic conditions of war times succeeded in either wiping out or causing the complete re-organization of many of the weaker companies so that as a whole the industry was in a stronger position in 1920. However, there are no cases reported of receivers being discharged without foreclosure or re-organization, all the companies reported as being in receivership on Dec. 31, 1919, either remaining under the jurisdiction of the courts or else undergoing some drastic reorganization.

TABLE I—RECORD OF ELECTRIC RAILWAY RECEIVERSHIPS

Year	Number of Companies	Miles of Single Track Involved	Outstanding Stock	Securities Bonds
1909	22	558 00	$29,962,200	$22,325,000
1910	11	696 61	12,629,400	75,490,735
1911	19	518 90	29,533,450	38,973,293
1912	26	373 58	20,410,700	11,133,800
1913	18	342 84	31,006,900	47,272,200
1914	10	362 39	35,562,550	19,050,460
1915	27	1,152 10	40,298,050	39,372,375
1916	15	359 26	14,476,600	10,849,200
1917	21	1,177.32	33,918,725	33,778,400
1918	29	2,017.61	92,130,388	163,257,102
1919	48	3,781.12	221,259,354	312,915,104
1920	16	992.11	25 313,655	68 860 575

TABLE III—ELECTRIC RAILWAY RECEIVERSHIPS—1920

(Listed alphabetically by States)

	Miles
Denver (Col.) Tramways	227.45
Pensacola (Fla.) Electric Co.	21.70
Caldwell (Id.) Traction Co.	11.40
Alton (Ill.) Granite & St. Louis Traction Co.	62.00
Kansas City (Mo.) Railways	311.50
Richmond Lt. & R.R. Co. (Staten Island, N. Y.)	32.05
Staten Island (N. Y.) Midland Ry.	28.68
Shore Line Electric R.R. (White Plains, N. Y.)	1.46
Westchester St. R.R. of White Plains, N. Y.	20.98
Western New York & Penn. Trac. Co. (Olean, N. Y.)	100.00
Ashtabula (O.) Rapid Transit Co.	5.50
Cleveland, Alliance & Mahoning Valley R.R. (Ravenna, O.).	46.00
Cleveland & Erie Ry. (Girard, Pa.)	30.00
Rhode Island Suburban Ry. (Providence)	75.39
Bryan (Tex.) & College Interurban Ry.	7.75
Barre & Montpelier (Vt.) Trac. & Power Co.	10.25
Total for 1920 (16 Cos.)	992.11

During 1920, sixteen additional companies passed into the hands of receivers, while ten were sold at foreclosure, re-organized, or wholly abandoned as an aftermath of the receivership. The mileage of the companies newly involved in receiverships is 992.11, only two large companies, the Kansas City Railways with 311.50 miles and the Denver Tramways with 227.45 miles, being included, whereas in 1919 a number of important systems were included, such as the Rhode Island Company, New York Railways, United Railways of St. Louis, and New Orleans Railway & Light Company.

The tables do not include certain companies that were sold at foreclosure for reorganization purposes only without the intervention of a receiver. So far as known there are three companies in this class, namely, the Kansas City-Western Railway; the Oakland, Antioch and Eastern Railway and the Norfolk & Bristol Street Railway.

TABLE II—RECORD OF ELECTRIC RAILWAY FORECLOSURE SALES

Year	Number of Companies	Miles of Track Involved	Outstanding Stock	Securities Bonds	Receiver's Certificates
1909	21	488 00	$22,265,700	$21,174,000	(a)
1910	22	724 36	19,106,613	26,374,075	(a)
1911	25	660 72	91,354,800	115,092,750	(a)
1912	18	267 18	14,197,300	10,685,250	(a)
1913	17	302 28	15,243,700	19,094,500	(a)
1914	11	181 26	26,239,700	44,094,241	(a)
1915	19	308 31	30,508,817	16,759,997	(a)
1916	19	430 14	13,895,400	22,702,300	(a)
1917	26	745 19	27,281,900	27,313,045	(a)
1918	23	524 22	37,740,325	20,149,384	(a)
1919	28	2,625 48	83,893,400	75,736,738	$42,300
1920	11	224 20	6 182,400	9,315 528	52 000

(a) Not available.

An interesting feature of the year just passed is the continuation of the process of dismemberment of some of the very large companies, which in the early days of the industry drew a number of the smaller independent lines together into unified operating systems either by stock control or long-term leases. It has been the customary and generally accepted belief that such mergers would result in increased net earnings by means of greater operating efficiency and the elimination of duplicated management expenses and competing service.

TABLE IV—ABANDONMENTS—ENTIRE—1920

(Includes only companies whose entire traction property has been dismantled or permanently abandoned and not likely to resume operations)

	Miles	Stock	Bonds
Colorado Springs (Col.), Cripple Creek District Ry. (Electric Div.)	18 50	(b) 2,000,000	(b) 2,827,878
Durango (Colo.) Ry. & Realty Co.	2 50	(a)	(a)
Blue Hill St. Ry. (Canton, Mass.)	19 50	300,000	250,000
Norwood, Canton & Sharon (Mass.) St. Ry.	6 20	(a)	(a)
Plymouth (Mass.) & Sandwich St. Ry.	6 40	151,800	None
Norfolk & Bristol St. Ry (Foxboro)	21 74	200 000	189 000
Columbus (Miss.) Ry. Lt. & Power Co.	( )6.80	( )	( )
Southern Ry. & Lt. Co. (Natchez, Miss.)	( )6 00	( )	( )
N. Y. & North Shore Trac. Co. (Roslyn)	38 12	979,350	800,000
Penn Central Ry. Co. (Johnstown)	7 50	250,000	......
Cincinnati (O.) & Columbus Trac. Co.	53 00	(a)	(a)
Cumberland Ry. Co. (Carlisle, Pa.)	11 00	350,000	404,700
Providence (R. I.) & Danielson Ry. (c)	38 00	1,000,000	600,000
Sea View R.R. (Wakefield, R. I.)	20 90	700,000	600,000
Greenville (Tex.) Ry. & Lt. Co.	8 00	300 000	300,000
Longview (Tex.) & Junction St. Ry.	1.00	(a)	(a)
Mineral Hts. St. Ry. (Greenville, Tex.)	2.75	(a)	(a)
Total for 1920 (16 companies)	267.91	6,231,150	5,971 578

(a) Not available.
(b) Covers capitalization of entire property.
(c) Line between North Scituate, R. I., and East Killingly already dismantled, balance will be torn up unless saved by local communities.
(d) Railway department only is abandoned. Company still continues light and power business.

The failure of the merger, when failure has resulted, may be ascribed to various causes, but it is certain that part of the trouble has been due to including in such mergers, many weak lines operating through territory where the traffic was never sufficient to justify operation as a paying proposition. This dismemberment feature is noted in such companies as the New York Railways, which in 1919 returned to the original owners the Eighth and Ninth Avenue lines, and in 1920, the Fourth Avenue line (New York & Harlem Railroad). The Rhode Island Company has turned back several leased properties, and the Shore Line Electric Railway of Connecticut has done the same. In the last named case, the receiver is now operating only 74 miles out of an original system of 246 miles, the balance having been returned to the original owners or abandoned. In some instances, the lines so severed from the bankrupt company are being operated successfully as individual units. In other cases after spasmodic attempts at operation, they have gone to the scrap dealer.

The tabulation of receiverships does not portray the entire situation in its full seriousness, as there are a number of companies whose bond interest is in default, and which are only permitted to continue without the intervention of a receivership due to the leniency of the bondholders or other creditors who have faith in a better future.

The statistics are presented in the usual way. Tables I and II give a summary of receiverships and foreclosures, respectively, by years from 1909 to date. The table of foreclosures includes all those companies which have been entirely reorganized or sold to the junk dealer, whether through actual process of foreclosure by the court or otherwise. The figures for 1919 do not in all cases agree with those published a year ago in the ELECTRIC RAILWAY JOURNAL of Jan. 3, 1920, due to additional and corrected information which has been received during this past year.

Table III is a separate list of the 1920 receiverships given to bring out these items more clearly than is done in the general tabulation. They will be found included in greater detail in Table IV, which shows the existing conditions, including all properties in receiver's hands at any time during 1920 as far as could be determined. Every effort has been made to get these statistics confirmed by

TABLE V—ELECTRIC RAILWAY RECEIVERSHIPS AND FORECLOSURES AS OF DEC. 31, 1920

	Year of Receivership	Miles of Single Track Involved	Outstanding Securities		
			Capital Stock	Funded Debt	Receivers' Certificates
New England District					
Connecticut					
Danbury (Ct.) & Bethel St. Ry.	1917	16.00	$320,000	$588,500	$60,000
Hartford & Springfield St. Ry. (Warehouse Point)	1918	48.00	785,000	961,000	None
Shore Line Electric Ry. (c)	1919	74.17	1,000,000	6,700,000	None
Maine					
Atlantic Shore Ry. (Kennebunk)	1915	49.93	1,000,000	1,746,250	None
Massachusetts					
Plymouth (Mass.) & Sandwich St. Ry. (a)	1918	6.40	151,800	None	None
Blue Hill St. Ry. (Canton) (a)	1919	19.70	300,000	250,000	2,000
Brockton & Plymouth (Mass.) St. Ry.	1919	22.00	250,000	260,000	None
New Hampshire					
Portsmouth, Dover (N. H.) & York St. Ry.	1917	42.33	(i)	707,000	20,000
Rhode Island					
Bay State St. Ry. (Newport Div.) (b)	1917	22.20	(b)	996,800	None
Rhode Island Co. (Providence) ( )	1919	101.15	9,685,500	1,662,000	None
United Traction & Electric Co.	1919	289.93	8,000,000	9,000,000	None
Rhode Island Suburban Ry. (Providence, R. I.)	1920	75.39	5 000 000	4 708 000	None
Vermont					
Springfield (Vt.) Elec. Ry.	1918	9.00	100,800	100,000	22,323
Barre & Montpelier (Vt.) Traction & Pwr. Co.	1920	10.25	(k) 2,337,000	(k) 1,986,300	None
Summary					
Total 1/1/20	11 cos.	842.54	$21,343,100	$22,711,500	$107,323
Net changes and corrections	1 cos.	*141.65*	250,000	260,000	*3,000*
Receiverships added during 1920	2 cos.	85.64	7,337,000	6,694,300	....
Less those sold or reorganized during 1920	*2 cos.*	*25.90*	*451,800*	*250,000*	*2,000*
Net receiverships 12/31/20	12 cos.	760.65	28,478,300	29,415,800	102,323
North of the Ohio and East of the Mississippi River					
Illinois					
Chicago (Ill.) & Oak Park Elevated R.R.	1911	20.97	10,000,000	6,537,000	1,645,000
Chicago, Aurora (Ill.) & De Kalb R.R.	1916	30.20	950,000	427,500	None
Galesburg & Western R.R. (Rock Island) (a)	1919	16.00	500,000	521,000	None
Aurora, Elgin & Chicago (Wheaton) R.R.	1919	168.00	6,200,000	8,371,000	None
Alton (Ill.) Granite & St. Louis Traction Co.	1920	62.00	3,189,000	3,000,000	None
Indiana					
Winona Interurban Ry. Co. (Warsaw)	1916	70.00	750,000	2,343 700	None
Beech Grove (Ind.) Traction Co.	1917	3.90	150,000	100,000	None
Vincennes (Ind.) Traction Co.	1919	7.50	350,000	235,000	50,000
Michigan					
Marquette City & Presque Isle (Mich.) Ry. (d)	1912	6.00	200,000	100,000	None
New Jersey					
North Jersey Rapid Transit Co. (Hohokus)	1912	18.00	800,000	800,000	None
Atlantic City (N. J.) & Shore R.R. Co.	1915	49.89	1,000,000	950,000	None
Monmouth County Elec. Co. (Red Bank) (d)	1916	18.50	350,000	500,000	17,500
New York					
Second Ave. R.R. (New York City)	1908	30.02	1,862,000	5,631,000	3,140,000
Rochester (N. Y.) Corning & Elmira Trac. Co. (j)	1912	(j) 6.00	271,000	1,000,000	None
Buffalo (N. Y.) & Lake Erie Traction Co. (h)	1915	168.00	7,500,000	7,066,000	960,000
Hornell (N. Y.) Traction Co. (d)	1917	10.90	117,900	150,000	25,000
Manhattan & Queens Trac. Co. (Long Isl. City)	1917	21.20	(x) 20 000	(x) 2 196 000	None
Binghamton (N. Y.) Ry. Co.	1918	49.74	978,995	2,390,000	40,000
Buffalo (N. Y.) & Depew Ry.	1918	13.59	305,000	350,000	60,000
Penn Yan (N. Y.) & Lake Shore Ry.	1918	8.50	94,000	100,000	6 000
Brooklyn (N. Y.) Rapid Transit Co.	1918	(Holding Co.)	(l) 87,788,268	(l) 126,107,477	18,000,000
New York Consolidated Ry.	1918	141.68	18,900,000	22,967,000	5,000,000
New York Municipal Ry. Corp.	1918	67.82	2,000,000	60,000,000	13,000,000
Surface Lines:					
Brooklyn Heights R.R.	1919	36.60	2,000,000	(n) 8,242,174	None
Brooklyn, Queen's County & Suburban R.R.	1919	61.92	2,000,000	(n) 9,256,710	None
Nassau Electric Ry.	1919	144.39	15,000,000	(n) 20,787,115	None
Coney Island & Brooklyn Ry.	1919	59.53	2,983,900	(n) 6,223,298	None
Interboro Consolidated Corp.	1919	(Holding Co.)	50,403,634	67,825,000	None
New York (N. Y.) Railways Co.	1919	(p) 97.72	(p) 22 081 760	(p) 53,122,483	None
Richmond Lt. & R.R. Co. (Staten Island)	1920	32.05	(f) 1,932,000	(f) 1,482,000	None
Staten Island (N. Y.) Midland Ry. Co.	1920	28.68	1,000,000	1,000,000	None
Western New York & Penn. Trac. Co. (Olean)	1920	100.00	1 599 355	2,492,000	None
Westchester St. R.R. of White Plains	1920	20.98	700,000	168,000	34 800
Shore Line Elec. R.R. (White Plains)	1920	1.46	50,000	None	None
Ohio					
Sandusky, Norwalk (O.) & Mansfield Elec. Ry.	1912	33.00	600,000	600,000	None
Cincinnati (O.), Lawrenceburg & Aurora Elec. St. Ry.	1913	31.89	808,900	750,000	None
Interurban Ry. & Terminal Co. (Cincinnati)	1914	41.03	3,500,000	1,650,000	49,000
Plymouth & Shelby Trac. Co. (d)	1917	6.97	200,000	200,000	None
Ohio River Elec. Ry. (Pomeroy)	1919	12.70	300,000	315,000	None
Springfield (O.) Term. Ry. & Power Co. (a)	1919	33.00	350,000	250,000	None
Cleveland, Alliance & Mahoning Valley R.R.	1920	46.00	1,100,000	1,100,000	None
Ashtabula (O.) Rapid Transit Co.	1920	5.50	500,000	382,000	....
Pennsylvania					
Philadelphia & Easton Elec. Ry. (Doylestown)	1912	31.00	612,600	911,000	None
Sunbury (Pa.) & Susquehanna Ry. (d)	1913	9.20	600,000	640,000	None
North Branch Transit Co. (Bloomsburg) (d)	1915	30.00	500,000	532,500	None
Buffalo & Lackawanna Trac. Co. (Erie)	1918	8.80	55,000	1,000,000	None
Cumberland Ry. Co. (Carlisle) (a)	1918	11.00	350,000	404,700	None
Pittsburgh (Pa.) Railways	1918	605.25	21,726,750	41,579,500	None
Scranton (Pa.) & Binghamton Ry. (d)	1918	50.00	6,000,000	4,100,000	....
Philadelphia (Pa.) Rys. Co.	1919	16.00	400,000	400,000	None
Penn. Central Ry. Co. (Johnstown) ( )	1919	7.50	250,000	....	....
Northampton Traction Co. (Easton)	1919	21.00	500,000	1,009,000	5,000
Northampton, Easton (Pa.) & Wash. Trac. Co.	1919	17.80	1,250,000	739,000	None
Cleveland & Erie Ry. (Girard)	1920	30.00	300,000	1,000,000	None
Summary					
Total 1/1/20	44 cos.	2 379.17	$138,317,549	$288,415,735	$24,245,500
Net changes and corrections	...	*81.82*	*2,850,544*	*516,000*	*297,000*
Receiverships added during 1920	9 cos.	326.67	10,370,355	10,624,000	34,800
Less those sold or reorganized during 1920	*4 cos.*	*6.750*	*1,450,000*	*1,175,700*	....
Net receiverships 12/31/20	49 cos.	2 556.52	144,387,360	297,348,035	23,983,300

correspondence with the companies in question, but where replies could not be obtained the data have been taken from financial papers and other sources believed to be reliable.

In some cases, additional or corrected information has been received concerning the figures published a year ago in the ELECTRIC RAILWAY JOURNAL. To bring the statistics up to date, a line showing net changes has been added to the summaries for each group as well as in the recapitulation summary in Table V.

Two companies not heretofore included have been added, namely, the Charlotte (N. C.) Rapid Transit Co. with 2 miles of track and $75,000 capital stock, and the Brockton & Plymouth (Mass.) Street Railway Co. with 22 miles of track, $250,000 capital stock and $260,000 bonds. This record shows that after adding the new receiverships occurring during the year, and deducting the companies foreclosed, reorganized or wholly abandoned, there remain in receivership at the close of the year 91 companies with 5,330.25 miles of track, representing about 11 per cent of the total street railway mileage of the United States. So far as has been learned, there are no Canadian companies in receivership.

TABLE V—ELECTRIC RAILWAY RECEIVERSHIPS AND FORECLOSURES AS OF DEC. 31, 1920

Continued

	Year of Receivership	Miles of Single Track Involved	Outstanding Securities		
			Capital Stock	Funded Debt	Receivers' Certificates
South of the Ohio and East of the Mississippi River					
Alabama					
Birmingham (Ala.) Tidewater Ry	1919	32.80	$325,000	$1,500,000	$12,000
Birmingham (Ala.) Ry. Lt. & Power Co	1919	154.96	(r) 4,230,000	(r) 8,820,000	363,000
Montgomery (Ala.) Lt. & Traction Co	1919	38.00	(k) 2,000,000	(k) 1,430,000	(k) 250,000
North Alabama Traction Co. (Albany) (*d*)	1919	7.63	75,000	225,000	....
Florida					
Jacksonville (Fla.) Traction Co	1919	64.10	1,500,000	(y) 2,034,500	65,000
Pensacola (Fla.) Electric Co	1920	21.70	(k) 1,100,000	(ky) 1,789,900	(k) 25 000
Georgia					
City & Suburban Ry. Co. (Brunswick)	1919	9.50	100,000	194,000	None
Savannah (Ga.) Elec. Co	1919	57.72	(k) 3,500,000	(ky) 6,074,376	None
Mississippi					
Jackson (Miss.) Lt. & Trac. Co	1919	13.50	(k) 1,600,000	(k) 915,000	None
North Carolina					
Charlotte (N. C.) Rapid Transit Co. (*a*)	1918	2.00	75,000	None	None
Tennessee					
Memphis (Tenn.) St. Ry	1919	130.40	5,000,000	8,164,000	None
Chattanooga (Tenn.) Ry. & Lt. Co. (*m*)	1919	68.43	(k) 5,000,000	(l) 2,790,000	None
West Virginia					
Morgantown (W. Va.) & Wheeling Trac. Co. (*s*)	1916	(s) 27.00	345,000	500,000	214,000
Grafton (W. Va.) Lt. & Power Co	1917	7.00	(t) 400,000	(t) 300,000	None
West Va. Traction & Elec. Co. (Wheeling) (*a*)	1919	39.00	1,869,600	4,762,000	None
So. Morgantown (W. Va.) Trac. Co. (*a*)	1919	6.00	36,000	None	None
Summary					
Total 1/1/20	14 cos.	567.48	$25,980,600	$40,500,004	$270,000
Net changes and corrections	1 cos.	*9.44*	75,000	*2,790,624*	420,000
Receiverships added during 1920	1 cos.	21.70	1,100,000	1,789,900	25,000
Less those sold or reorganized during 1920	*3 cos.*	*47.00*	*1,980,600*	*4,762,000*	....
Net receiverships 12/31/20	13 cos.	532.74	25,175,000	34,737,280	715,000
West of the Mississippi River					
Arizona					
Tucson (Ariz.) Rapid Transit Co	1919	4.35	500,000	114,800	None
Colorado					
Denver (Col.) & Interurban R.R. (*d*)	1918	44.43	101,500	1,079,000	None
Colorado Springs (Col.) & Cripple Creek R.R. (*o*)	1919	78.80	(k) 2 000 000	(k) 2 827 878	(k) 50 000
Denver (Col.) Tramways	1920	227.45	6,156 300	19,388,025	None
Idaho					
Caldwell (Id.) Traction Co	1920	11.40	250,000	None	None
Iowa					
Des Moines (Ia.) City Ry. Co	1918	94.00	1,305,000	5,981,000	10,000
Kansas					
Southwestern Interurban Ry. (Winfield)	1919	25.00	150,000	None	None
Louisiana					
New Orleans (La.) Ry. & Lt. Co	1919	222.12	(k) 30,199,050	(k) 38,481,000	(k) 750,000
Minnesota					
St. Paul Southern Ry. Co. (Hastings) (*d*)	1918	17.54	658,225	425,400	40,000
Missouri					
Kansas City (Mo.) Outer Belt Elec. R.R. (*d*)	1912	( )	None	1,298,000	100,000
Kansas City, Ozark & Southern Ry. (Ava) (*d*)	1913	15.00	300,000	None	....
Kansas City (Mo.), Lawrence & Topeka R.R	1919	12.00	250,000	400,000	None
United Railways Co. of St. Louis (Mo.)	1919	460.90	41,296,000	52,603,000	3,177,000
Missouri Electric R.R. (St. Louis)	1919	19.06	1,000,000	700,000	None
Kansas City (Mo.) Railways	1920	311.50	(w) 100,000	30,364,350	None
Oregon					
Southern Oregon Traction Co. (Medford) (*d*)	1918	8.19	150,000	150,000	....
Texas					
Corpus Christi (Tex.) Ry. & Lt. Co	1919	9.75	....	(q) 1 694 507	14 539
Greenville (Tex.) Ry. & Lt. Co. (*a*)	1919	8.00	300,000	300,000	None
Bryan (Tex.) & College Interurban Ry	1920	7.75	(u)	(u)	(u)
Summary					
Total 1/1/20	15 cos.	1,002.26	$78,210,975	$104,470,078	$3,063,611
Net changes and corrections	......	3.78	*1,000*	1,484,507	1,077,928
Receiverships added during 1920	4 cos.	558.10	6,506,300	49,752,375	....
Less those sold or reorganized during 1920	*2 cos.*	*83.80*	*2,300,000*	*3,127,878*	*50,000*
Net receiverships 12/31/20	17 cos.	1,480.34	82,416,275	152,579,082	4,091,539
RECAPITULATION					
Total 1/1/20	84 cos.	4,791.45	$263,852,224	$456,097,317	$27,686,434
Net changes and corrections	2 cos.	*229.11*	*2,526,544*	*1,562,117*	1,197,928
Receiverships added during 1920	16 cos.	992.11	25,313,655	68,860,575	59,800
Less those sold or reorganized during 1920	*11 cos.*	*224.20*	*6,182,400*	*9,315,578*	*52,000*
Net receiverships 12/31/20	91 cos.	5,330.25	280,456,935	514,080,197	28,892,162

NOTES

- (*a*) Sold at foreclosure during 1920.
- (*b*) Still in receivership but leased to Newport County Electric Co Figure given in funded debt column includes proportion of capital stock applicable to electric railway.
- (*c*) Property is being dismembered and reorganized without foreclosure sale, but under receiver.
- (*d*) Included in last years' report. No information available as to present status.
- (*e*) Reported as sold by foreclosure during 1920, without formal receivership proceedings.
- (*f*) Figures represent railway securities only. Estimated to be 67.4 per cent of total.
- (*g*) Property is being dismembered and sold, but not under formal foreclosure proceedings.
- (*h*) Figures include Hamburg Railway Company $750,000 First Mortgage Bonds, due Nov. 1926 on 17.70 miles track for which separate receiver was appointed Aug. 31, 1920.
- (*i*) Included in that of the Atlantic Shore Railway.
- (*j*) This Company secured right of way but built no track.
- (*k*) Securities include total property. Railway cannot be separated.
- (*l*) Figures given are for total amount of B. R. T. securities in the hands of the public, including also those of lessor companies whose securities are guaranteed by the B.R.T.
- (*m*) Receivership limited to Chattanooga Railway lines only.
- (*n*) Includes certificates of indebtedness held by B.R.T.
- (*o*) Figures given cover steam and electric divisions, of which 18.50 miles is electric. It is reported operation ceased May 17, 1920, and line is partly dismantled.
- (*p*) Excludes track and securities of three leased and controlled companies which have been returned to their owners for independent operation; viz.: Eighth Avenue R.R.; Ninth Ave. R.R., and the New York and Harlem R.R. (Fourth Avenue lines.)
- (*q*) Total of securities outstanding for combined property.
- (*r*) Railway securities shown, estimated at 57.2 per cent of total.
- (*s*) But three miles of road is electrified, the balance being operated by steam. Figures shown are for the entire property.
- (*t*) Figures given are for railway property only.
- (*u*) No information available.
- (*v*) Has no track built.
- (*w*) Stock has no par value. Nominal value given.
- (*x*) No bonds issued. Cost of construction carried by temporary note issues. $20,000 in stock subscription rights
- (*y*) Includes notes and bank loans.

The list of entire companies abandoned and junked is about the same in number and character as last year, but the number of companies reporting partial abandonments and suspensions is much greater. It is evident that there has been a determined effort to eliminate unprofitable track and service, in order to preserve investments threatened by shrinkage of net earnings.

TABLE VI—ABANDONMENTS—PARTIAL—1920

(Includes all pieces of track, sidings, yards, etc., permanently abandoned—Companies arranged alphabetically by States)

	Miles
Humboldt Transit Co. (Eureka, Cal.)	0.95
Los Angeles (Cal.) Ry	5.40
Peninsula Ry. Co. (San Jose, Cal.), (spur track)	0.17
Point Loma Ry. (San Diego, Cal.)	1.80
Sacramento-Northern Rys., Cal. (spurs and sidings)	1.02
San Francisco-Oakland Terminal Rys. (Cal.)	0.19
San Jose (Cal.) R.R.	1.56
Denver & Intermountain R.R. (Col.)	0.08
Denver (Col.) Tramways	0.41
Connecticut Co. (New Haven, Conn.) (sidings)	0.83
Shore Line Electric R.R. (Norwich, Conn.), (between New Haven and New London)	64.66
Tampa (Fla.) Electric Co	0.16
Georgia Ry. & Power Co. (Atlanta, Ga.)	0.17
Savannah (Ga.) Electric Co	1.60
Alton (Ill.) Granite & St. Louis Trac. Co	0.93
Chicago (Ill.) Railways	1.03
East St. Louis (Ill.) & Suburban Ry	0.16
Indiana Service Corp. (Ft. Wayne)	0.17
Interurban Ry. (Des Moines, Ia.)	4.72
Arkansas Valley Interurban Ry. (Wichita, Kan.)	2.00
Manhattan City (Kan.) & Interurban Ry	1.60
Salina (Kan.) St. Ry	0.50
Southeastern Interurban Ry. (Winfield, Kan.)	3.00
United Railways & Electric Co. (Baltimore, Md.)	0.90
Berkshire St. Ry. (Pittsfield, Mass.)	13.00
Massachusetts Northeastern St. Ry. (Haverhill)	3.30
Medway & Dedham St. Ry. (Westwood, Mass.)	4.00
Grand Rapids (Mich.) Ry. Co	0.13
Wisconsin Ry., Lt. & Power Co. (Winona, Minn.)	0.44
City Light & Traction Co. (Sedalia, Mo.)	8.25
Kansas City (Mo.) Railways	0.63
New York State Rys	0.39
Ogdensburg (N. Y.) St. Ry	0.50
Orange County Traction Co. (Newburgh, N. Y.)	0.28
Waverly (N. Y.) Sayre & Athens Trac. Co	3.02
Reno (Nev.) Traction Co	4.00
Toledo (O.) Rys. & Lt. Co	0.64
Toledo, Bowling Green & Southern Trac. Co. (Findlay, O.)	3.00
Bartlesville (Okla.) Interurban Ry	5.00
Chickasha (Okla.) St. Ry	1.00
Guthrie (Okla.) Ry. Co	0.50
Portland (Ore.) Railway, Light & Power Co	1.34
Northwestern Pennsylvania Ry. (Meadville, Pa.)	1.40
Pittsburgh (Pa.) Railways	1.03
Shamokin & Mt. Carmel (Pa.) Transit Co	0.75
El Paso (Tex.) Ry. Co	0.15
Virginia Ry. & Power Co. (Norfolk Div.)	6.00
Seattle (Wash.) Municipal Ry	0.29
Tacoma (Wash.) Ry. & Pwr. Co	0.08
Monongahela Valley Trac. Co. (Fairmont, W. Va.)	0.20
Milwaukee (Wis.) Elec. Ry. & Lt. Co	0.65
New Brunswick Power Co. (St. John, N. B.)	0.25
Grand River Ry. (Galt, Ont.)	2.00
Montreal Tramways (Que.)	0.96
Winnipeg Electric Ry. (B. C.)	1.24
British Columbia Electric Ry. Co. (Vancouver)	2.24
Total for 1920 (56 Cos.)	160.68

TABLE VII—SUSPENSIONS OF SERVICE 1920

(Includes miles of track on which companies have ceased to operate, but which have not been permanently abandoned or ripped up.)

	Miles
Douglas (Ariz.) Traction & Lt. Co	10.00
San Diego (Cal.) Electric Ry	4.96
Miami (Fla.) Traction Co	5.00
Indiana Service Corp. (Ft. Wayne, Ind.)	8.64
Androscoggin & Kennebec Ry. (Lewiston, Me.)	8.00
United Railways & Electric Co. (Baltimore, Md.)	4.30
Berkshire St. Ry. (Pittsfield, Mass.)	19.55
Boston (Mass.) Elevated Ry	8.00
Eastern Massachhsetts St. Ry. System:	
Line between Wakefield & Lynn	2.32
Line between East & South Weymouth	3.49
Line between Wilson's Corner and Andover Sq	1.39
Line between Mann's Corner and Assinippi	1.07
Line between Hyde Park and Dedham	3.15
Line between Linden and Cliftondale	1.58
Line between Saugus and Cliftondale	0.86
Gloucester Div (all lines)	22.49
Wollaston loop (Quincy Div.)	2.27
Lincoln Ave., Haverhill	0.91
Milford (Mass.) Attleboro & Woonsocket St. Ry	3.80
Kansas City (Mo.) Railways	2.51
Jersey Central Traction Co. (Keyport, N. J.)	2.00
Point Pleasant (N. J.) Traction Co. (Entire line)	3.72
Trenton, Lakewood (N. J.) & Seacoast R. R	3.00
Brooklyn (N. Y.) Rapid Transit Co	30.00
Ocean Ave. and Rogers Ave. lines from Flatbush Ave. and Rogers St. to Eastern District Ferry.	
Church Ave. line from Church and Rockaway Aves. to 39th St. Ferry.	
Park Avenue line from Broadway to Sands St. (entire line).	
Metropolitan Ave. line from Dry Harbor Ave. to Jamaica, also from Flushing Ave. to East River.	
Wyckoff Ave. line from Myrtle Ave. to Flushing (entire line).	
Ralph Ave. Shuttle from Ralph Ave. and St. Johns Place to Church Ave.	
Westchester St. R. R. (White Plains, N. Y.)	1.12
Goldsboro (N. C.) Electric Ry. (Entire line)	5.00
Pennsylvania & Ohio Trac. Co. (Ashtabula, O.)	2.00
Springfield (O.) Terminal Ry. & Power Co. (Entire line)	28.00
Toledo (O.) Rys. & Lt. Co	0.75
Longview (Tex.) & Junction Ry. (entire line)	1.00
Walla Walla (Wash.) Valley Ry	3.60
Total for 1920 (22 Cos.)	194.46

The largest individual abandonment reported is that of the Shore Line Electric Railway of Connecticut, which has abandoned 64 miles of track between New Haven and New London. Eight miles of this has already been torn up. It is now reported that some efforts are being made by certain communities along these abandoned routes to arrange for restoring service.

The trustees operating the Eastern Massachusetts Street Railway, formerly the Bay State system, have continued their policy of suspension of service on lines where the traffic would not support operation at any reasonable rate of fare. The largest portion of this system which ceased operation was the entire Gloucester Division, involving 22 miles of track. In some communities in Eastern Massachusetts operation has only been continued by means of local subsidies. The trustees have also practically eliminated jitney competition by the straightforward expedient of giving the local authorities the option of properly regulating the jitneys or giving up the street car service, and in several instances have given the citizens a trial of jitney service without street cars. This single experiment has generally demonstrated without question the inability of the jitneys adequately to provide for the transportation requirements of the community.

Altogether, the financial situation of the electric railways during 1920 may be said to have been a little better than during the two years immediately preceding, but it is still far from being even moderately satisfactory, and many companies are still running so close to the danger of bankruptcy that it is a question whether they can survive the business depression which the country as a whole is now experiencing.

Securing Co-operation of Trainmen in Accident Reduction

W. R. ALBERGER, vice-president and general manager San Francisco-Oakland Terminal Railways, recently addressed a letter to the motormen and conductors on his property giving them a report of the accident situation for the first nine months of 1920 as compared with the same period of 1919. By means of tables and comments he showed that the accidents over which the motormen and conductors had control had decreased in number this year by thirty-seven, and he expressed the thanks of the management for this showing. He said that whereas in 1919 there was an accident for every 30,319 passengers, in 1920 there was one for every 31,212 passengers. For ten months, including October, 1920, $110,039 had been expended for injuries to persons and damage to property, settlements by the claim agent or in lawsuits, as compared with $40,942 for the preceding year. These costs were 3.5 per cent of the operating expenses in 1920 as compared with less than 1.8 per cent in 1919.

Trackless Trolley in Richmond

FURTHER details are available in regard to the proposed trackless trolley system in Richmond, Va., mentioned on page 1167 of the issue of this paper for Dec. 4. A trial bus, seating thirty persons, will be tested out by the Virginia Railway & Power Company on Floyd Avenue. If successful other lines will be built.

Electric Railway Statistics

Figures Are Given by States and Districts of the Number of Electric Railway Companies Operating, with the Miles of Single Track and the Amount and the Type of All the Rolling Stock Owned by Them

STATISTICS of the miles of track and types of rolling stock of the electric railway companies in the United States have been compiled from the August, 1920, "Electric Railway Directory" of the McGraw-Hill Company and are given in the accompanying table. This information was gathered for the directory in June and July of this year and may be said to represent the statistics of the electric railways about July 1, 1920. This date corresponds to that of a similar table for last year, published on page 56 of this paper for Jan. 3, 1920.

In the compiling of this table every effort has been made to prevent duplication. This was difficult in some cases, where both the holding and operating company had submitted figures covering the same mileage and equipment. The mileage is single track equivalent for all the city and interurban companies, but for the electrified steam railroads their route mileage (aggregating 1,734 miles) was taken. The difference here represents a difference in practice in reporting mileage followed by the steam and electric railways. With the rolling stock, the passenger and freight cars are subdivided into motor and trailer. Service cars are non-revenue cars, such as work cars, snow plows, etc. "Other cars" consist of funeral, sleeping, dining and other miscellaneous cars which cannot be accurately classified.

If the totals of 1920 are compared with those of 1919 a decrease of ten in the total number of companies will be noticed. This decrease represents the companies which have ceased operation. The miles of track show a decrease of 236 from 47,941 miles in 1919 to 47,705 miles in 1920, while the total rolling stock shows an increase of 643 cars from 104,945 in 1919 to 105,588 cars in 1920. The differences in the reports of individual companies to account for these changes can be traced, but owing to probable variations in the methods followed by the companies in reporting, the numerical differences mentioned above are not very significant. Many companies use the terms "express cars," "freight cars" and "service cars" as interchangeable terms.

A short explanation should be made as to the inclusion and exclusion from the table of the freight cars of certain roads. As the primary purpose of the table as regards cars is to give the number in regular electric passenger and freight service, in cases where a company engaged extensively in interchange and had a large number of freight cars in comparison to its passenger cars, the freight cars have, as a rule, been omitted. This step was taken in the case of 1,422 trailer freight cars of the Northwestern Pacific Railroad Company, 2,405 trailer freight cars of the Fort Dodge, Des Moines & Southern Railroad, and 2,809 trailer freight cars of the Long Island Railroad. The 3,000 "other" cars reported by the Chicago Tunnel Company were also omitted. The table includes the 1,171 freight trailers of the Pacific Electric Railway, 510 coal cars of the St. Louis & Bellevue Electric Railway for transporting coal over a line about 17.63 miles long, and 910 freight cars of the Illinois Traction Company.

STATISTICS OF ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

State	No. of Companies Operating	Miles of Single Track	Passenger Cars		Electric Locomotives	Freight and Express Cars		Service Cars	Other Cars
			Motor	Trailer		Motor	Trailer		
New England States									
Connecticut....	8	1,425.83	1,869	98	108	95	22	24	258
Maine	13	519.71	538	10	5	29	80	99	95
Massachusetts.	34	2,887.28	6,411	271	14	216	11	911	125
New Hampshire	11	250.95	290	...	1	1	1	20	14
Rhode Island..	4	422.97	1,082	59	4	34	69	174	5
Vermont......	8	103.13	127	...	4	10	9	11	3
Total.......	78	5,609.87	9,317	438	136	385	192	1,239	500
Eastern States:									
Delaware......	2	158.80	225	98	...	4	1	28	4
D. of Columbia	8	413.30	1,124	263	7	22	41	57	38
Maryland	12	707.70	2,050	59	14	3	48	24	89
New Jersey....	23	1,591.78	3,171	2	2	20	5	318	46
New York.....	84	5,772.34	17,762	1,893	158	160	43	1,083	1,176
Pennsylvania..	101	4,306.69	7,419	129	4	109	115	619	1,575
Virginia.......	12	440.43	775	60	3	16	29	59	6
W. Virginia....	18	670.76	632	23	13	29	4	4[illegible]	59
Total.......	260	14,061.80	33,158	2,527	201	363	286	2,230	2,993
Central States:									
Illinois........	55	3,737.83	5,815	740	53	15	1,967	138	316
Indiana........	30	2,420.03	1,867	64	9	61	439	100	336
Iowa..........	23	946.49	941	60	36	18	400	53	182
Kentucky.....	7	455.60	1,013	22	...	12	27	43	21
Michigan......	24	1,787.00	2,792	70	20	47	332	119	321
Minnesota.....	12	735.33	1,377	14	1	2	...	16	105
Missouri......	22	1,166.80	2,667	174	3	12	15	110	69
Ohio..........	59	4,190.82	5,165	542	28	132	332	520	458
Wisconsin.....	16	767.98	902	112	2	...	...	21	407
Total.......	248	16,207.88	22,539	1,798	152	299	3,512	1,120	2,215
Southern States:									
Alabama......	12	361.98	427	89	1	5	2	27	141
Arkansas......	10	128.80	240	10	...	4	...	2	26
Florida.......	10	218.75	305	11	...	7	21	14	11
Georgia.......	12	487.71	677	43	1	3	22	47	29
Louisiana......	9	322.66	654	51	...	8	1	106	9
Mississippi ...	7	97.87	116	2	2	...	...	...	23
North Carolina	11	302.62	323	13	18	6	177	11	11
South Carolina	4	147.27	187	27	...	...	...	5	18
Tennessee.....	11	453.99	741	100	1	1	2	46	41
Total.......	86	2,521.65	3,670	346	23	34	225	258	309
Western States:									
Arizona.......	4	54.20	52	1	...	...	...	2	...
California.....	35	3,322.03	3,661	317	68	33	1,648	502	140
Colorado......	14	483.94	444	145	8	6	171	43	40
Idaho.........	3	102.20	37	...	...	6	26	...	2
Kansas........	14	515.05	369	45	2	17	88	26	27
Montana......	7	856.56	119	26	89	...	5	15	...
Nebraska......	4	301.96	583	20	1	...	...	6	50
Nevada.......	2	10.80	9	...	...	...	...	...	...
New Mexico...	2	10.95	16	...	...	...	...	...	...
North Dakota	4	27.08	37	24	...	2	...	5	...
Oklahoma.....	16	331.32	292	11	3	2	42	19	64
Oregon........	8	696.18	731	93	24	8	477	129	35
South Dakota .	3	25.85	33	4	...	...	...	1	3
Texas.........	22	1,021.62	1,297	136	1	19	9	79	62
Utah..........	5	448.12	214	40	17	2	73	3	219
Washington....	14	1,073.86	1,129	51	26	39	687	46	146
Wyoming......	2	22.00	15	5	...	...	...	...	4
Total.......	159	9,303.72	9,038	918	239	134	3,226	876	792
Total U. S. 1920	831	47,704.92	77,722	6,027	751	1,215	7,441	5,723	6,809
Total U. S. 1919	841	47,941.45	79,355	4,447	869	866	5,622	3,672	10.114

Total rolling stock, 1920.....105,588 Total rolling stock, 1919.....104,945

This year, as will be noticed, an attempt has been made to separate the "other cars" into the subdivisions mentioned above. Therefore, while the "other" cars have decreased by 3,305 cars, the service, freight and express cars have increased.

In the compilation of this year's table and its comparison with that of last year a few errors, slight in magnitude, were found in the 1919 table. In the comparative figures for the two years given above these errors have been corrected in the 1919 statistics.

Letters to the Editors

Budget Plan in Cincinnati

OFFICE OF DIRECTOR OF STREET RAILROADS

CINCINNATI, OHIO, Dec. 28, 1920.

To the Editors:

The article by Mr. Flint in the current issue of the ELECTRIC RAILWAY JOURNAL is timely. The budget plan of control under the Cincinnati franchise has had two years of trial under the most severe test that could be experienced. Up to the time of its inauguration the Cincinnati Traction Company had not adopted the Interstate Commerce Commission's system of accounting and it was installed simultaneously with the budget.

This of course involved great difficulty in obtaining data from past experience upon which to forecast the probable requirement for the next year. In addition there were sharp fluctuations in the prices of labor and materials and a change in the public works program of the city necessitated track construction on a number of streets not under consideration at the time of the preparation of the budget.

The company opposed the plan in the preparation of the ordinance and at no time had much sympathy with it. I think, however, the officers tried to gather the information as efficiently as possible considering the fact that the experience was new. In spite of these difficulties, I am confident that the results fully warrant the conclusion that the method is not only feasible but far more satisfactory and more easily understood by the public than that of the "car-mile allowance" plan.

The Cincinnati plan provides that forty-five days before the end of the year the company shall submit to the Director of Street Railroads "an estimate of gross receipts and budget of operating expenses for the ensuing calendar year, including the expenses of performing its corporate obligations and maintaining its corporate organization, setting forth an estimate of the total to be expended in the ensuing year under each of the general accounts as provided by the uniform system of accounts for electric railways prescribed by the Interstate Commerce Commission, provided, however, that during the year additional expenditures for such operating expenses may be made upon the approval of the Director of Street Railroads of supplementary estimate or estimates."

It will be seen that the budget applies to operating expenses only, since the other deductions are either specifically set forth in the ordinance or are passed upon separately by the Director of Street Railroads, to whom must be submitted the question of all issues of new securities and authority for capital expenditures.

To meet unforeseen contingencies, the supplementary allowance is provided, and in addition the Director of Street Railroads may authorize transfers from one account to the other. This gives the budget the necessary flexibility provided by monthly budgets.

The Director of Street Railroads must approve or disapprove the budget in ten days. This period is entirely too short, but provision is regarded as directory and not mandatory. Should he disapprove and the company fail to agree the matter may be determined by arbitration.

Although the sums fixed in the budget are by general accounts only, the full detail of the primary accounts is furnished and, under the ordinance, the Director of Street Railroads maintains a continuous audit and has the right to object to the purpose of any voucher. The authority, however, is far from being so complete as that of the Boston trustees. The city has no control over the personnel of the officials of the company. Some details of the actual experiences under the budget plan will point out the factor affecting it and the actual results.

In the year 1919 the actual expenses for way and structures were $111,861.10, or 24.13 per cent, more than the original budget, which was due to street improvements requiring reconstruction of tracks, not contemplated at the time the original budget was fixed. In April, 1919, a supplementary amount of $80,812, or 17.43 per cent, was authorized, and during the latter part of the year an amount of $73,000, or 15.75 per cent, was transferred to way and structures from the accounts "conducting transportation" and "traffic." The city's street improvement program was not completed. This left a balance of $41,950.90 unexpended for way and structures, which was 9.05 per cent of the original budget and 6.79 per cent of the revised estimate.

Equipment expenses increased $29,140.82, or 5.89 per cent, over the budget, principally due to increases in wages of shop employees during the year.

Power expenses were $52,663.29, or 6.19 per cent, more than the budget, attributable to increased cost of fuel and the use of an inferior quality, this situation growing out of the coal miners' strike.

The expenses under "conducting transportation" were $53,513.02, or 1.91 per cent, less than the budget, due in part to the introduction of large cars in place of small ones. During the latter part of the year an amount of $6,600, or 2.37 per cent, was transferred to way and structures, so that the account "conducting transportation" showed a net increase of $12,486, or 0.46 per cent over the original budget.

Traffic expenses were $8,570.75, or 69.68 per cent, less than the budget, of which $7,000, or 56.91 per cent, was transferred to way and structures.

General and miscellaneous expenses increased 5.89 per cent over the original budget, owing to increases in salaries of office employees, cost of printing tickets and injuries and damages.

The total operating expenses for the year were $158,582.73, or 3.12 per cent, more than the budget. Deducting the additional amount of $80,812, authorized in the early part of the year for track construction, leaves $77,770.73, or 1.53 per cent, over the original budget and 1.51 per cent over the revised estimate.

For the first nine months of 1920 way and structures expenses were $38,197.69, or 9.44 per cent, less than the budget. This amount will probably be reduced during the remaining months of the year, as there are several large pieces of track under reconstruction.

Equipment expenses increased $90,805.83, or 20.70 per cent, of which $67,642.35, or 15.42 per cent, is for depreciation of new cars and $7,500, or 1.71 per cent, for increases in wages of shop employees, which were not taken into consideration when the original budget was fixed. This leaves an increase of $15,663.48, or 3.57 per cent.

Power expenses were $162,041.89, or 22.38 per cent high, principally due to the increased cost of coal and increased consumption owing to the receipt of inferior quality purchased from companies other than those delivering coal under contract.

Conducting transportation increased $208,856.71, or 9.96 per cent, of which $135,000, or 6.44 per cent, is attributable to the increase in wages granted employees, effective July 1, 1920, which could not be foreseen in 1919. This leaves an increase of $73,856.71, or 3.52 per cent.

Traffic expenses decreased $1,706.82, or 22.99 per cent, principally due to a decrease in advertising.

General expenses were $1,298.70, or 0.33 per cent, more than the budget, the excess consisting of various small amounts.

The total operating expenses for the nine months of 1920 increased $427,598.62, or 10.60 per cent, over the original budget. Taking into consideration the items enumerated above reduces this amount to $97,317.68, or 2.39 per cent.

It is therefore evident that under normal economic conditions an annual forecast within 3 per cent of the actual could be attained even in the absence of very complete data as to past performances. With the experience that each succeeding budget will afford this variation should be materially improved.

W. C. CULKINS, Director.

Railway President Favors Budget System

THE UNITED RAILWAYS & ELECTRIC COMPANY
OF BALTIMORE

BALTIMORE, MD., Dec. 29, 1920.

To the Editors:

I have read with much interest the article by Mr. Flint appearing in the Dec. 25 issue of the ELECTRIC RAILWAY JOURNAL on the budget system. This article interests me particularly because I established this system on the Boston Elevated when general manager of that property. The system was originally used by the writer when general manager of the Chicago, South Bend & Northern Indiana Railway and later on the Boston & Worcester Street Railway. It is now in use by the United Railways & Electric Company of Baltimore.

Our procedure is as follows: On or before the twentieth of a given month the actual figures for the succeeding month of the preceding year are given to the heads of departments. On or before the twenty-fifth of the month the department heads submit to the auditor their estimated requirements for the coming month. The auditor, in consultation with the president, works up the controlling sheet, estimating as nearly as possible the revenue expected to be obtained. They then estimate such expenditures as they feel can be allowed, meeting, if possible, the estimates of the department heads, but requiring that these estimates be cut if necessary to meet the income.

At an officers' meeting held prior to the first of the month, the estimates and allowances are distributed to the several heads of departments, and the question of the allowances is discussed. About the fifteenth of the month department heads are expected to check up their expenditures to determine whether the allowances are being conformed to. At the same time the receipts are checked up, and if it is found that these are not likely to reach the original estimates a further cut in the budget allowances is made and department heads are expected to meet this during the balance of the month.

After working under this system for the past ten years we feel that it is a great help in working out the financial problems of a company.

C. D. EMMONS, President.

Association News

Committee of 100 Members Appointed

GENERAL GUY E. TRIPP, chairman of the Committee of One Hundred, has announced the personnel of the executive committee of the Committee of One Hundred, as follows:

H. L. Stuart, Halsey Stuart & Company, Chicago, Ill.
Randal Morgan, vice-president United Gas Improvement Company, Philadelphia, Pa.
Arthur W. Brady, president Union Traction Company of Indiana, Anderson, Ind.
Thomas N. McCarter, president Public Service Railway Company, Newark, N. J.
Colonel Philip J. Kealy, president Kansas City Railways Company, Kansas City, Mo.
S. M. Curwen, president J. G. Brill Company, Philadelphia, Pa.
P. H. Gadsden, vice-president United Gas Improvement Company, Philadelphia, Pa.
O. B. Willcox, vice-president Bonbright & Company, New York, N. Y.
Barron Collier, president Barron G. Collier, Inc., New York, N. Y.
Lucius S. Storrs, president The Connecticut Company, New Haven, Conn.
Francis H. Sisson, vice-president Guaranty Trust Company, New York, N. Y.
O. D. Young, vice-president General Electric Company, New York, N. Y.
J. K. Choate, vice-president the J. G. White Management Corporation, New York, N. Y.
J. H. Pardee, president the J. G. White Management Corporation, New York, N. Y.
James D. Mortimer, North American Company, New York, N. Y.
Britton I. Budd, president Metropolitan West Side Elevated Railway, Chicago, Ill.
James H. McGraw, president the McGraw-Hill Company, Inc., New York, N. Y.
Guy E. Tripp, chairman board of directors Westinghouse Electric & Manufacturing Company, New York, N. Y., chairman.

Section in Virginia Reorganized

AT A MEETING held on Dec. 17 the employees of the Newport News & Hampton Railway, Gas & Electric Company reorganized their company section, and judging from the large and enthusiastic turnout they intend to make it a big thing on the Peninsula. J. N. Shannahan, president of the company, explained the purposes of the organization, and H. W. Cox, secretary of the Industrial Y. M. C. A., spoke on welfare work.

E. M. Braxton, attorney for the company, also addressed the section, treating of the employee as the point of contact with the public and the results accruing from the impressions made at this point.

The following officers were then elected: President, E. C. Kelly; vice-president, H. C. McAllister; secretary, J. W. Howard, and treasurer, H. W. Daughtry.

Recent Happenings in Great Britain

Tramway Situation Critical, with Men Demanding Wage Advances and Limit About Reached in Fare Increases

From Our Regular Correspondent

The details given in a report to the British Joint Industrial Council for the Tramway Industry, an abstract of which is included in this letter, show that the industry is in quite as perilous a condition as was the American electric railway industry not long ago. In the face of the new demand for higher wages, the ominous thing is that in many cases it is believed the critical point has been reached, in that further increases of fares will not produce increased revenue. It is not surprising that the tramway companies withdrew from all further negotiations, and that the municipalities refused arbitration. They simply say that they can not pay more. The tramway-operating municipalities have the rates (local taxes) to fall back upon as a last resort, but the companies have no such resource. They are also in many cases suffering from Government delay in granting them authority to increase their statutory maximum fares. Such increase, as indicated above, is often only a forlorn hope.

NO settlement has been reached in regard to the demand from the tramway workers of Great Britain for a further increase of wages of 12s. a week. A month ago I mentioned that when the claim originally came before the National Joint Industrial Council for the Tramway Industry the representatives of the tramway companies withdrew from the Council on the ground that they were unable to pay any further increase. The representatives of the municipal tramway undertakings and of the employees decided to continue negotiations and that their secretaries should carry out an investigation regarding wages, the cost of living, and the financial position of the undertakings. The report by the secretaries was issued on Nov. 13. It revealed a serious state of affairs. To a questionnaire sent out, eight-one municipal tramway authorities employing 47,273 men replied. On Oct. 1, when the cost of living had risen 164 per cent above the pre-war scale, the increases of wages which had been granted amounted to: Drivers, 132 per cent; conductors, 147 per cent; car repairers, 140 per cent; car cleaners, 163 per cent. The working week had been reduced from sixty hours to forty-eight hours.

EARNINGS PER CAR MILE INCREASE

As to receipts per car mile, in 1913-14, forty-seven undertakings earned not more than 11d. per mile run. In 1919-20 there were sixty-one undertakings which earned not less than 18d. per car mile. In September and October, 1920, no undertaking earned less than 15½d. per car mile and only seventeen earned less than 20d. per car mile. Nothwithstanding the increase in receipts, the expenses had gone up so much that the tramway industry of the whole country was being carried on at at loss of at least £1,556,000 during the last financial year.

The application now made for increased wages would involve a further wages charge of about £1,481,000, equal to 1.59d. per car mile. Taking the current financial year, the estimated loss on working was £3,310,000, and with the additional charge now demanded the loss would be £4,793,000. The actual revenue at present was 3.55d. per car mile less than the expenditure, and with the new demand it would be 5.14d. This was a condition of affairs under which no industry could survive. Out of ninety-eight local authorities working tramways, down to Oct. 26 twenty-five had applied to the Ministry of Transport for orders to increase their statutory maximum charges.

This report came before the Joint Council on Nov. 17. The employers' representatives were of the opinion that whatever increased fares might be charged no increased revenue would result as the economic limit had been reached. They therefore declared that they were unable to accede to the wage application or any part of it. The trade union representatives then proposed arbitration and the meeting was adjourned to allow the opinion of all municipal tramway authorities to be taken on the proposal.

The Joint Council met again on Dec. 7, when all negotiation broke down. It was reported, as the result of the referendum, that the majority of the municipal tramway authorities in the country would not consent to submit the wage claim to arbitration because if any advance in wages was granted by an arbitrator they could not afford to pay it. No local authority was in favor of the advance, though a minority of them would have agreed to arbitration. As soon as this result was announced, the meeting of the Council broke up.

At the time of writing the prospect is that there will be no general tramway strike, as it has been made abundantly clear that strike or no strike the concession cannot be granted, for the money for the purpose does not exist. The municipal undertakings do not intend to give advances which would have to be charged on the rates (local taxes), and the companies have no funds for the purpose. It is something gained that a dead-end has at last been reached, and if the employers now stand firm in their present position there will be no further increases of wages.

An impudent attempt by Edinburgh tramway employees to dictate to the management has failed. The men put an embargo on passengers standing in the cars, basing their action on an old regulation of the horse-car days. Their object evidently was to require the use of more cars and more men. The Town Council, which owns and works the tramways, stood firm and threatened the men with dismissal. The public were put to great inconvenience during the rush hours. As the men had not submitted any grievance for consideration by the Joint Industrial Council for the industry, the Town Council resigned from that organization.

MEN TAKE ARBITRARY STAND

On Nov. 15, following the dismissal of several men who persisted in refusing to allow passengers to stand, the employees went out on strike. On the following day the manager was able to run a limited service, and on Nov. 17 the strikers returned to work. In doing so they acted on the advice of the local trades council. In this they showed wisdom, as the Town Council and the management were absolutely firm and were prepared to engage as many new men as necessary. Applicants for the jobs were plentiful.

Mr. Pick and Mr. Shave, of the London General Omnibus Company, in their paper on motor omnibus working and possibilities, presented at the recent congress of the American Electric Railway Association, referred to the fact that a new and enlarged type of omnibus was about to be tried in London. The first of these vehicles was put on the streets during November for trial and demonstration trips. This "S type" 'bus is 24 ft. 7 in. long, 12 ft. 3 in. high, 7 ft. 1 in. wide, and has a wheel base of 14 ft. 11 in. The engine is similar to that used on existing omnibuses. It develops 34 hp. when running at 1,000 r.p.m. The important point is that the body has been designed to seat fifty-seven passengers—twenty-nine inside and twenty-eight on the roof—thus rivalling a tramcar in capacity. The previous type seated forty-six, and the one before that thirty-four. The weight unloaded is slightly increased, but the body is only 2 ft. 2 in. longer than that of the forty-six-seater.

OMNIBUS BILL LOST

Disaster has once more overtaken the efforts of the London County Council to get Parliamentary powers to run omnibuses. The bill for this purpose was passed by the House of Commons, but when the bill came before a committee of the House of Lords in the latter part of November the London General Omnibus Company renewed its determined opposition to the matter and contended that if there was any need for the proposed omnibus services they would supply it. The Lords' committee declined to sanction the proposal in the bill.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Reply on Lease First

Detroit United Railway Indicates City Must Answer that Proposal Before Sale Is Discussed

In reply to the communication from the officials of the city of Detroit, Mich., asking the Detroit United Railway to name a price at which it would sell certain of its lines to the city, Elliott G. Stevenson, attorney for the company, replied that until the city officials deal with the proposition which the company has already submitted, namely, that of leasing the entire system, the company did not care to enter into any further negotiations.

SERVICE-AT-COST PLAN VOTE

The statement is repeated that the company will not enter into any agreement that would either directly or remotely recognize the claimed right of the city to proceed to acquire a municipal railway system under the proceedings culminating in the election of April 5. The company could not be so inconsistent as to enter into negotiations to sell the city part of the lines while challenging the validity of the proceedings and the right of the city to proceed to acquire a municipal system.

It is the purpose of the company to submit to the electors of the city at the approaching April election an initiated ordinance providing for a so-called service-at-cost operation of the street railway system under municipal supervision and regulation along the lines of the ordinance submitted according to the requirements of the City Charter, nearly a year ago to the Corporation Counsel for approval as to form.

The railway, Mr. Stevenson states, is most anxious to reach a solution of the difficulties that prevent the public having adequate transportation, but it has exhausted everything that could be thought of with a view to bringing about that result.

COMPANY OPERATING AT LOSS

If the lease proposal is rejected there remains nothing for the company to do but to submit an ordinance to the people for ratification that will finally settle the question and insure the people the kind of service they need and are entitled to.

Mr. Stevenson states that inasmuch as the commission has had auditors in its office for more than six months with the company's consent checking receipts and expenditures on account of operation, etc., the commission has probably been advised as to the fact that the operations of the company's city system are being conducted at a loss. This situation influences the company to say that no proposition will be taken up other than the one submitted at the present time. If that is not accepted, the company will, it is stated, be compelled to take the other step indicated, and in the meantime ask the Court to fix in the pending proceedings before Judge Jayne an increased rate of fare—probably 6 cents with 1 cent for a transfer—to enable the company to operate without loss. Existing conditions impel the company to have the negotiations that are now pending brought to an early conclusion.

In reply the Street Railway Commission has repeated the request that the Detroit United Railway put a price on the lines which the city would take over. The company maintains that no different answer can be given to this request than was given at first.

Following the refusal of the company to set a price at which it would sell these lines, and the letter to the Street Railway Commission saying that the company was losing money, a letter was sent to the heads of the unions announcing the company's intentions to reduce wages of the platform men, effective on Jan. 1.

As was indicated in the ELECTRIC RAILWAY JOURNAL for Dec. 25, this proposal was rejected at a business meeting of the membership of the three locals and copy of the resolution adopted was placed in the hands of E. J. Burdick, assistant general manager for the Detroit United Railway, by Carey Furgeson, business agent for Local 26.

New Orleans Strives for Permanent Settlement

Eight-Cent Fare Will Be Effective Until Next April—Announcement of Policy Expected Jan. 15

Opponents of the increased fare in New Orleans, La., are busily engaged in an effort to have the ordinance granting the increase repealed and the old rate of fare re-established. The attacks on the measure are annoying, but they have little prospect of success. The ordinance as adopted by the Commission Council authorized the company to increase fares from 6 cents to 8 cents. It will not expire until April 22, 1921. At that time the fare will automatically go back to the old rate of 6 cents, and the workmen's wages back to the old scale.

THIS ordinance was adopted by the Commission Council in lieu of the cost-plus plan recommended by the Special Masters, in order to enable the company to meet the demands of the striking employees and to provide funds needed by the company to meet increase in operating expenses caused by higher taxes and advances in the cost of fuel.

The Council approved the increase for a period of six months, during which time it was recommended that the receiver of the company would formulate some plan of action for his future guidance.

One movement to repeal the measure has just received a solar plexus blow. This was a suit brought in the Civil District Court by certain taxpayers of the city to enjoin the Commission Council from authorizing collection of the 8-cent fare. An injunction had been issued by Judge Foster, of the Federal Court, to prevent any interference with the receiver in the 8-cent fare. Counsel for the taxpayers maintained that the action was not against the receiver but against the Commission Council, which was, he alleged, without authority to grant the increase, as the franchises of the several companies embraced in the New Orleans Railway & Light Company specifically fixed the rate of fare at 5 cents.

Judge Fred D. King, of the Civil District Court, in refusing to interfere with the order of Federal Judge Foster declared that the comity existing between the State Court and the Federal Court required him to respect the injunction issued by Judge Foster preventing interference with the collection of an 8-cent fare. In deciding the case, Judge King declared the essential grounds for the nullity of the 8-cent fare ordinance were decided adversely to the taxpayers by the State Supreme Court in a similar suit brought by Black and others against the railways when the fare was increased from 5 cent to 6 cents. In this case, Judge King said, the higher court held that the taxpayers, not having been parties to the contract between the city and the railways, had no legal interest in the matter and, as taxpayers, had no right to interfere or bring the suit.

Counsel for the taxpayers declared, after the decision, that he would make application for a re-hearing and if this were refused, an appeal would be taken to the State Supreme Court.

Another movement looking to the

repeal of the ordinance was by referendum. This campaign was very energetically pursued by a number of influential gentlemen, taxpayers of this city, one of whom was formerly president pro tem of the Senate. The law under which they sought to repeal the ordinance required the sworn affidavits for repeal of 30 per cent of the registered voters of the city. Under the present registration this practically amounted to an election almost, as they will be required to get the petitions of at least 25,000 voters.

They have obtained, so far, by the hardest kind of work and a most strenuous campaign, only 20,000 petitions, so that they still lack 5,000 votes of the goal.

The Commissioner of Public Utilities of the newly elected Council declares that he is studying the situation with the view of settling the railway matter, but is not yet ready to express his views. The Association of Commerce has also taken the matter up and is about to adopt general rates to guide it in its deliberations and to map out a plan of procedure.

The New Orleans *Times-Picayune*, in a long editorial, urges the new city administration to get to work quickly on some plan that will solve the railway matter. It maintains the time for action is short and that it is distinctly to the interest of New Orleans to see that the following ends are obtained:

1. The railway in the hands of a management possessed of the public's confidence.
2. The public paying a fare which it is convinced is no more than the costs of wise operation and sound capital make necessary.
3. The corporation earning a legitimate return upon a capitalization which the community knows is likewise legitimate.
4. The employees content with their work and wage and assured of permanent positions.

It is said the receiver is working diligently with the operating management of the company toward the desired end but that no announcement of policy will be made before Jan. 15. The complaint is made that the 8-cent fare which was expected to yield $1,500,000 annually will not show a greater revenue than $1,300,000. The loss of revenue from short hauls has exceeded expectations.

Reorganization of International Association

The International Street & Interurban Railway Association, with headquarters at Brussels, has just issued a circular explaining that certain objections had been raised to the proposed reorganization of the association. The reorganization proposed was to dissolve the association and then immediately reorganize it with a membership confined to countries which participated on the allied side or were neutral during the recent war.

The objections which were raised to this plan were that such a procedure would be illegal under the Belgian law unless a referendum was taken of all of the former members of the association. To this point the officers of the association reply that a general statute authorizing such action is now under consideration in the Belgian parliament and the proposed action will be taken after the passage of this act.

Although the association has lost many members, particularly in Russia, its membership now numbers 250. The association had hoped to hold a meeting in Brussels this year, but the plan had to be abandoned because of the difficulties of traveling for those residing at a distance from Belgium.

Toledo Candidates Narrowed

Only Three Names Remain in the Race for Railway Commissionership— Railway Man Considered

The board of sinking fund commissioners of the city of Toledo, Ohio, is considering at present several names as possible appointees to the board of directors of the new Community Traction Company, one of the members of which is to be selected by that body to represent the city.

Under the provision of the service-at-cost ordinance for retiring bonds of the company common stock is issued to the city as each unit of bonds is retired. As it acquires common stock ownership of the railway the city will be represented on the board of directors. The membership of the board is five at present. Four of these members will be company representatives.

COMMISSIONER'S SALARY PROBABLY $10,000

It is thought the sinking fund commissioners will name one of their own number or a member of the board of control. At the meeting on Dec. 28 the board decided to ask Mayor Cornell Schreiber for a legal opinion on the duties and qualifications of the man to be appointed.

The sinking fund commissioners are Edward Kirschner, vice-president of the Ohio Savings Bank & Trust Company; Rollin H. Scribner, manager of the investment department of Secor, Bell & Beckwith; W. Lockwood Lamb, cashier of the National Bank of Commerce; and Johnston Thurstin, attorney.

Mr. Thurstin was a member of a street railway commission which at one time drafted a community ownership solution for the settlement of the traction problem.

At a meeting of the street railway board of control last Monday it was decided that a practical street railway man would probably be the choice of the board for transportation commissioner. It was also decided that his salary would probably be $10,000 a year. The selection has narrowed down to about three of the dozen or more applicants. The appointment will probably be announced about the middle of January, members of the board declared.

It is thought now that the legal work of separating the railway property of the Toledo Railways & Light Company, from all of the company's many other interests will be completed so that the transfer to the new system of operation may be made about Feb. 1.

Wage Conference Planned

Full and Frank Discussion of Reduction of Trainmen's Pay Planned at Detroit

A communication sent to the officials of the Detroit (Mich.) United Railway after W. D. Mahon, international president of the amalgamated, had conferred with executives of the union on the proposed reduction of approximately 20 per cent in the wages of the platform men, signified that the men were willing to meet the company officials to discuss the subject. Their refusal to accept the lowered scale of pay was repeated.

MEN QUESTION REDUCTION IN COSTS

In the letter in answer to the Detroit United Railway's request that the men meet the company to discuss the wage question further, it was stated that members of the union were fully informed as to the facts when they voted against accepting the proposed cut in wages. The comments of E. J. Burdick, assistant general manager of the railway, relative to living costs and street railway men's wages during the war period are questioned by the men.

The company maintains it is unfair that car riders while submitting themselves to cuts in wages and working hours should be asked to pay an increase in the rate of fare in order that the motormen and conductors alone should be gainers. Moreover, the company has been quite seriously affected by the changed economic conditions.

Exception is taken to the company's statement that prices of food stuff, clothing, shoes and household furnishings have fallen to such an extent that present necessities can be met with a decreased wage scale. The men claim that the present scale is required as a minimum.

The company states that salaries of the executive officers have been voluntarily reduced, effective the first of the new year. At a meeting of the heads of the departments it was decided that salaries and wages all along the line are to be decreased. The public has been informed of the steps being taken to reduce the wage scale of conductors and motormen throughout the system to a level more in hormony with not only the decrease in living cost but comparative with the wage scales being adopted in other fields of labor.

AMICABLE ARRANGEMENT EXPECTED

The company expresses the hope that the employees will, after thoughtful deliberation, realize that it is only proper that they, too, cheerfully accept a reduction in the wage scale because such reduction is inevitable under existing conditions.

Willingness to meet and discuss any subject that is of interest to the men and the company is expressed by the men. It was repeated that they were ready for a full and frank discussion of the matter.

Removal of New Jersey Commissioners Sustained

Ousting of the Board of Public Utility Commissioners by Governor Edwards of New Jersey for "misconduct and neglect of duty" was upheld on Dec. 27 by the Supreme Court in an opinion handed down at Trenton. The decision overruled a demurrer filed by the board. It upholds the constitutionality of the section of the public utilities law giving the Governor power to remove from office upon charges and holds that in conducting the proceedings provided by law the Governor is not bound to observe any particular form so long as the proceedings are substantially in compliance with the statute.

The practical effect of the decision, unless reversed on appeal, is to remove from office President John W. Slocum, Andrew Gaul, George F. Wright and Harry L. Knight, who have continued to exercise the functions of public utility commissioners notwithstanding their removal from office by the Governor, whose appointment of new commissioners has not been acted upon by the Senate.

Immediately upon receiving word from Trenton that the Supreme Court had upheld the Governor Josiah Stryker, of Lindabury, Depue & Faulks, who represented the utilities commissioners in the ouster proceedings, stated that an appeal would be taken to the Court of Errors and Appeals.

The nominees of the Governor for the new board are: James A. Hamill, of Jersey City; Treadwell Cleveland, of Newark; former State Senator James A. C. Johnson, of Englewood; State Highway Commissioner Walter F. Whittemore, of Newton, and Arthur A. Quinn, of Perth Amboy, president of the State Federation of Labor.

Permanent Reconstruction Urged

In a letter to the City Council, D. W. Henderson, superintendent of the Seattle (Wash.) Municipal Railway, makes an urgent plea for the permanent reconstruction of the paving on First Avenue and First Avenue South and the rebuilding of the railway tracks at an estimated cost of $350,000. Mr. Henderson declared that operation of the municipal lines over the street between Pine Street and Atlantic Street was virtually impossible, owing to the destructive effect of the bad tracks on the rolling stock.

Mr. Henderson advised that temporary repairs to improve the tracks would cost $21,225, if made now, and would have to be done over again in two or three years, unless the entire street was repaved and new tracks laid. It was pointed out that the cost of repairs and financial loss to rolling stock due to breaking of truck frames on sagging rail joints, and injury to the whole cars from the constant jarring was excessive. Mr. Henderson's letter was referred to the streets and sewers and utilities committees.

News Notes

Miami a Prospective Buyer.—The Miami (Fla.) Traction Company is preparing to sell all its railway equipment to the city. The company has not operated its lines since Oct. 19, when a fire occurred which destroyed the carhouse and all the cars. The company operates 5 miles of single track. It has a capital stock of $250,000.

Gretna-Algiers Men Return to Work.—The platform men of the South New Orleans Light & Traction Company, New Orleans, La., who struck recently for a wage increase voluntarily returned to work on Dec. 24 at the old wage scale of $96 a month. A new agreement was entered into between the men and the representatives of the union whereby the old pay scale will obtain until Dec. 24, 1922, unless in the meantime the Jefferson officials authorize the railway to increase its fare. In that event the wage demands of the men will be adjusted. The company's petition for an advance in fares was rejected recently by the police jury of Jefferson Parish.

Charges Quashed.—Charges pending against Julius Caesar Jackson, Edgar C. Kerwin and William Ems, former employees of the United Railways, St. Louis, Mo., in connection with the loss of United Railways referendum petitions in June, 1918, have been *nolle prossed* by Assistant Circuit Attorney F. E. Williams at St. Louis. The cases were dropped by the Circuit Attorney's office because of the ruling of the Circuit Court at Springfield, Mo., during the trials of Richard McCulloch and Bruce Cameron to the effect that the referendum petitions had no value, hence could not be the objects of larceny. It had been anticipated that these cases would be dismissed.

Municipal Undertaking in Greenville.—Citizens of Greenville, Tex., in a referendum election on Dec. 18 voted to retain the city railway system and to operate it under municipal ownership. The property had been purchased by the city and there had been much agitation over the question of a municipally-owned automobile bus line to take the place of the railway. It was proposed to junk the line and equipment of the traction company and sell it for whatever it would bring and then to invest the proceeds in an automobile bus line, but the bus line proposition was rejected in the referendum and the railway will be retained. Greenville is the only city in Texas which owns its railway system.

Paving Question an Issue in Aberdeen.—Permission granted to the Grays Harbor Railway & Light Company, Aberdeen, Wash., to use planking instead of paving certain street trackage in the city has been withdrawn by the City Council, following protests by property owners on Curtis Street, who contend that the company should stand street improvement expenses exacted of individual tax payers. The matter has been before the Council on two occasions. The latest development is a resolution adopted by the Chamber of Commerce, asking the city to re-issue the permit on the ground that the expense of regulation paving would prove a hardship on the company in its present financial condition. When asked to pave Curtis Street trackage to conform to other streets the railway filed a demurrer, alleging that the profits of the company for the past year had been small, and that the work could not be afforded.

Shopmen and Other Mechanics Seek Increase.—Col. A. T. Perkins, general manager under the receiver of the United Railways, St. Louis, Mo., has filed a number of exhibits with the Missouri Public Service Commission tending to show that the company is now paying its shopmen, electrical workers, painters, carpenters, bridge and structural iron workers, as high wages as the average paid in St. Louis. The employees enumerated are seeking an increase in wages of 45 per cent. All the rates requested are based on an eight-hour day with double pay for overtime and a half day off Saturday. The electrical workers are now working on a twelve-hour basis. Sixty cents an hour is the lowest rate asked and $1 an hour is the highest. A former order of the court permits the State Public Service Commission to act as a board of arbitration in wage disputes. It is on the assumption that they will act in this case that the petitions have been filed.

Children "Kidded" in Vancouver.—The children of the office employees of the British Columbia Electric Railway, Vancouver, B. C., jammed the head office building of the company on the afternoon of Dec. 18 at the second Christmas entertainment held by the office employees' association of the company. Santa Claus arrived through the chimney and, with the help of Mrs. George Kidd, wife of the general manager of the company, distributed presents to every one of the 300 youngsters who filled the fourth floor of the building. There were four Christmas trees laden with presents. A fund of $350 was raised by popular subscription from the office staff, to which the management of the company contributed generously. Then a committee bought presents for every child whose name was obtainable. Taking an active part in the festival also were George Kidd, general manager; W. G. Murrin, assistant general manager, other company officials and Mrs. Murrin. The festivities for the day were concluded with a dance for the older members of the official family of the company, including the employees.

Financial and Corporate

Big Gain in Net Income

West Jersey & Seashore Railroad Changes from Deficit of $85,000 in 1918 to a Profit of $10,000 in 1919

The financial report of the West Jersey & Seashore Railroad for the year ended Dec. 31, 1919, showed a remarkable increase in all items. The revenue from the operation of the railway was $11,971,021. This in comparison with $10,599,543 in 1918 showed an increase of $1,371,478, or 12.9 per cent. Railway operating expenses increased to $11,145,020. This was an increase of $1,039,160, or 10.3 per cent, over 1918. In 1919 the net operating revenue was $826,001, which, in comparison with $493,683 in 1918, shows an increase of more than 67 per cent With this increase in net operating revenue, the taxes being increased only about 19 per cent, the operating income for 1919 increased to $245,968, or more than thirty-three times as much as in 1918.

The net income transferred to profit and loss, according to the income statement of the federal operation, was changed from a deficit of $85,369 to a profit of $10,958, or a betterment by 112 per cent.

As previously mentioned, the West Jersey & Seashore Railroad was under federal control and the annual compensation paid for the possession, use and control of the property was $952,682. This sum, together with other corporate income, gave a gross income for 1919 of $1,212,433, or an increase over 1918 of 12.2 per cent. The net income, according to the income statement of the West Jersey & Seashore Railroad was $698,859, an increase of only 1.8 per cent. This increase allowed a balance of $22,877 to be transferred to profit and loss for 1919. In 1918 only $13,412 was transferred, so an increase of 70.6 per cent was registered in 1919 in comparison with 1918.

14,762,658 REVENUE PASSENGERS

The total revenue passengers carried in 1919 were 14,762,658, or an increase of 1.1 per cent over 1918. The passenger revenue increased by 17 per cent, the revenue for 1919 being $7,563,634. This increase in revenue was due to the fact that the average revenue per passenger increased from 44.3 cents in 1918 to 51.2 cents in 1919. This was an increase of 6.9 cents, or 15.5 per cent.

INCOME STATEMENT OF THE FEDERAL OPERATION OF WEST JERSEY & SEASHORE RAILROAD

Year ended Dec. 31	1919	1918	Percentage Change Over 1918
Revenue from transportation	$11,712,816	$10,398,401	+12.6
Revenue from other railway operations	258,205	201,142	+28.4
Total railway revenue	$11,971,021	$10,599,543	+12.9
Way and structures	$2,314,978	$2,511,140	—7.8
Equipment	2,443,484	1,920,826	+27.2
Traffic	98,811	91,905	+7.5
Conducting transportation	5,961,368	5,284,564	+12.8
Miscellaneous operations	66,676	58,526	+13.9
General	260,165	238,912	+8.9
Transportation for investment—credit	462	13	......
Total railway operating expenses	$11,145,020	$10,105,860	+10.3
Net operating revenue	$826,001	$493,683	+67.3
Taxes assignable to railway operations	$578,874	$483,383	+19.7
Uncollectable railway revenues	1,159	3,159	—63.3
Expenses assignable to railway operations	$580,033	$486,542	+19.2
Operating income	$245,968	$7,141	+33 40
Deductions from gross income:			
Net hire of equipment — Dr. balance	$94,558	$32,799	+188.2
Net joint facility rents — Dr. balance	156,805	143,262	+9.5
Net miscellaneous income — credit	16,354	83,551	—80.3
Total deductions from gross income	$235,009	$92,510	+153.9
Net income transferred to profit and loss	$10,958	*$85,369	+112.7

*Deficit

INCOME STATEMENT OF WEST JERSEY & SEASHORE RAILROAD

Year ended Dec. 31	1919	1918	Percentage Change Over 1918
Compensation accrued under federal control for possession, use, and control of property of this company	$952,682	$952,682	..
Other corporate income	259,751	137,509	+88.9
Gross income	$1,212,433	$1,090,191	+12.2
Deductions from gross income	513,574	403,471	+27.5
Net income	$698,859	$686,720	+1.8
Disposition of net income	$675,982	$673,308	+0.4
Balance transferred to profit and loss	$22,877	$13,412	+70.6
Total amount to credit of profit and loss	$408,977	$375,938	+8.8

STATISTICAL INFORMATION — WEST JERSEY & SEASHORE RAILROAD

Year ended Dec. 31	1919	1918	Percentage Change Over 1918
Miles of single track	361.18	361.18	....
Train miles:			
In passenger service	3,129,331	3,017,431	+3.7
By freight service	474,060	604,542	—21.6
Total revenue mileage run	3,603,391	3,621,973	—.5
Revenue passengers carried	14,762,658	14,603,466	+1.1
Passenger revenue	$7,563,634	$6,464,198	+17.0
Passenger revenue per cent of total operating revenue	63.18	60.99	+22
Passenger revenue per miles of line	$20,941	$17,897	+17.0
Average revenue per passenger (cents)	51.2	44.3	+15.5
Average miles each passenger was carried	26.70	25.13	+6.2
Average number of passengers per car-mile	29	31	—6.5
Statistics per train mile:			
Operating revenue	$3.32	$2.93	+13.3
Operating expenses	$3.10	$2.79	+11.1
Net operating revenue (cents)	22.9	13.6	+68.3
Number of passengers	4.10	4.03	+1.7
Train miles per revenue passenger	0.244	0.248	—1.6
Operating ratio (per cent)	93.2	95.4	—2.2

Suburban Line Threatens to Suspend

The Syracuse & Suburban Railway, which operates between the town of Manlius and the city of Syracuse, N. Y., will cease to operate unless something is done to reduce operating expenses and overcome burdensome franchise obligations.

C. Loomis Allen, vice-president of the road, consulted recently with John J. Stanley, Cleveland, the president of the company, about the situation. Subsequently he said the fate of the Syracuse & Suburban Railway was up to the people.

Letters telling of the tenative plans to suspend operations were forwarded to the town and village officers of Manlius, Fayetteville and Dewitt, stations on the suburban line, which supply the chief sources of revenue.

Various suggestions have been made by village officials and by citizens of the city of Syracuse, among them one to the effect that the salaries of the officers of the road be reduced. Mr. Allen said:

> The matter is in the hands of the people. It is very simple. We are very barely earning our taxes and cannot increase our revenues. Fares are too high now. The only solution is to reduce expenses and the only way to do that is to get relief from burdensome franchise obligations and operating costs.

It has been intimated that bus line service will be established between the towns and city if the railway service is suspended. Mr. Allen stated that the company would voice no opposition to such action.

Included in the system of the Syracuse & Suburban Railroad are 18.5 miles of line.

$34,674,000 Cut in Capitalization

Financial Readjustment Without Foreclosure Approved by Commission to Permit United Railroads to Meet Its Obligations

An order signed by the California Railroad Commission on Dec. 22 approved the reorganization plan for the United Railroads, San Francisco, Cal., proposed by the committee named to study the affairs of the railway. If the plan is carried out the present outstanding bonds, notes and stocks will be reduced from $82,190,600 to $47,516,000, or $34,674,000. The indebtedness will be reduced from $39,242,000 to $15,366,000, or $23,876,000. The capital stock will be reduced from $42,948,600 to $32,130,000, or $10,798,600. The annual interest charges will be reduced from approximately $1,815,000 to $820,300, or $994,700.

THE plan which has met with the approval of all but holders of $603,000 of bonds, or 99.199 per cent of the security holders, calls for taking over of the United Railroads by the Market Street Railway and the issuance by the Market Street Railway of the following securities:

5% bonds due Sept. 1, 1924	$10,166,000
6% notes due Sept. 1, 1924	5,200,000
6% prior preference stock	11,750,000
6% preferred stock	5,000,000
6% second preferred stock	4,700,000
Common stock	10,700,000
Total	$47,516,000

The primary reason for the reorganization is given by the Railroad Commission in its review of the plan as inability by the United Railroads "to pay matured bonded indebtedness and interest on outstanding indebtedness."

The bonded and note indebtedness of the United Railroads is as follows:

Bonds	Amount Outstanding
Market St. Cable Co. 6s	$1,800,000
The Omnibus Cable Co. 6s	2,000,000
Ferry and Cliff House Co. 6s	400,000
Sutter St. Ry. Co. 5s	1,000,000
Market St. Ry. Co. 5s	6,641,000
United R. R. 4s	23,500,000
S. F. Elec. Ry. 5s	191,000
Gough St. R. R. Co. 5s	45,000
Total	$35,577,000
Notes	
Seven per cent	$1,925,000
Six per cent	740,000
Five per cent	1,000,000
Total	$3,665,000
Total bonds and notes	$39,242,000

The bonds of the San Francisco Electric Railways, $191,000, will be paid for in cash according to the reorganization plan, as will also the bonds of the Gough Street Railroad, amounting to $45,000. The $6,641,000 of Market Street Railway 5 per cent bonds will remain outstanding.

There are $23,500,000 of 4 per cent United Railroads bonds outstanding. Under the reorganization plan, the holders of these bonds will receive 15 per cent in Market Street Railway 5 per cent bonds, 50 per cent in prior preference stock, 5 per cent in preferred stock, 10 per cent in second preferred stock and 20 per cent in common stock.

The holders of United Railroads notes and stock totaling $46,613,600, will receive of Market Street Railway Company $3,625,000 preferred stock, $2,550,000 second preferred stock and $6,000,000 common stock.

The commission points out that in 1918, the United Railroads reported railway operating revenues of $7,510,894; operating expenses $5,031,683, giving a net operating revenue of $2,479,210. Deduction of taxes amounting to $408,000 left $2,071,210, as operating income. In 1919 the operating income was $2,054,397, the taxes amounting to $468,800. The 1919 operating revenue was $8,629,347; operating expense, $6,106,149; net operating revenue, $2,523,197.

Both the United Railroads' engineers and the commission's engineers filed an appraisal of the properties. A. L. Black, for the company, fixed $60,090,893 as the reproduction cost new of the properties as against the commission's appraisal of $51,856,218, a difference of $8,234,675. Against the commission's appraisal of reproduction cost new, less depreciation, of $41,424,961, the company gives $52,210,195, a difference of $10,765,234. The commission's figure of $30,806,514, historical cost new, is $5,023,878 less than Mr. Black's figure under the same heading.

These differences are due to the use of different unit prices and to direct and overhead allowances. All appraisals are as of June 30, 1920. In estimating the reproduction cost new both the commission and the company assumed a three-year construction period and applied to the inventory what they regarded as average prices for the three-year period ending June 30, 1920. In arriving at the historical cost effect was given by the commission to the prices prevailing at the time the properties were built, in so far as such prices were available.

Losses Allowed to Be Amortized

Decision in Valuation and Rate Case of Gas Company Contains Many Important Points

Losses amounting to $118,000 in the operation of the Nashville Gas & Heating Company since July 1, 1919, are permitted by the Tennessee Public Utilities Commission to be amortized over a period of ten years and a fair return under present conditions is fixed by the commission at not to exceed 7½ per cent and not less than 6½ per cent on the value of the property devoted to the public use. These are among some of the outstanding features of a decision rendered recently in a gas rate case of more than passing interest.

ANOTHER feature of the opinion is the attention directed by the commission to the fact that for every $1 that the consumer pays to the company for gas during 1921 the city of Nashville will get approximately 12 cents and the company 88 cents. The commission points out that this is a matter over which it has no control, but that so long as the city demands and collects these amounts as taxes the commission can under the law only allow them to be charged to operating expenses. This, of course, results in the payment being made indirectly by the consumer.

The rates for gas as fixed under the order are $1.90 gross per 1,000 cu.ft. and $1.80 net, the net rate to apply only to the patron who pays his bill within ten business days after the bill is rendered.

Experts made three estimates of the value of the property of the company. These were $2,508,665 as historical cost less depreciation, $3,569,990 as cost to reproduce new less depreciation based upon average prices for 1915-1919, and $4,655,380 as the cost to reproduce new less depreciation based upon present prices. The value as fixed by the commission is $2,650,000.

On this point the commission says that the public should not be made to bear the entire burden of the abnormally inflated present day prices of both labor and material as a rate of return upon a value reached alone by such method would be prohibitory. On the other hand, the company should not be made to bear the burden of too low a valuation based upon an estimate of its original cost less depreciation, as a return upon a value reached alone by such a method might prove confiscatory.

No dividends have been paid by the company since its reorganization in 1912; neither has the company earned interest on its bonded indebtedness of $2,000,000 since that date. Interest on the bonds for the period mentioned was $833,333 and net earnings for the period $722,862, making the deficit $110,471.

The company is directed to reinforce its service in the outlying residential districts so as to furnish an adequate and even flow of gas at all times, with its first available earnings over and above the 6½ per cent return per annum on the investment and the amount set out with which to amortize its losses since July 1, 1919, and is to pay no dividends until this work is finished.

The company is directed to establish and maintain a depreciation or renewal and replacement reserve, said reserve to be credited each month with $\frac{1}{10}$ of 1 per cent of the value of the depreciable property of the company as of April 1, 1920, plus such amounts as have been or may be added and minus such amounts as have been or may be deducted after April 1, 1920.

Receiver in Denver

Ernest Stenger, Successor to Mr. Hild as Operating Head of Tramway, Named Under Court's Direction

On application of the Westinghouse Electric & Manufacturing Company made Dec. 24 Ernest Stenger, president, was appointed receiver for the Denver (Col.) Tramway by Judge Lewis of the Federal court. The application was premised on an overdue account of the Westinghouse Company for $13,577 incurred for materials and supplies furnished the tramway, which was unable to pay.

The application for the receiver sets out that the company has overdue and unpaid bond and note interest aggregating $346,800; deliquent and unpaid taxes in Denver County of approximately $95,000; unpaid and overdue accounts for materials and supplies in a sum in excess of $150,000, and in addition has no funds with which to meet taxes, approximately $300,000, payable in 1921; that the operating expenses, due largely to increases in wages of employees and costs of materials, during the year 1919 were more than 100 per cent greater than prior to the war and that wage increases alone were more than $1,000,000 a year greater than before the war, while the fare increase had been only 20 per cent, with the result that for the year 1920 the company's net earnings were less than half the fixed charges on the property.

As a result of these conditions the earnings for the year 1920 will be less than 3 per cent on the valuation of the property as found by the Public Utilities Commission of the State of Colorado and approved by a committee of fifty-five representative citizens of Denver. On account of the company's inability to obtain higher fares the continued operation of the properties as a unit and the rendition of proper service to the public is seriously threatened and crippled and the financial situation and conditions are such that the applicant company felt a receiver should be appointed so that the court may fully administer the property and funds of the company.

Receiver Stenger made no comments on his appointment or the future policies of the company other than to say that for the present there will be no material changes in either the personnel of the company or in the compensation and wages paid.

100,000,000 Passengers During 1920

One hundred million passengers will have been carried over the lines of the Pacific Electric Railway, Los Angeles, Cal., at the close of the year 1920, according to estimate given out by H. B. Titcomb, vice-president of the interurban company. This estimate, Mr. Titcomb states, is based on the actual volume of traffic that has been handled during the first ten months of the current year, and will constitute for the year 1920 the greatest volume of business handled in the history of the company. The highest previous mark was made in 1913. In that year 83,000,000 passengers were carried.

While reflective to a degree of the greatest increase that has been made in the population of Southern California, Mr. Titcomb points out that comparative figures of the past few years cannot be taken as a true index of increases in population. This, he explains, is due largely to the advent of the automobile, which has made heavy inroads on electric railway transportation.

The Pacific Electric, it is pointed out, up to and including the year 1913, showed a steady and consistent increase in volume of traffic handled. Beginning with the year 1914, however, the popularity of the automobile brought about a decrease in both urban and interurban railway traffic which continued until, for the year 1918, the volume carried over the interurban company's system had dropped to a total of 77,500,000 passengers.

Mr. Titcomb states that the figures of the current year are perhaps more truly indicative that the peak in automobile transportation has been reached. He is of the opinion that rising costs of automobiles and of gasoline have been so greatly out of proportion to such increases as have come about in electric railway fares that he is firmly of the belief that electric railways will have little hereafter to fear in obtaining their just proportion of the increased travel.

St. Paul Valuation Protested

Exception to the valuation of $11,000,000 placed on the property of the St. Paul (Minn.) City Railway and filed with the City Council by E. W. Bemis is taken by President Horace Lowry, of the Twin City Lines, of which the St. Paul line is a subsidiary. The company has been paying taxes on a valuation of $16,000,000. Mr. Lowry made a statement as follows:

> The Bemis report is apparently very carefully prepared, but from the company's standpoint we are unable to agree that the principles are fair which he has used in arriving at his figures. Our valuation of the property is pretty well expressed by the fact that for several years we have, without protest, paid taxes on a valuation in excess of $16,000,000. It is needless to say that if we figured the property to be worth less money we would have contested paying taxes on this valuation, even to the extent of going into the court.
>
> We have not at hand the full details of Dr. Bemis' report, which are promised at an early date, but as we interpret it the net result of this report is that the company is not at this time even earning the return on the low valuation of $11,000,000, which he has placed on the property, and that the company cannot be expected to make any extensions or undertake any reconstruction or paving until conditions are changed through a readjustment of the rate of fare.
>
> Dr. Bemis feels that a few more weeks should elapse in order to analyze the earnings and expenses under the present 6-cent fare and at that time proposes to re-open the entire question and states that at that time he will make a definite recommendation as to the rate of fare and return on the investment.
>
> At that time the entire question will be re-opened and our company will be prepared to present to the St. Paul City Council its valuation of the property. We believe we can establish a value materially in excess of that proposed by Dr. Bemis.

Financial News Notes

Sale of Real Estate Postponed.—Sale of the real estate of the New York (N. Y.) Railways under foreclosure of the first real estate and refunding mortgage, has been postponed until Feb. 2, 1921, to await action in the United States District Court.

Vermont Company to Increase Stock.—The Burlington Traction Company, Burlington, Vt., has voted to increase its capital stock from $200,000 to $400,000. The company has filed with the Secretary of State a certificate certifying that the additional will consist of 2,000 shares of a par value of $100 each.

Sale for Taxes Threatened.—Harvey P. Cole, collector of taxes for the town of Williamstown, has announced that property owned by the Berkshire Street Railway at Williamstown, Mass., will be offered for sale at public auction on Jan. 8, for the purpose of obtaining payment of taxes owed the town by the company. The amount is $1,216, covering a period of three years.

Change in Tax Basis Suggested.—One of the measures of relief under consideration by Congress for extension to the Washington Railway & Electric Company and other lines in the District of Columbia is the placing of a tax on the net earnings of the railways instead of on the gross earnings as at present. This, it is estimated, would relieve the Washington Railway & Electric Company of $300,000 in charges.

Equipment Notes for One Car.—The Department of Public Utilities of Massachusetts has authorized the receiver of the Brockton & Plymouth Street Railway, Plymouth, Mass., to issue thirty-six notes aggregating $6,360 for the purpose of purchasing a one-man car under a conditional sale contract, the notes to mature at monthly intervals and to be in addition to a cash payment already made in connection with the purchase.

Receiver in Raleigh.—J. R. Baggett, Wilmington, N. C., has been appointed temporary receiver of the Cumberland Railway & Power Company, Raleigh, N. C. After a meeting with the directors of the company Mr. Baggett issued a statement to the effect that with co-operation on the part of officers, directors and bondholders the outlook was good for placing the properties on a paying basis.

Plum Island Line to Be Abandoned.—Operation of the Plum Island division of the Massachusetts Northeastern Street Railway, Haverhill, Mass., will be suspended at once, it is announced, and the tracks taken up. The line connects Newburyport and the island and is the only means of communication for the large number of cottagers who spend the summer at the island. It has not paid expenses for some time.

A $1,500,000 Tax Levy Proposed.—A bill recently introduced in the City Council of Seattle, Wash., by Councilman Carroll, provides for an annual tax levy of not to exceed $1,500,000 to aid in the maintenance and operation of the Seattle Municipal Railway. It provides for submission of the question to the voters at the general election on March 8. The bill was referred to the committee of the whole.

Losing $2,000 a Day.—The United Traction Company, Albany, N. Y., is now operating at a loss of $2,000 a day, according to a recent statement by the company. The deficit for the eleven months ending Nov. 30 is more than $371,000, and the accumulated deficit to that date amounts to nearly $700,000. The company some time ago applied to the Public Service Commission for the Second District for authority to raise its fare from 7 cents to 10 cents.

Webster-Putnam Service to Stop.—The Webster-Dudley Chamber of Commerce has received a letter from the Worcester (Mass.) Consolidated Street Railway and the Connecticut Company stating that the lines between the towns of Webster and Putnam are not to be continued. Both companies claim that the present income on lines in the territory adjacent to Putnam is not producing enough revenue to pay wages of operation.

Local Lines at Findley Appraised at $206,493.—The city system of the Toledo, Bowling Green & Southern Traction Company at Findlay, Ohio, is worth $206,493, according to a report filed by appraisers of the State Public Utilities Commission. The appraisers report will be used in drafting a service-at-cost franchise to supplant the present franchise, under which the company claims it is losing money. An application to discontinue service is now pending before the utilities commission.

How One Municipal Line Makes a Showing.—Through the charging of inadequate fares on the so-called Civic Lines, the city of Toronto, Ont., has been responsible for annual deficits ranging from $78,000 to $146,000, Thomas Bradshaw, ex-finance commissioner of Toronto, told the Chartered Accountants' Students' Association of Ontario. These deficits have been charged up against the general tax rate. In addition, the city has failed to provide for depreciation or taxes on the property.

Mayor Approves Mr. Feustel's Retention.—Mayor Moore of Philadelphia, Pa., has signed a contract with Robert M. Feustel, for services in preparing and presenting before the Public Service Commission the city's case in the Philadelphia Rapid Transit Company valuation proceedings. Mr. Feustel was engaged by the Department of City Transit as the city's representative in checking up the inventory and valuation of the railway property. Reference to the appointment was made in the ELECTRIC RAILWAY JOURNAL for Oct. 9, page 738.

Bonds Extended with Increase in Interest.—The Department of Public Utilities of Massachusetts has approved the extension of maturity date for five years from Jan. 3, 1921, of the $115,000 twenty-year first mortgage 5 per cent gold coupon bonds assumed by the Worcester Consolidated Street Railway from the Worcester & Clinton Street Railway. The interest rate is increased to 7 per cent. The existing financial conditions prevented refunding by a new issue, and the increase in the interest rate is necessary to secure the consent of noteholders to the extension.

New Hampshire Town Votes to Buy Road.—The citizens of Hampton, N. H., have voted to purchase the Exeter, Hampton & Amesbury Street Railway, at a cost not to exceed $80,000, with the understanding that if the road failed to pay expenses the town of Exeter would make an annual contribution of $2,500 for a term of five years. The road connects Hampton with Exeter, Hampton Falls, Hampton Beach and Smithtown in N. H., and Amesbury, Mass., operation being over about 20 miles of track. It was built in 1897.

Unscrambling Impossible. — State Public Utilities Commissioner Joseph W. Alsop, in an address at Hartford on Dec. 20, said that the "unscrambling of the Connecticut Company is impossible under the trusteeship plan." He said that the company did an entirely intrastate business, but was virtually not under the control of the State because of its management by federal trustees. He stated $40,000,000 in stock certificates was represented in the Connecticut Company and it would be impossible under the trusteeship for the trustees to sell the road.

Hyde Park Bill Passed by House.—The Massachusetts House has passed to be engrossed a bill authorizing the Boston Elevated Railway to begin operation at once on the Eastern Massachusetts Street Railway lines in Hyde Park. The bill provides a payment of $30,000 by the city of Boston to the Boston Elevated Railway in order that tracks approaching Hyde Park Avenue may be put in satisfactory condition, and the city also guarantees to make up any deficit in operating expenses on the new line. The city has been ready to pay this money for months, but was unable to do so because of irregularities in a bill passed in the regular session. These irregularities are corrected in the new bill.

Decrease Reported in Spokane in November.—Despite the fact that 72,044 more passengers were carried by the Washington Water Power Company on its city lines in Spokane, Wash., in November, 1920, than in the same month of 1919, the net revenue declined practically $5,000 according to the report made to Mayor Fleming. The gross receipts increased from $55,886 to $90,531 while operating expenses increased from $55,156 to $62,147. The income with the operation charges deducted was $28,383 last month as against $31,729 in the same month last year. Taxes and replacement reserve last month were $21,272 as compared with $19,724. The net earnings last month were $7,111 and in November, 1919, $12,005.

Standard Traction Absorbed.—The Dallas (Tex.) Railway effective on Dec. 1, took over the Standard Traction Company, which had been operating in the Mount Auburn and Parkview additions to the city, connecting with the lines of the Dallas Railway, to which transfers were issued. Under the new arrangement through service will be operated from the business district on both lines with new one-man cars. Twelve of the new cars will be used and a 7½ minute schedule will be maintained. The Standard Traction Company agreed to turn over to the Dallas Railway its property and bonus of $30,000 cash offered for the construction of a line to the two additions via Lindsley Avenue. The Dallas Railway has accepted this offer contingent on the city granting a new franchise. The proposed line would cost about $100,000.

Rental Case to Be Appealed.—Berne H. Evans, counsel for the Public Service Commission of Pennsylvania has announced that the commission would join with the city and business associations in an appeal to the Supreme Court from the decision rendered by the Superior Court in the case of the rentals of the underlying companies included in the system of the Philadelphia Rapid Transit Company. The Superior Court set aside an order of the Public Service Commission which required the underlying companies to reply to the complaint that the rentals they received from the Philadelphia Rapid Transit Company were "excessive and unjust." The Public Service Commission, it was announced, will defend the right of the commission to regulate rentals that have a direct bearing on the rate of fare exacted from the public by the Philadelphia Rapid Transit Company.

Court to Fix Priority of Liens.—In the United States court at Savannah Judge Beverly D. Evans heard the intervention of the city of Brunswick, Ga., in the case of the Columbia Trust Company vs. the City & Suburban Railway, under which the railway at Brunswick was placed in the hands of a receiver about a year ago. The intervention was for the purpose of having the railway's pro rata part of paving costs on streets occupied by its tracks declared a lien on its property. After a short hearing on the intervention Judge Evans announced that he would take the matter under advisement and render his decision later. There was a general discussion of the affairs of the railway, which has been operated at a loss. Various suggestions were made to solve the question so that there might be no necessity for scrapping the system.

Traffic and Transportation

Autos Killed 7,969

Deaths Resulting from Automobile Accidents in Territory Registered by Census Shows Increase

A total of 3,808 persons were killed in automobile accidents or died as a result of such accidents in sixty-six of the larger cities of the country in 1919, according to a compilation recently made public by the Bureau of the Census, Department of Commerce, Washington, D. C. The total number of deaths resulting from automobile accidents throughout the territory registered by the Census Bureau, representing about 80 per cent of the population of the United States, was 7,969. The rate per 100,000 of population in the registration area has not been determined, but the rate for the sixty-six cities is placed at 14.1.

ALARMING INCREASE SHOWN

The Census Bureau's statement points out that this death rate of 14.1 for the cities represents an increase over that for every year since 1915, when the rate was 8.0 per 100,000, and an increase of 245 in the total number of deaths over 1918. It declares that the number of persons killed each year in automobile accidents has reached alarming proportions, and urges that prompt measures be taken to protect pedestrians from reckless motorists. The following suggestions are made for reducing the number of accidents:

1. At street crossings the erection of curbed safety islands, which, at the most dangerous spots, should be very close together.
2. Construction of additional crossings in the middle of blocks, where automobiles can approach from only two directions.
3. Demonstration of great skill in driving each machine before granting a driver's license for that machine.
4. Reduction of the speed limit, especially at crossings.
5. Fine, revoking of license, and imprisonment, each to have its place as an actual penalty.

Referring to the increase in the number of fatalities, the bureau's statement says:

> Each year the death rates from automobile accidents are higher than the rates of the previous year. Each year it becomes more and more dangerous for a person to walk the streets. The reason usually given, and probably the correct one, is that the number of automobiles in use is constantly increasing. How then shall this ever increasing danger be lessened? The obvious remedy is to improve constantly the traffic regulations to keep pace with the ever increasing number of automobiles.
>
> #### STRICTER REGULATION NEEDED
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> This call for better and better traffic regulations is not a fanciful one. Everyone is familiar with the necessity for slow and orderly progress when a crowd emerges from a circus tent and, similarly, automobile traffic must be slowed down and controlled until it becomes safe.
>
> The 1919 rates for Kansas City, Mo., San Antonio and Cleveland—all much lower than for 1918—furnish a ray of hope that we are finally waking up.
>
> The tendency of some writers to exonerate automobile drivers and to place the blame of accidents upon pedestrians indicates lack of a full comprehension of the problems involved.
>
> The teaching of caution is admirable and in time pedestrians will undoubtedly become more and more careful, but there will always be on our streets the person who misjudged the speed of an approaching automobile and becoming confused knows not which way to go; there will always be the child who has not yet acquired the ultra-cautious habit, and there will always be old people who cannot hear and see so well as they used to and who are not so keen and active as they once were. The preaching of more caution to these people will never be sufficient. They must be protected by additional safeguards, and city governments which will continue to make their traffic regulations more and more rigid till they can point to low death rates from automobile accidents will deserve the commendation of all thoughtful people.

YOUNGSTOWN'S RATE 28.5 PER 100,000

Youngstown, Ohio, heads the list of sixty-six cities in the automobile death rate with 28.5 per 100,000, but shows a decrease from the previous year, when the rate was 31.9. Richmond, Va., had the lowest rate with 5.9, but showed a slight increase over 1918, when it was 5.4. New York had the largest total number of deaths with 780, an increase of 89 over the previous year and more than double the number in 1915. New York's automobile death rate was 14 per 100,000 persons. Chicago's total deaths numbered 328, an increase of 37, with a death rate of 12.3.

Statistics compiled by the bureau for other cities of 250,000 or more population follow:

Philadelphia total 191, decrease 35, rate 10.6; Detroit 139, increase 14, rate 14.4; Cleveland 126, decrease 42, rate 16.0; St. Louis 105, increase 12, rate 13.7; Boston 125, increase 17, rate 16.8; Baltimore 106, increase 4, rate 14.6; Pittsburgh 94, decrease 11, rate 16.1; Los Angeles 119, increase 28, rate 21.1; San Francisco 85, increase 11, rate 16.9; Buffalo 68, decrease 22, rate 13.6; Milwaukee 60, increase 12, rate 13.2; Washington 58, increase 4, rate 13.4; Newark 82, increase 20, rate 20.0; Cincinnati 67, increase 8, rate 16.7; New Orleans 36, increase 8, rate 9.4; Minneapolis 38, decrease 5, rate 10.1; Kansas City, Mo., 42, decrease 22, rate 13.1; Seattle 50, increase 10, rate 16.0; Indianapolis 26, decrease 1, rate 8.4; Jersey City 40, increase 10, rate 13.5; Rochester 32, increase 7, rate 10.9; Portland, Ore., 31, no change, rate 12.1; Denver 41, decrease 2, rate 16.1.

Five Cents a Mile

The Public Service Commission for the Second District has authorized the Southern New York Power & Railway Corporation, Cooperstown, N. Y., to file a new passenger tariff, effective on five days' notice, establishing cash, ticket and mileage fares at rates not exceeding 5 cents a mile for travel between Mohawk and Oneonta, excepting in Oneonta. If the company discontinues the sale of mileage books now in use or increases the mileage rate, outstanding mileage books will be redeemed if presented for redemption before the expiration of the book. The increase authorized is for one year or until another order by the commission makes the rate inoperative.

Seattle Increase Soon

Municipal Railway Will Raise Token Rates on Jan. 8—One Councilman Proposes Free Rides

Token fares on the lines of the Seattle (Wash.) Municipal Railway will be increased from 6¼ cents to 8⅓ cents on Jan. 8 by the terms of an ordinance recently passed by the City Council. The new rates provide a cash fare of 10 cents as at present; token fares, 8⅓ cents or three for 25 cents, six for 50 cents and twelve for $1. Fares for school children remain at the present rate: single cash fare, 3 cents; cash fare for two children, 5 cents; school tickets, ten for 25 cents, or 2½ cents each. Former service men under jurisdiction of the Federal Board for Vocational Training will pay the same rates as school children.

Passengers who pay cash, tokens, or school-ticket fares will be entitled to transfer privileges, except that transfers will be issued to the Seattle & Ranier Valley Railway only upon payment of the cash fare of 10 cents. An additional fare will be charged on the Highland Park and Lake Burien line operated by the city for transportation to points outside the city limits, according to D. W. Henderson, superintendent of the municipal railway system.

Mr. Henderson estimates that the increased fares will bring the municipal system to a point where there will be a surplus of $230,000 at the end of 1921. The estimate is based on the assumption that the average number of passengers a month in 1921 under the increased fare will be 7,366,634, the average number which rode on the car lines in August, September and October of this year.

FREE RIDES SUGGESTED

A proposal will shortly be submitted to the City Council by Councilman Oliver T. Erickson, chairman of the judiciary committee, providing for the establishment of a 2½-cent or 3-cent fare on the Seattle Municipal Railway and for the eventual doing away with fares entirely. Mr. Erickson has asked the Corporation Counsel to prepare an amendment to the city charter to put his plan in operation.

Mr. Erickson says the fare would include not more than 1½ cents to be set aside in an extension and depreciation reserve fund for extensions and track and equipment purposes, to be expended by the Council. All other costs of operation and maintenance would be paid from the general fund, increasing the general tax levy about 2 per cent. With the retirement of all outstanding bonds and debts, the collection of this fare would be discontinued, and all costs of construction, operating and maintenance paid from the general fund. Mr. Erickson has long been interested in municipal ownership of the traction system. He believes that the time is approaching when the payment of fares on municipal transportation systems must go the way of tolls on roads and bridges.

One Cent for Transfers in Indianapolis

Commission Grants Railway an Additional Charge for Trial Period—Company Looks for $150,000 Increase in Revenue

The Indianapolis (Ind.) Street Railway on Dec. 20 began charging 1 cent for each transfer, in accordance with an order of the State Public Service Commission issued on Dec. 18. The 1-cent transfer charge was authorized by the commission for a trial period of seventy-one days. In its order the commission intimated that, if the results of operation under the new plan proved unsatisfactory, further relief would be forthcoming. The basic nickel fare was retained as being in the best interest of the community. The company had applied for a 2-cent transfer charge and for an increase in the amounts paid it for the use of the city tracks and for terminal facilities by the interurbans entering Indianapolis. Hearings on the original and supplementary petitions were held by the commission, as reported in the issue for Dec. 18, page 1262. It is estimated by the commission that the 1-cent transfer charge will add $182,000 a year to the revenues of the company. The company's estimate is approximately $150,000.

IN granting the 1-cent charge the commission stated that it sought the most equitable method of relieving the company. With reference to its policy toward the city and the railway, it said:

> The company, from the standpoint of its financial organization and fixed charges, is on a safe and sound basis. For more than two years the company has been very closely regulated by this commission. Methods of operation have been changed at the direction of the commission. Economies and efficiencies have been effected and adopted Under orders of this commission, great improvement in service has been made. New equipment has been added, and the service of the company greatly improved. Needed extensions of lines have been made at the request of this commission. For more than two years this company has made every effort to conform to its obligations as an agency of public service. • • • The citizens of Indianapolis, by the economies and management of the company, have been saved millions of dollars in street car fares as compared to the citizens of the large number of other similar sized cities in the United States.
>
> ### COMMISSION BACKS RAILWAY
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> In view of all this the commission desires to emphasize the fact that during the period of its jurisdiction it intends to stand behind this company to the full extent of the commission's power to maintain the solvency and credit of the company and to protect its property and interests, provided that the company continues to exercise its best efforts to meet the legitimate demands of the public.
>
> The commission also finds it desirable to state to the city that its legitimate needs may be taken care of. The commission will recognize, and in revenues provide for, current market rates for money so demanded for public use. • • •
>
> The responsibility having been placed on the commission by mandate, the commission may not sit idly by if unwarranted demands are made either in the matter of extensions and improvements or rates for money. • • •

The commission states that it has accepted for its guidance for emergency purposes, "the broad latitude or value between $14,000,000 and $16,000,000." In submitting, in 1920, a service-at-cost proposal, the city of Indianapolis offered to agree, for such purposes, to a value of $15,000,000. On a 7 per cent basis, $15,000,000 valuation would have called for fixed charges of $1,050,000, as compared with $989,380. In its proposal for service at cost the city included as a part of the cost of service a return on the value of the property put to public use. The commission, therefore considers itself "amply assured that no unfair burden is placed on the public served if recognized as valid and justified the listed $989,360 of fixed charges for 1921."

After reviewing the results obtained by the railway under the basic nickel fare, the commission continues:

> Having accomplished these remarkable results, it is not wisdom for the utility, city, or the commission to depart from such policies. It may be that a 2-cent transfer, or even a higher basic fare will be proven to be necessary, but the commission is of the opinion that, especially under this interlocutory order, the possibilities of the 1-cent transfer should be ascertained in a brief experimental period extending through January and February. It is possible that new conditions affecting both operating costs and revenues may be more clearly discerned and understood early in the year 1921.

The commission, in the order issued on Dec. 18, does not pass on the supplementary petition which raised the question as to whether the interurban companies are paying enough to the local company for power, track rental and terminal facilities. It found this question too complicated and the evidence too incomplete to pass upon at this time. It is intimated that a technical investigation may be ordered by the commission. The commission found that the local freight terminal facilities were inadequate, and has ordered the Indianapolis Street Railway to submit on or before Feb. 1, next, plans for improvements to be carried out by itself or the interurban companies.

Another Vote on Duluth Fare

By a vote of three to two the Council of Duluth, Minn., on Dec. 24 adopted a resolution authorizing a special election to be held on Feb. 3, when the citizens will again vote on an ordinance to grant the Duluth Street Railway a 6-cent fare. The proposed ordinance provides that it will be inoperative after two years from its adoption by the people, and may be terminated after one year. In brief, it provides for a 6-cent fare, for continuation of the present wage schedule of the railway's employees, for an improved service schedule and for the company to make such street improvements, as are in the opinion of the City Council found necessary.

The City Council also adopted a resolution placing the entire burden of the election and its incidental expenses upon the company and requiring the latter to deposit a check for $4,000 with the City Treasurer before Dec. 30 as a guarantee. The expenses of the election were estimated at $3,500.

The Council recently decided to force the railway to improve its service under sections nine and eleven of its franchise, which provide the city with power to regulate operation and management of the lines and to prescribe the number of cars which shall operate over any line. City Attorney John E. Samuelson had previously advised the Council that the company's complaint that it could give no better service on a 5-cent fare was not a valid excuse and that the company should fulfill its contract.

Railway Should Operate Buses, Says Connecticut Official

Operation by the Connecticut Company, of buses to supplement its trolley service was advocated by Lieutenant-Governor Clifford B. Wilson of Connecticut in an address at a recent meeting of the Get-Together Club of Hartford. The Lieutenant Governor, who is also Mayor of Bridgeport, declared that in time motor buses might replace the present electric railway system, but that, since the transportation business is monopolistic by nature, development of the bus idea should be undertaken by the railway.

It was pointed out at the meeting that the incoming Legislature would be called upon to abolish the state tax on gross receipts, paving taxes and the bridge taxes. Harrison B. Freeman, receiver of the Hartford & Springfield Street Railway, stated that a 10-cent fare was "about the limit" and that it was inadvisable to raise the rate above that point.

Public Utilities Commissioner Joseph W. Alsop told the gathering that the Connecticut Company's system cannot be split up as long as the company is in control of trustees appointed by a Federal court. In pointing out the status of the company, Commissioner Alsop said that the company did an entirely intra-state business but was virtually not under the control of the state because of its management by the trustees.

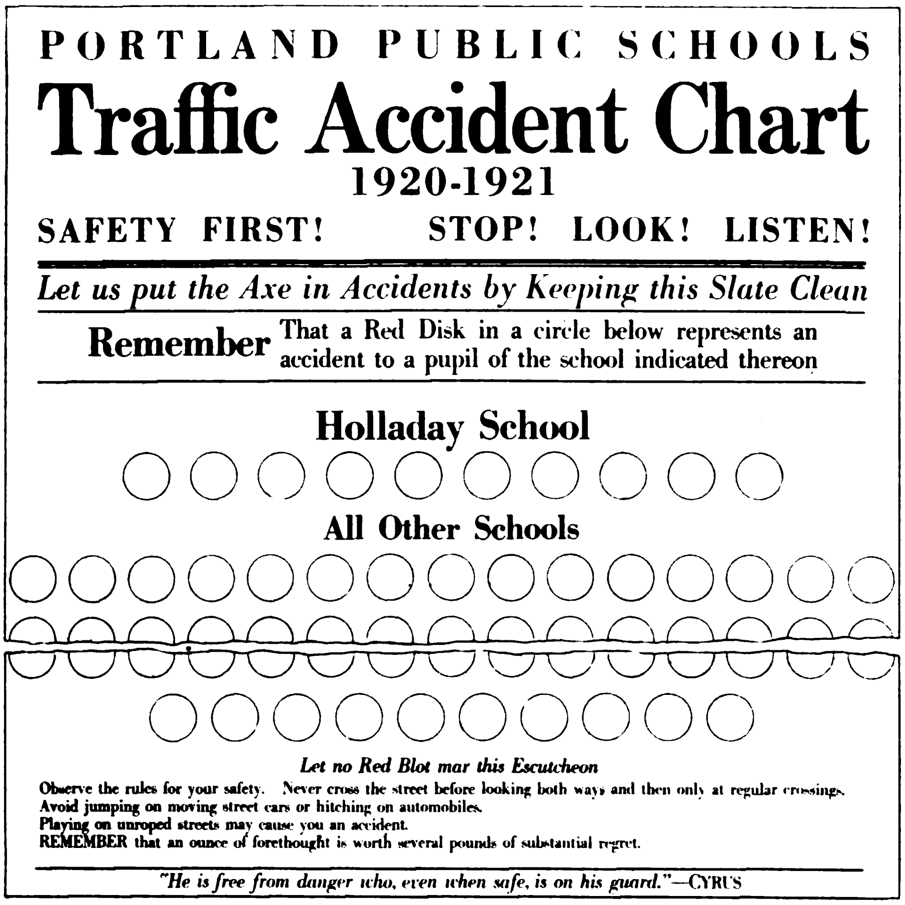
Lieutenant Governor Wilson summed up his remedies for the state's transportation situation as follows:

1. Retain the corporate entity of the trolley company.
2. Keep your transportation system monopolistic, but with proper regulation and control.
3. Permit the trolley company to operate motor buses.
4. Let the period of transition from the trolley to the motor bus be gradual as it is inevitable.
5. Let the experience of each community work out the destiny of its transportation system.
6. Do not operate as an entity for the whole state.
7. Let suburban lines be actually what they were intended to be, namely, competitors of steam roads, placing them on a mileage basis if necessary.
8. Readjust the system of state taxation and permit the towns to assess along with other property an equal proportion of the burdens of the town in which the physical properties of the company are located.

Safety Preached in Schools

The public school safety campaign is again on in Portland, Ore., under the direction of the National Safety Council. Co-operating in this work is the Portland Railway, Light & Power Company, which has heartily approved of the methods and plans of Portland's public schools in the campaign for the conservation of human life.

Much has been said regarding the efficient manner in which the pupils have been instructed in "safety first" during the past ten years in that city, but a departure was instituted this year by putting into each school a traffic-accident chart illustrated in the accompanying engraving. This chart is presented to the school by the "prominent" citizen giving the lecture on safety with the admonition to the pupils to "keep the slate clean."



PORTLAND PUBLIC SCHOOLS

Traffic Accident Chart

1920-1921

SAFETY FIRST! STOP! LOOK! LISTEN!

Let us put the Axe in Accidents by Keeping this Slate Clean

Remember That a Red Disk in a circle below represents an accident to a pupil of the school indicated thereon

Holladay School

All Other Schools

Let no Red Blot mar this Escutcheon

Observe the rules for your safety. Never cross the street before looking both ways and then only at regular crossings.
Avoid jumping on moving street cars or hitching on automobiles.
Playing on unroped streets may cause you an accident.
REMEMBER that an ounce of forethought is worth several pounds of substantial regret.

"He is free from danger who, even when safe, is on his guard."—CYRUS

TRAFFIC-ACCIDENT CHART FOR USE IN PUBLIC SCHOOLS

The chart is provided with circles in which red discs will be placed whenever there is an accident to a school child. These red discs are the size of the circles and will be printed with the name of the school to which the unfortunate pupil belonged and the date of the accident. The discs will be sent out from the office of the superintendent of schools with instructions to paste them on the chart. The school whose name appears on the disc will attach it in the circles reserved for that school, otherwise it would be pasted below. Information of a safety nature appears in the chart.

Much interest is manifested by principals and pupils to "keep the slate clean" and the psychological effect upon the child, as he examines the chart daily, is a constant reminder to him.

This chart was produced under the direction of Harry P. Coffin, manager of the public safety section of the National Safety Council, Oregon Division.

Seven Cents in Birmingham

Acting on the petition of Lee C. Bradley, receiver of the Birmingham Railway, Light & Power Company, Birmingham, Ala., the State Public Service Commission on Dec. 22 authorized an increase in fare to 7 cents on the Birmingham lines beginning Jan. 1.

The increase in fares was vigorously resisted by the City Commission. J. Ellis Brown, Commissioner of Public Utilities of the city of Birmingham, stated, following the announcement of the decision, that the city will ask for a reduction of fare to 6 cents.

Under the terms of the commission's order the 7-cent fare was granted for a period of one year. The petition of the receiver asked for the increase as an emergency measure. He showed at a hearing before the Public Service Commission on Dec. 21, that the company had been largely increased under the receivership.

The city of Birmingham maintained that the company was not entitled to the increase as a matter of "right." It showed that the receiver had "inherited" a number of debts when he took over the property, and maintained that while he had largely increased the indebtedness, the money expended had been used for capital investments. The city maintained that the 6-cent fare, which has been in effect for about a year, would give a proper return on the investment and claimed that the debts for what the city claimed were capital investments, should be paid by the owners of the property.

Immediately following the announcement of the decision granting the company the right to charge a 7-cent fare, J. S. Pevear, general manager of the company, stated that everything was in readiness to put the increased rate in effect. The only formality necessary was an order of Judge W. I. Grubb.

Estimates by city officials place the aded revenue, which will result from the increase, at $300,000 per year.

Interurban Decision Deferred

In awarding the 1-cent transfer charge to the Indianapolis Street Railway, the Public Service Commission of Indiana has authorized the Union Traction Company of Indiana to increase the fare between Indianapolis and Broadripple from 5 to 10 cents. Fares for rides between the down-town district and Forty-sixth Street, which is over the tracks owned by the Indianapolis Street Railway, will remain at 5 cents, and from Forty-sixth Street to Broadripple (over tracks owned by the Union Traction Company) the fare will also remain at 5 cents. Tickets will be sold at six for 50 cents. This order is effective Jan. 1. Petitions of the interurban companies for increased fares within the city were continued by the commission to provide time for readjustment of contract relations with the city.

The commission finds that the practice of the interurban companies in charging a city fare of 5 cents while at the same time interurban passengers are charged a fare of 3 cents a mile in the case of regular passengers and 1.78 cents a mile in the case of commuters, is discriminatory in favor of the city passenger. The commission also holds that the evidence does not disclose any essential difference in transportation over mileage within and without the city which could be expected to be reflected in the rate, and that therefore the discrimination cannot be removed by reducing the interurban fare within the city.

The commission states that the 5-cent fare has been charged because of a franchise agreement with the city of Indianapolis which is still in force. Because of the fact that the interurban companies have not surrendered their franchises as provided by law the commission holds that its jurisdiction is debatable. Therefore the commission believes that these interurban companies should go to the city officials and endeavor to have the provisions of their franchise changed so as to permit of the charging of a higher fare.

Transportation News Notes

Parents Asked to Warn Children.—The Duluth (Minn.) Street Railway is conducting an advertising campaign in the local newspapers to educate the public against coasting accidents. The ads call attention to the fact that coasting accidents have already occurred and that narrow escapes are reported daily. Parents are asked to warn their children against coasting across car tracks.

Wants More in Ithaca.—The Ithaca (N. Y.) Traction Company has applied to the Public Service Commission, Second District, for authority to charge a fare of 10 cents in all municipalities in which it operates, effective on short notice. The company submits statements and alleges that the present 7-cent fare is insufficient to yield reasonable compensation for the service rendered.

Must Charge 5 Cents.—Judge J. B. Hutcheson has denied a motion of counsel for the Georgia Railway & Power Company, Atlanta, Ga., for a writ of supersedeas to allow the company to raise its fare from 5 cents to 7 cents on its line in Decatur. Some time ago Judge Hutcheson enjoined the company from charging a 7-cent fare and giving passengers 2-cent rebate receipts, as is being done in College Park under the terms of a supersedeas issued by Judge Pendleton.

Central Association Reissues Tariffs.—The Central Electric Traffic Association is reissuing theatrical baggage tariffs with additional rules and change of rates. Joint passenger tariffs in Indiana are also being reissued to conform to change in rates, later to be followed by reissuance of passenger tariffs in Ohio; and after the reissuance of these tariffs, the interstate passenger tariffs will be reissued to conform to recent rate raises which have been general all over the country. It is planned to reissue the Central Electric Railway equipment register early in 1921. Joint local storage tariffs will shortly be reissued also.

Ten Cents in Vancouver.—The Washington Public Service Commission has authorized the North Coast Power Company, Vancouver, to put into effect a 10-cent fare on its Vancouver city lines with commutation books of eleven tickets for $1. The fare has been 7 cents. In promulgating the order the commission took occasion to review the general situation with respect to street railway companies, pointing out that companies everywhere are in a bad way financially, "due principally to the competition of automobiles, both private and for hire, and the only method by which the companies can secure a sufficient return to justify their continued existence is through increased fares."

Delays Final Action on Parking.—The new traffic ordinance for Chicago, Ill., in which it was proposed wholly to prohibit all parking of vehicles on any of the streets in the "Loop" district between the hours of 7 a.m. and 6:30 p.m., has been tabled. The bill was recently passed by the City Council. Later Mayor Thompson referred it back to the Council and asked for its reconsideration. The Council referred it back to the committee on local transportation, where it originated. This is considered to have virtually killed the bill. Pending final settlement of the parking problem the present ordinance which limits parking to a 30-minute period will be enforced by the chief of police. At the end of the month he will report to the committee on the advisability of re-passing the proposed no-parking ordinance.

Service Restored Pending Fare Decision.—Normal street car service has been re-established in the cities of Syracuse and Utica by the New York State Railways. Mayor Harry H. Farmer of Syracuse and Mayor James K. O'Connor of Utica made application to the Public Service Commission, Second District, for a restoration of service, which was granted in each case. The company resumed old schedules and took back all of the men recently relieved from duty, pending action by the commission on the application for a 10-cent fare in both Syracuse and Utica. The company is charging 6 cents in both cities. It claims this rate to be inadequate. The service was curtailed because of the refusal of the municipalities to allow the railway to increase the rate. The Common Council of Syracuse recently rejected a plan for the drafting of a service-at-cost ordinance for the Syracuse lines.

Eight Cents in Auburn.—The Public Service Commission, Second District, has authorized the Auburn & Syracuse Electric Railroad, Auburn, N. Y., to charge until Dec. 31, 1921, an 8-cent fare in Auburn, a 10-cent fare between Auburn and the Soule Cemetery, and between Auburn and the South Street on its Owasco Lake line, with transfer privileges; and outside of the city limits on the Soule Cemetery, South Street or Owasco Lake lines, 5 cents. The increase asked for was based chiefly on increased wages. Employees demanded an increase last spring. A four days' strike followed. An arbitration award gave a 15-cent an hour increase to conductors and motormen, and increases ranging from 18 to 23 per cent to other employees, thereby adding about $90,000 to the operating expenses of the company and $60,000 to the operating expenses of the city system. The Auburn city authorities waived a franchise restriction until Dec. 21, 1921.

Passing Stalled Car Legal.—The ordinance of the city of Raleigh, N. C., regulating traffic passing stationary street cars does not affect a car standing still in the middle of the block or at places other than those designated for the receiving or discharging of passengers, according to a recent ruling of Municipal Judge Harris. Judge Harris held that an automobile or any other vehicle may pass a stationary car in the middle of a block without an infraction of the law. The ruling came in the midst of the trial of a motorist charged with reckless and careless driving in colliding with a motorman. The evidence showed that the street car was stationary in the middle of a block just behind a work car. The defendant drove his machine to a point opposite the electric car and struck the motorman shortly before his automobile stopped. The defendant contended that the motorman stepped in the way and that the accident was due to the motorman's carelessness.

Seven-Cent Fare Approved.—Judge J. C. Hutcheson of the United States District Court for the Southern District of Texas has approved the report and findings of the master in chancery in the case of the Galveston (Texas) Electric Company versus the city of Galveston, in which the traction company sought authority to increase its fare from 5 cents to 7 cents. The company contended the 5-cent rate was confiscatory. Judge Henry J. Dannenbaum was appointed special master and held hearings and conducted thorough investigations in Galveston to determine the property valuation, rate of return, fair depreciation, maintenance costs and other factors to be considered in fixing a fair rate of return. The master in his report recommended the granting of a 7-cent fare for the Galveston lines. The court has enjoined the city authorities from interfering with the collection of the higher rate. The company will shortly begin negotiations with the city looking to the drawing up of a new franchise.

Dairymen Want System Improved.—Every electric and steam railroad in the state of Ohio is a defendant in the complaint brought by the Ohio Dairy Products Association before the Public Utilities Commission on Dec. 16. The association asks that the roads be compelled to adopt a uniform receipt or waybill system in the transportation of milk cans. The particular item of complaint has to do with the "ticket system" in use by the roads for identifying the cans. It is declared that the stubs of the tickets on the empty cans to be returned are frequently lost or washed off, resulting in loss of the can. In many other instances it is complained, all tickets on a shipment are tied to a single can, causing confusion, so that no record can be kept or had of any shipment. In consequence no proof of claim can be made showing either delivery to the carrier by the shipper or failure to receive shipment by the consignee. It is asked that the carriers issue a uniform receipt or waybill which will enable identification of cans and sureness of shipment and distribution.

Personal Mention

Resumes Law Practice

O. B. Willcox Will Have Office in New York—Resigns from Bonbright & Company

O. B. Willcox retires as vice-president of Bonbright & Company, Inc., New York, N. Y., on Jan. 1 to resume the general practice of law, in which he was previously engaged. He will have offices in connection with Messrs. Choate, Larocque & Mitchell, at 40 Wall Street, New York. It is understood, however, that Mr. Willcox will still represent Bonbright & Company in many matters.

Mr. Willcox has been closely identified with the electric railway industry in many ways during the past few years, not only through his connection as director of a number of utility, industrial and financial companies, but also as a member and a vice-chairman of the Committee of One Hundred of the American Electric Railway Association since the organization of that committee in June, 1919.

He is also a member of the board of governors of the Investment Bankers Association of America and for several years past has been the chairman of its committee on public service securities. In these capacities and through his reports, addresses and articles in the financial and technical papers on public utility topics, he has done a great deal to develop a proper understanding of the function of the regulation of utilities and in bringing about co-operation between investment bankers, public utilities and regulating officials.

Mr. Willcox is a graduate of the law department of the University of Michigan and practiced law in Detroit and later in Colorado with notable success. He came to New York about ten years ago, and since that time has been an active executive of Bonbright & Company, Inc.

Promotion for Mr. Krombach

Harry J. Krombach, who has been foreman of the electrical repair department of the Third Avenue Railway, New York City, for the past twelve years, has been advanced to the position of general foreman of shops for that company.

Mr. Krombach began his railroad experience in 1896 with the Nassau Electric Railroad, a subsidiary of the Brooklyn Rapid Transit Company, and worked in the shops of that company until 1900. He then entered the employ of the Boston Elevated Railway at the time it was equipping its first cars for electric train operation. In 1902 Mr. Krombach began service with the Manhattan Elevated Railroad, New York. Two years later he joined the Jersey Central Traction Company, Keyport, N. J. After serving with that road in various capacities for four years, he became connected with the Third Avenue Railway. For several years he has been in charge of all electrical repair work.

"Johnny" Livers Again

This Time Mr. Livers Becomes President of the Charlottesville & Albemarle Railway

John L. Livers, who has been vice-president and general manager of the Charlottesville & Albemarle Railway, Charlottesville, Va., since 1912, has been elected president of the company to succeed Norman James, who has resigned to become chairman of the board of directors. Henry L. Duer has been made vice-president of the company. Custis L. Carter, general superintendent, has been promoted to general manager, while Kirby Snider, manager of the new business department, has been made general superintendent.

"JOHNNY" LIVERS

Patrons of the Charlottesville line as well as the stockholders of the company agree that Mr. Livers' promotion has been well earned. Charlottesville, from the portliest "Colonel" to the tiniest picaninny, welcomes the opportunity to congratulate him. For the past eight years it has been congratulating itself on Mr. Livers' presence in its midst.

"Johnny" Livers has put Charlottesville, a city of 7,000 souls, on the map by giving it a real railway. Just how "real" this railway is from the viewpoint of the car riders may be judged from the fact that it operates the year 'round at a five-minute headway and a nickel fare. As for the stockholders, their opinion of their "G. M." is not hard to guess when one is told that during the past year the railway has paid dividends of 7 per cent on its preferred and of 3 per cent on its common stock, besides setting aside a considerable amount for depreciation reserve and surplus.

"Johnny" Livers was born in Gettysburg, Pa., in 1878. Starting as a lineman at the age of eighteen he worked for several years in various phases of construction work. He then entered the operating and contracting field, and during a period of twelve years constructed more than 100 electric light and power plants. In 1912 he took charge of the Charlottesville property. An account of Mr. Livers' operating methods was published in the issue of Sept. 22, 1917, page 485.

Changes in Interurban Personnel

Harry E. Pence, president of the Pence Automobile Company, has been elected president of the Minneapolis, Northfield & Southern Railway, Minneapolis, Minn. Former President J. H. Ellison is chairman of the board. W. R. Stephens, formerly of the "Omaha" road and of late sales manager for the Pence Company, is assistant to the president. Mr. Pence is president of the Minneapolis Automobile Trade Association, is a director in the Lincoln National Bank, is member of a company erecting office buildings, and is a progressive citizen generally.

New equipment has been bought for the Minneapolis, Northfield & Southern Railway and eventually the line will be electrified. It is now gaso-electric and has steam engines for switch work.

H. R. Skirving in New York

H. R. Skirving has been appointed auditor of the Eighth Avenue Railroad, New York City. Mr. Skirving served as auditor of the London & Lake Erie Railway, London, Ont., from 1906 to 1912. He then joined the Otsego & Herkimer Railroad, Cooperstown, N. Y., as auditor. The Otsego & Herkimer Railroad changed its name in 1916 to the Southern New York Power & Railway Corporation, and in the following year acquired the Southern New York Power Company, a merger of several small lighting properties in that section of the State. Mr. Skirving served as treasurer of both companies until Dec. 15 last.

G. T. Seely, President

Garrett T. Seely, vice-president and general manager of the Pennsylvania-Ohio Electric Company, has been elected president of The Youngstown Municipal Railway, a subsidiary of the Pennsylvania-Ohio Electric Company, which operates the city railway lines of Youngstown, Ohio, under a service-at-cost arrangement. Mr. Seely succeeds as president of the Youngstown company R. P. Stevens, who resigned as president to be able to devote more time to his duties as president of the Pennsylvania-Ohio Electric Company and associate companies. Mr. Stevens remains a director of the Youngstown Municipal Railway.

Promotions on Public Service Railway

H. H. George Appointed Engineer Maintenance of Way—H. W. Codding Made Distribution Engineer—Others Step Up

A number of promotions of interest have recently taken place in the engineering department of the Public Service Railway of New Jersey. Under the new plan Howard H. George, assistant engineer, becomes engineer maintenance of way. Martin White continues as superintendent maintenance of way. H. W. Codding, engineer of the distribution department, is advanced to distribution engineer. George H. Haldeman is promoted to assistant engineer maintenance of way, while Nelson A. Baldwin is made special work engineer. Morris J. Baller becomes estimating enginer, while Leslie B. Woodruff is appointed construction engineer. B. W. Pierson, formerly secretary to Richard E. Danforth, vice-president and general manager, is made executive assistant to Mr. Danforth. Alfred H. Nelson is promoted to chief clerk in the engineering department.

HOWARD H. GEORGE, appointed engineer maintenance of way, is a graduate in civil engineering of the University of Pennsylvania, class of 1907. He began his practical experience early in the summer of 1906 as resident engineer in charge of the construction of a suburban railway extension for the Public Service Corporation, and remained in charge of that work during his last year at college. Upon the completion of the project in 1907, he was transferred to headquarters at Newark, where he served as a field engineer until 1909. At that time he was appointed division engineer of the Southern Division of the company's property, taking in all the lines radiating from Camden. In 1911 he was promoted to the position of assistant engineer and again transferred to Newark. He served in this capacity until May, 1917, during which time he was in charge of estimating and engineering cost accounting work, and also had supervision over bridge design and erection.

As an officer of the Engineer Officers' Reserve Corps, Mr. George, then a first lieutenant, was called to active duty on May 8, 1917. After three months in training camps at Fort Meyer and elsewhere he was promoted to the rank of captain and assigned to the 305th Engineers, 80th Division. He served with this unit in command of Company E until April, 1918, when he was transferred to the 55th Engineers, a broad gage railroad construction regiment. In the latter unit he commanded Company A, serving with that outfit in France until the end of November, 1918. During part of this time he was in charge of building construction on the Chateauroux Storage Depot project. Shortly after the signing of the Armistice he was transferred to Le Havre on special duty with the Base Section Engineers and made engineer in charge of railroad construction. The signing of the Armistice having halted all construction work in the A. E. F., Captain George was among the first officers returned to the States. He landed in Hoboken the latter part of January, 1919, at which time, at his own request, he was honorably discharged from the military service.

He returned to his former poistion as assistant engineer with the Public Service Railway in February, 1919, continuing in that capacity until his recent appointed as engineer maintenance of way. He is a member of the American Society of Civil Engineer, and is also a new member of the Committee on Way Matters of the American Electric Railway Engineering Association. Mr. George is known to many members of the industry through his frequent contributions to the ELECTRIC RAILWAY JOURNAL

H. H. GEORGE

H. W. Codding is a graduate of the electrical engineering department of the Massachusetts Institute of Technology, class of 1912. He entered the employ of the Public Service Railway in July, 1912, as a cadet engineer. He served in the mechanical, transportation, track and distribution departments of the railway and in the production department of the Public Service Electric Company, and was finally promoted to engineer in the distribution department of the railway, where he served until December, 1917. From December, 1917, to January, 1919, he was employed as assistant to the chief electrical engineer of the New York Edison Company, returning to Public Service Railway on the latter date as engineer in the distribution department. By his recent promotion Mr. Codding becomes distribution engineer.

George H. Haldeman, appointed assistant engineer maintenance of way, is a graduate of the Newark Technical School, class of 1904. He has been employed in various capacities in the engineering department of the railway since 1903. He has held the position of office engineer from 1908 until the time of his appointment to his present position. Prior to his connection with the Public Service Railway he was employed on municipal and city survey work by a firm of surveyors in the city of Newark, and also worked on special track layout with the New York Switch & Crossing Company, with headquarters in the city of Hoboken, N. J.

Nelson A. Baldwin, promoted to special work engineer, was graduated from Barringer High School, Newark, N. J., in 1909. Before joining Public Service Railway he was employed with a Newark firm of surveyors, and at the same time attended classes in the Newark Technical School. Later he completed a course in surveying at Columbia University. His connection with the Public Service Railway dates from September, 1912. During the past eight years he has served as draftsman and as engineer on design of special work.

Morris J. Baller, who is made estimating engineer, is a graduate of the civil engineering department of New York University, class of 1909. Following his graduation he was employed by Terry & Tench on miscellaneous design work. In 1910 he entered the service of Juragua Iron & Steel Company, a subsidiary of the Bethlehem Steel Company, at Juragua, Cuba, where he was employed as assistant engineer on preliminary surveys for a proposed railroad. He joined the Public Service Railway in November, 1910, and has served successively as draftsman, instrument-man and engineer with the Public Service.

In the past two or three years Mr. Baller has been in charge of the preparation of detailed cost report analyses and in the compilation of detailed estimates of track construction and reconstruction work of all kinds. During a portion of the time covered by the war period he served with the United States Bureau of Standards at Washington, where he was assigned to draw up for the Government reports on various phases of electric railway transportation.

Leslie B. Woodruff, promoted to construction engineer, was a student in mechanical engineering at the University of Wisconsin, class of 1903. During the summer months from 1896-1903, he served as foreman of construction with the United States Light House Service on the Great Lakes. He entered the employ of the Public Service Corporation in December, 1903, as a student, spending most of his time in the shops. Two years later he became associated with the engineering department as an inspector on building construction. In April, 1910, he was appointed division engineer, which position he held up to the time of his appointment as construction engineer. He is an associate member of the American Society of Civil Engineers.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Year's Buying Has Not Been Heavy

Traction Interests Have Been Purchasing Only for Immediate Necessities in Most Cases, but Outlook for 1921 Is Much Better—Stocks Generally Plentiful

The year just passed has been a hard one for the traction purchasing agent. On his side of it he has been hampered by a shortage of funds which has required that he purchase only at the last minute, in the long run of cases, and then only for his immediate needs.

On the other side the manufacturer of traction supplies has been hampered by production conditions that have virtually been unprecedented in extent. High prices, low supplies of coal and raw materials, freight handlers' strikes, freight tie-ups and congestion, car shortage, labor shortage and inefficiency—all these coupled with a phenomenal demand on the part of the electrical industry as a whole over the first half of the year made it very difficult to supply traction companies on short notice with many items of their needs. At the same time there were of course many items of electric railway maintenance on which quick deliveries could be secured because buying was not very heavy and was in small amounts, and also because certain small stocks were available.

With heavy price reductions in textile, leather and some few other lines there has been anticipation from some quarters of a price reduction in supplies for traction companies. In general these reductions have appeared only in instances where articles are made for the most part from cotton, iron and copper and show relatively little labor cost.

Few extensions have been made in the past year, but during that time many companies have been granted fare increases which should permit them to make these much-needed extensions in the near future. The traction interests are behind in their new work and frequently so in their maintenance and repairs, so it would seem that the coming year should see a great deal of buying.

Short Supply of Track Material Greater Part of Year

During the first three-quarters of the year deliveries on track supplies such as spikes, bolts and nuts steadily lengthened under a steady pressure of demand. Foreign competitive buying aided in piling up a large volume of unfilled orders, especially on bolts. By the first of September, when the scarcity had about reached its height, deliveries of standard railroad spikes averaged two to three months and track bolts three to four months. From then on the situation eased up under slackening demand and canceled orders, until by the end of the year shipments were being made almost from stock in some cases and as long as six weeks on bolts and four weeks on spikes in others. Prices followed an upward trend as a result of high fuel, labor and material costs, but have gradually declined in the last quarter. Prospects for consumption of track material in large quantities by railroads next spring are held to be excellent.

Normal Orders for Brake Shoes

Orders for brake shoes from electric railways were held close to actual requirements and the expected increase in buying from steam railroads following their rate increases did not materialize in the volume that was anticipated. Nevertheless, buying on the whole during the year was about normal. Raw material stocks were reduced to lower levels than usual as shipments of coal, coke and pig iron were slow and irregular for a considerable period. Customers' needs were well taken care of, however, as deliveries of standard shoes for the most part were made from stock. The standardization movement, reducing the number of patterns carried virtually to four styles, aided in this. Orders on behalf of new rolling stock were a negligible factor in the demand.

Demand for Wood Ties Not Up to Standard

Consumption of railroad ties does not seem to have been up to the standard of other years as buying for the most part has been for replacements only. Steam railroads did not enter the market as heavily as was expected the last four months of the year. Stocks of ties at the camps were maintained at good levels, but car shortages for long periods curtailed the supply and made shipments uncertain. An influx of Douglas fir ties is noted in the East and Middle West to supplant oak ties cut along the right of way, as the latter were rather high in cost and uncertain in supply. One factor which served to curtail the supply of ties was the higher prices which timber owners obtained for trees cut into board lumber, while another was a shortage of labor at certain times due to higher wages paid workmen for cutting this same board lumber. Prospects for good demand in 1921 are thought to be excellent as the normal consumption of ties necessary to keep roadbeds in good repair, according to the United States Forest Service, is 100,000,000 to 125,000,000 annually. For the past several years buying has fallen considerably below this figure owing to financial conditions.

Demand for Railway Motors Slackens in Last Half

Sales of railway motors were very gratifying during the first half of 1920, the bulk of the demand, of course, being for motors of the safety-car type in about the proportion of three to one. During the last six months, however, quietness has been the prevailing feature of the market. Inability to obtain control equipment and a shortage of gears, insulating material and various small parts were the chief factors impeding deliveries, which ranged around three to four months for moderate orders of safety-car motors and six to eight months for large types early in the year. These figures gradually improved under the slackening market to about forty-five to sixty days for the safety-car motors and a month longer for heavier types. Raw material, while much easier as to supply, has remained high in price and consequently prices have not changed since a slight increase by manufacturers of safety-car equipment last February.

Waste Supply Curtailed by Textile Mill Shutdowns

Good demand and the curtailed production of textile mills were responsible for short supplies of cotton and wool waste over a large part of the year. Many New England mills cut production to four and even three days per week and some even closed down entirely. This naturally reduced the supply of waste, which is a by-product of textile mills, so that stocks were very low over a long period.

The price trend of waste was still upward the middle of the year, when advances of 2 cents per pound on cotton and 1 cent on wool waste brought the price to 9 to 16 cents for cotton colored, 12½ to 18 cents for cotton white and 16 to 25 cents for wool waste. Prospects of a shortage were removed, however, when demand dropped to almost nothing the latter part of the year. At the same time price decreases were made in view of the lower raw material cost, spot cotton being quoted at 14½ cents now in New York. Quotations recently were 7½ to 12 cents per pound for cotton waste colored and 10½ to 14 cents for white in 100-lb. bales.

Slump in Strong Demand for Trolley and Bell Cord

Demand for trolley and bell cord in 1920 compares very favorably with other years as until comparatively recently the supply of this material was not as large as the demand. A distinct tendency has been noted to replace leather material with braided cotton bell cord. Demand for sash cord from the building trade the early part of the year was partly responsible for prevailing low stocks until the first of November. Deliveries during this period ranged in the neighborhood of one to two months.

The supply of cotton at no time occasioned any great trouble except as shipments were delayed by freight tieups. Prices advanced somewhat in the spring, at which time quotations ranged from $.97 to $1.10 per pound according to grade and manufacturer. Following the lower cost of raw cotton, however, quoted now at 14.50 cents New York, trolley and bell cord prices have fallen to a range of 66 to 85 cents per pound. Demand at present is light in character and the supply plentiful for all needs.

Malleable Castings Now Available

The supply of malleable castings has been one of the plague spots in the production of electric railway supplies through a great part of the past year. Foundries which some of the time were forced to operate at as low a capacity as 50 per cent, due to labor shortage, were utterly unable to supply the demand and had to refuse many orders. Prevailing long deliveries in many items in the supply branch of the electric railway industry can be traced largely to this circumstance. Manufacturers were very often forced to use substitutes perhaps higher in price or less efficient. The shortage of coal was another factor in bringing about the extreme long delivery of eight months on heavy castings and ten weeks on light malleable castings. The latter half of the year, as labor became more plentiful and transportation eased up and permitted supplies of coal and raw material to come through, the situation grew better. Deliveries have been steadily improving, but are still far from all that is desired. Prices have remained steady.

Good Volume of Business for Fare Boxes and Registers

The growing use of metal tokens and an increasing tendency to count fares instead of passengers on street car lines resulted in excellent sales of fare boxes, demand being well ahead of 1919 in this respect. Buying of fare registers was also good, but does not present such a uniform increase over a year ago, for some manufacturers report the biggest year of any in sales, while others have met only an average normal demand. Raw material difficulties were experienced by producers, especially in obtaining steel and malleable castings. Fare registers were in better shape as to shipment, as a level of three months' stock was maintained on standard types, though delivery of some ranged as long as four months. Fare boxes, however, could not be shipped from stock, as by midsummer back orders for a period of three months had piled up. Prices have been fairly stable, with some slight increases being made about the middle of the year by some companies that had not taken this step to meet rising material costs in 1919.

Pole and Hardware Sales Good

For the first nine months of the year railways at a distance from lumber regions had trouble getting wood poles and crossarms. Pins were a little easier. Demand was dropping off by midsummer, but even then shipments were by no means certain. They had been virtually impossible from the mills, where stocks were in good shape. But jobbers' stocks were low because of car shortage. In the woods labor was short in the winter and spring, and weather conditions and transportation were such as to hamper seriously the delivery of poles. Production during the present winter is expected to be better than that of last year.

Car movement improved in the late summer and fall and poles and arms are moving in good shape now from pretty good stocks. Buying has been good for maintenance purposes, and this condition should continue because of the general policy of keeping purchases down to present needs.

For steel towers the foreign demand has kept up, while domestic has been light. Shipments run from about four to seven months.

Line hardware buying opened up well in the spring and continued at a good rate right through the year, mostly, however, for near-by demands only. While stocks started in good condition, they soon petered out when strikes in the steel mills and car shortage cut down production in May and June. These stocks were still short when winter set in.

High-Tension Porcelain Hard to Get

Shipments of high-tension insulators, bushings, etc., are still ruling long, from three to eight months being quoted, depending on type and voltage. This has been probably the hardest bit of supply material for electric railways to lay hands on for the whole year. Demand for domestic uses has in general been good all year and when it has dropped off the foreign demand has held up well. All this has had its effect upon the production of high-tension porcelain for traction use. There has not been so much buying for new extensions but rather for maintenance work.

Early in the year production was off as much as 40 per cent in some instances because of the inability to get labor for the kilns, its inefficiency and its independence. Unsatisfactory production resulted and prices went up. Also malleables were short. These conditions have since been rectified to an extent, but shipments have not shortened very much.

Steam Coal Prices Decline

Supply Greater Than Demand with Many Industries Shut Down—Speculation Is Past

"The coal market is saturated," declared an official of one of the large Middle Western coal sales companies last week. The poorer grades of steam coal have dropped from $2 to 83 cents a ton in the Central West, while the better grades that have sold at from $7 to $8 are now going begging at from $3.50 to $4. In some cases coal that sold at from $8 to $10 a few months ago is now going at $3 per ton.

"There is a greater supply than demand," said George W. Reed, vice-president of the Peabody Coal Company, in a public statement last week. "Industries have shut down all over the country. They have no further use for fuel. Conditions are beginning to readjust themselves. I would say that the drop in the price of coal is simply an indication of business getting down to normal competitive prices."

The indications in the entire Middle Western territory are that the wild speculation of the last few months is past and that the coal industry is settling down on a normal basis with no danger of shortage except in a few spots where transportation may be hindered if severe winter weather should develop suddenly.

100 More Cars for N. Y. Municipal Railway

The New York (N. Y.) Municipal Railway, through an order signed the first part of this week, is authorized by the Public Service Commission to purchase 100 additional steel subway cars for use on the Municipal Railway lines. The order will go to the Pressed Steel Car Company at a price said to be $36,410 each. The cars are a duplicate in construction to the previous order of 100 cars placed with the Pressed Steel Car Company last May. These were equipped with Westinghouse type A. M. U. E. air brakes, Westinghouse type A. B. F. control and General Electric type 248-A motors. Seating capacity is about ninety persons. It is expected that the new cars will be ready for delivery in 18 months. This latest order makes the ninth lot of 100 cars of this type that have been ordered by the company. About 600 of these had been delivered up to Oct. 1 last, on which date the first of the seventh lot of 100 cars were to be delivered.

Rolling Stock

The London (England) County Council has contracted for 125 new tramcars. There were separate bids by British manufacturers for the bodies, trucks, electrical equipment and magnetic brakes, which bring the total cost to approximately £4,300 per car, or at present exchange rates about $15,050. This is said to set a record price for cars of this type in England. In 1910 the cost of a similar car was £880. The cars will be of the eight-wheel bogie type, double decked, with roof seats enclosed, and a total seating capacity of about eighty people. Delivery is to begin in forty-two weeks from the date of order.

United Railways Company of St. Louis, Mo., through Colonel A. T. Perkins, manager under the receiver, will request permission from Judge Lamm to buy fifty more cars of the large 777 type in the near future. Fifty cars of this type are being made in the company's shop, three are in operation and sixteen more will be completed about Jan. 1. It is expected that all will be in operation by March 1.

Power Houses, Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—Construction on the new Pacific Electric depot at Wilmington is under way. The structure will cover a space 24 ft. x 60 ft. It will consist of two waiting rooms, ticket office and express room.

Union Traction Company, Nashville, Tenn.—The City Council of Gallatin is negotiating with the Union Traction Company, Nashville, for furnishing power to the city of Gallatin, Tenn., for lighting and motive power. The contracts will call for erecting a line from Nashville to Gallatin over the right-of-way of the Union Traction Company, operating an interurban railway between the two cities. A substation will be erected between the two cities. The present power plant of the city of Gallatin is inadequate to meet the growing demands for lighting, but will be retained for use in emergencies.

Track and Roadway

Interborough Rapid Transit Company, New York, N. Y.—Construction of the Queensboro subway will be started within the next few months and according to the transit commissioner the work will be rushed to completion. This extension will be an improvement over the shuttle system in operation between Grand Central and Times Square. Under the proposed new scheme passengers from Queens en route north and south on the west side will remain on the trains to Seventh Avenue and Times Square.

Seattle (Wash.) Municipal Railway.—D. W. Henderson, superintendent of the Seattle Municipal Railway, has recommended to Mayor Hugh M. Caldwell and the City Council the undertaking in 1921 of ten municipal railway extensions and betterments, estimated to cost between $543,713 and $583,853. The proposed improvements affect Ballard, the Green Lake and University districts, First Hill, Rainier Valley, Georgetown and the waterfront district toward Georgetown. Mr. Henderson states that all the improvements are absolutely necessary. He urges that the necessary steps be taken to issue bonds to secure money for the extensions. In addition, the sum of $20,000 will be required to purchase feed wire.

Toronto, Ont.—The recommendations of the Board of Control that the Transportation Commission be empowered to expend $500,000 on additional car lines in Ward 7 was referred back by the City Council.

Toronto, Ont.—Mayor Church proposed to the City Council that the Board of Control report on a by-law to provide street railway accommodation for West Toronto.

Hydro-Electric Power Commission, Ottawa, Ont.—Surveys are being made by the engineers of the Hydro-Electric Power Commission with a view to constructing an extension of the railway lines along Ottawa Street, Erie Street and Parent Avenue, Windsor. Application will be made to the Ontario Legislature at its next session for permission to issue $1,000,000 of bonds for this purpose.

Trade Notes

The Worthington Pump & Machinery Corporation, 115 Broadway, New York City, is receiving bids for the erection of a one-story, 50 ft. x 75 ft. addition to its plant at St. Bernard, Ohio.

The Absolute Con-tac-tor Company, Chicago, has moved its factory from 2003-2005 Larrabee Street to larger quarters at 4056-4058 Armitage Avenue. The offices of the company remain at 127 North Dearborn Street.

The Lincoln Revolving Transformer Company, Cleveland, Ohio, recently organized by J. C. Lincoln, president of the Lincoln Electric Company, to manufacture a revolving type of tranformer developed by Mr. Lincoln, has established a plant at 2400 Woodland Avenue.

British Export Register Out.—The export register of the Federation of British Industries has been published by that federation, 39 St. James Street, London, S. W. Among the 650 pages are given the federation's constitution, aims, etc., list of members with their manufactures classified, and advertisements.

The O. M. Edwards Company, Inc., Syracuse, N. Y., manufacturer of window fixtures, platform trap doors, etc., announces the appointment of C. A. Eggert, who for a number of years was connected with the sales department of the Consolidated Car Heating Company, as sales manager for the central district, with offices at 1425 Edison Building, Chicago, Ill.

The C. & G. Cooper Company, Mount Vernon, Ohio, engine builder, has made a number of changes in its organization during the year. At the regular meeting held in June the following officers were elected: B. B. Williams, president and general manager; F. H. Thomas, vice-president in charge of sales; Mr. Taylor, secretary in charge of production, and W. L. Daney, treasurer. The company reports an increasing volume of business.

The Chase-Shawmut Company, Newburyport, Mass., announces the appointment of H. C. Moran, Keystone Building, Pittsburgh, Pa., as district representative for the following territory: Western Pennsylvania, Ohio, Kentucky and West Virginia. The Engineering Equipment Company, 1011 Chestnut Street, Philadelphia, Pa., has also been appointed district representative for eastern Pennsylvania, New Jersey and Maryland.

Charles Lyman Rand, secretary and chief chemist of the Mitchell-Rand Manufacturing Company, New York, manufacturer of electrical insulation, has relinquished his duties as factory superintendent to devote his entire time to important research work in the chemical and allied fields for his company. He will be succeeded as factory superintendent by Joseph T. Lawrence, chemical engineer, formerly associated with E. I. du Pont de Nemours & Company.

New Advertising Literature

Oilers.—The Eagle Manufacturing Company, Wellsburg, W. Va., has issued catolog No. 20, covering its different types of oilers.

Electrical Instruments.—The Burton-Rogers Company, 755 Boylston Street, Boston, Mass., sales department for the Hoyt electrical instruments, has issued a catalog of Hoyt electrical instruments, including dashboard, miniature switchboard, large switchboard and portable instruments.

Small Turbo-Generator Sets.—The General Electric Company, Schenectady, N. Y., has published bulletin No. 42,-010A, which supersedes bulletin No. 42,010, describing and illustrating the small Curtis steam-turbine generating sets. These generating sets have a capacity of 100 kw. to 300 kw. and are mounted on a common base with turbine and gearing.

Power Plant Specialties.—The Plant Engineering & Equipment Company, 192 Broadway, New York City, has issued a twenty-page catalog covering its "Peeco" specialties, including steam traps, separators, strainers, regulating devices, blowers, meters, etc.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL. Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

Volume 57 New York, Saturday, January 8, 1921 *Number* 2

Fare Changes and Conductors' Morale

THE maintenance of good public relations is desirable for many reasons, but one to which attention has not often been directed is that of the effect of good public relations on the morale of the operating force. In those cities where the management and the company are generally considered to be doing the right thing and the railway system is regarded with pride by the community it is but natural that the operating force should reflect this condition by taking a pride in its work. Where the contrary is true, however, it is obvious that the operating force will respond also to this situation, particularly as the men on the cars are the recipients of the greater part of the complaints.

For this reason sources of irritation in the service which are not matters of principle should be avoided wherever possible.

One common cause for complaint with zone systems on an intercommunity line where the zones are on a distance basis is to have the fare limit occur at a point across which there is at times much over-riding in one direction or the other for a few hundred feet or so. Discontent is more apt to be enhanced in a case of this kind, of course, where there has been a recent change in fares. In such cases it will usually be found desirable for the company so to place its zone limits that they fall as far as possible between community limits rather than within them. If this is done it obviates discrimination of passengers that live close to the zone line, adds very much to the maintenance of good public relations with the inhabitants of that district and is likely to increase car revenues.

Suggestions as to what constitute such causes of irritation can often be obtained to advantage directly from the men themselves. They are the ones who receive the complaints and can often give a new fare plan or even an old fare plan both destructive and constructive criticism.

Have You an Adequate Program of Publicity?

PUBLICITY, or advertising as it might more properly be called, is a natural and accepted feature of ordinary business. It has been a feature of the electric railway business, but there is a continuous complaint, may it be said, that the industry is not "getting anywhere" fast enough with the present program. There is a call for more education of the public.

Passing for the present the question of national publicity, what is being done by the various companies locally? Some are carrying on most successful work in this line and the "copy" produced is often most attractive and carries suggestions for use elsewhere. The ELECTRIC RAILWAY JOURNAL is trying to reproduce as much of the good material as it can.

There are two suggestions which might be made as criteria for the coming year, both of which are in use by some companies.

One of these is the suggestion that each railway spend for advertising that revenue which it receives from advertising, from car cards, station posters, etc. It is a legitimate business expenditure, as necessary with electric railways as with other lines of commercial and industrial activity. The electric railway business is a selling business. Over 12,000,000,000 individual sales are made each year, which should amount in 1921 to approximately $750,000,000. Any other industry with such a business would advertise!

The other suggestion is that publicity and information material be so worded that it will leave a question in the mind of the reader, a question of such a nature that he sees that the subject affects his own interests and he will want to answer it. One criticism of much railway publicity matter now is that it is too much like spoon feeding, too much of mere information, all matter of fact, sealed and delivered. Excite the reader's curiosity! Excite his own self-interest! Ask him questions! President Gadsden strikes a good note with his "Ask the Car Rider" slogan, which can well be capitalized in advertising to the riding public.

Above all, have a plan, study the other fellow's work, exchange information and use advertising to sell your product—transportation.

Get a Sales Manager and Put Him to Work

AS THE foregoing figures commence to permeate one's consciousness, there is also the inclination to ask what other business with 12,000,000,000 sales annually, or with a gross sales income of $750,000,000, has no sales management? How some real salesmen would jump at an opportunity where there are already billions of purchasers and where there are other billions of potential customers in the pedestrians, auto riders, stay-at-homes, etc.!

Many companies have done a good deal, when operating and financial problems were temporarily not too pressing, to "merchandise transportation," but usually this has been only when other problems didn't press. This work has devolved, from time to time, on the superintendent of transportation, on the public relations representative, or some one else temporarily available.

What is needed is a sales manager.

A sales manager is primarily, and solely, a salesman and an organizer of salesmen. He ought to have no other duties than to sell rides and to "sell" the idea of the value of a ride. He ought to be a salesman who has been taught the railway game; a salesman first, a railway man second. Most often, railways try to train a railway man to be a salesman. If he has a salesman's instinct, all right, but usually he remains an operator.

Moral: Get a sales manager and sell more rides.

Sloughing Off Detail in Administrative Work

EVERY man who has any executive responsibility finds his time taken up with two distinct types of duties; one covering the broad general principles of his business, the other details largely of a clerical nature. In spite of resolve to the contrary, duties of the second type are apt to take a disproportionate share of attention, partly because they are more tangible and seem to be closer at hand, and partly because it is for most people easier to work with the hands than the head. But executives are paid to work with the head rather than the hands, and if they are to be permanently successful they must turn over to others all duties that the others can perform.

This line of thought has been suggested by editorial calls upon hundreds of electric railway executives, from foremen up. Possibly it is too much to say that most of these men are being hampered by too close attention to detail, but certainly many are. And their departments as well as properties as a whole reflect the influence of undue absorption of the executives in things rather than ideas.

If manufacturers used for any purpose material unnecessarily expensive, the wastefulness of the practice would be obvious. The same principle holds, of course, in the personnel of an organization, although it may perhaps not be so easily detected. One factor in the efficient conduct of every business, therefore, is so to assign the work that expensive men will not be engaged on things which others at lower salaries can do just as well. Another advantage of this plan is that it will usually develop the assistants to take positions of greater responsibility as time goes on.

Nothing Venture, Nothing Win

THE carefree way in which the London County Council Tramways, and later the London General Omnibus Company, could announce so far reaching a change as a reduced off-peak fare, or one good from 10 a.m. to 4 p.m., in the largest city of the world calls for admiration at their courage quite regardless of the economic value of an experiment that has been in force since May, 1920, on the entire tramway system, and since Sept. 27, 1920, on the motor bus lines. With all the enterprise that is associated with the adjective "American" the railway industry as a whole has often been most timid about adopting innovations which later proved their worth.

Thus even the youngest electric railway men today can recall the general belief that there was no better way of collecting fares than that of having a conductor work his way through the car while the then open rear platform remained unguarded. Many had suggested pay-as-you-enter before MacDonald and Ross, but it remained for them as daring operators to prove that the public would appreciate its superiority. This is history known to all. Less known is the fact that W. S. Twining, then chief engineer of the Philadelphia Rapid Transit Company and now Philadelphia's Director of City Transit, designed a pay-leave car as early as 1907 (see *Street Railway Journal*, Jan. 18, 1908). Apparently the idea made no appeal to the then Philadelphia management, nor did the average operator believe that it would be as practicable or desirable to get the fare after the ride was taken rather than before. It conjured up in his mind visions of people leaving cars en masse during a blockade and refusing to pay any fare even after a long ride.

Mr. Twining was simply ahead of the group imagination of his day, for after Peter Witt, as Street Railway Commissioner of Cleveland, had persuaded the Cleveland Electric Railway in 1911 to try several types of pay-leave cars, the idea took hold and made good in a large number of cities. The honest belief of many operators that their patrons would be unalterably opposed to modern one-man car operation is too fresh in memory to require recalling.

Knowledge of these incidents in the history of the industry should drive groundless fears out of the heart of the operator who wants to try something new in the way of equipment or fares practice. He may rest assured that if his idea holds something of worth to his patrons they will put up with the inconvenience involved in the change, provided always that his plan and motives receive due publicity.

Do the Electric Railways Need Any More Technical Graduates?

AT THIS time of the year the prospective five thousand graduates, more or less, of a hundred technical schools are beginning to wonder what they are going to do after commencement. Already the manufacturing and some other industries are planning to send representatives to the colleges to explain to the young men, and young women too in some cases, the attractions of their several fields of activity. The electric railways will not be so represented. This is partly because there is no central organization for the electric railways which takes up matters of this kind, and individual railways do not need enough men to warrant them in going to the expense of sending "scouts" to the colleges. It is doubtful, also, if the value of a technical education applied to the right kind of an individual is appreciated as much by the railways as in manufacturing. Possibly the value is actually higher in the latter field, but this ought not to be so.

At any rate, the manufacturers and a few others will get the choice of the educational crop and the railways will take what is left, including, however, those young men who have heard the "call of the rail" and will insist on going into transportation work in spite of lack of invitation and even, if necessary, of opposition. Luckily, this number is considerable.

There are many excellent opportunities for technical graduates in the electric railway and related fields. The whole business is founded upon civil, mechanical and electrical engineering. Of course, the focus of interest has shifted somewhat in recent years from track, power plant and line to fares, schedules, accident reduction, etc. But fundamentally transportation is a proposition of moving people and goods from one point to another with a maximum of speed, economy and safety. As long as this is so the business will need engineers.

Furthermore, the principles underlying engineering have application far outside the engineering divisions of the field and engineers are making themselves useful in the transportation, purchasing, accounting and other departments. They are especially useful in the making of appraisals, either in the railway organization or without; a phase of the work which is bound to become more and more important.

It is too bad that some systematic way has not been provided by which the electric railway field can be explained to engineering students. Some schools have courses in transportation engineering, which serve an excellent purpose, but they need to be supplemented by talks from competent railway executives or their representatives. This would seem to be a line of work for the American Electric Railway Association and American Railway Association to take up on behalf of their respective clienteles.

Refunding Is a Problem in the Face of Present Tax Exemptions and Income Tax Laws

ONE of the big financial problems in the electric railway field during 1921 is how bond issues maturing this year will be refunded. The topic is one which is to be considered at length at the mid-year meeting of the American Electric Railway Association and the thought here is not to anticipate the subject as presented at that meeting but to give a few figures to emphasize the importance of the topic to the electric railways and the communities which they serve.

According to the census report in 1917, there was in that year outstanding in funded debt $3,068,377,167 on which the annual interest paid was $110,506,977. If twenty years is assumed as the average life for these bonds, those maturing each year would aggregate about $150,000,000; this average would be reduced to about $100,000,000 if a thirty-year average life of bond was assumed. Actually, the figures would not be quite so large as these, since the companies in the hands of receivers may be considered as being relieved of the necessity of caring for their maturing issues. Practically 15 per cent of the funded debt of the electric railways mentioned above was issued by companies now in receivers' hands.

It is obvious that all refunding issues of bonds issued now will have to carry interest rates much higher, to make them sell at par, than those bonds whose place they take. Most of the earlier bonds were put out at a time when the common interest rate for the average utility bond was 5 per cent. Some of the longer seasoned issues bore only 4 per cent interest. Now, when government bonds with many tax exemption features sell on a basis of from 5.20 per cent for the longest term to 6.40 per cent for the 1928 maturity, it is easy to see that electric railway bonds will have to carry a considerably higher rate. Another difficulty which utilities will meet in endeavoring to sell their bonds is that under the present income tax law surtaxes, the purchase of any securities which are not tax exempt is practically out of the question for those with large incomes. It has been determined, for instance, that a man with $100,000 taxable income can pay only 68.08 for a 5 per cent bond to have it net him 5 per cent, while a man with a taxable income of $300,000 can pay only 26.51 for the same bond to get a 5 per cent net yield. Hence, a considerable market which formerly existed for public utility bonds has now been practically cut off. This emphasizes the necessity for electric railway companies to develop local markets for their securities.

It is to be hoped that in any modification of the income tax effected by Congress this handicap will in some way be overcome, but, until that is done, even electric railways with a good income and "credit re-established" will have difficulty in selling bonds except at a high rate of interest. This means that many conceptions by the public of what constitutes a "reasonable rate of return" on the value of electric railway property will have to undergo modification.

Quotation from the Federal Electric Railways Commission Report

No. 8

WHILE the electric railway industry is essentially local, it has certain national characteristics. Its difficulties cannot be regarded simply as the isolated problem of a local system repeated hundreds of times all over the country in varied forms and degrees, each problem being independent of all the others. On the contrary,....a local traction system....is....inseparably connected with all of the others,.... The close industrial and financial interdependence of the hundreds of physically unrelated local traction systems, the millions of dollars of capital placed by thousands of investors in plants which manufacture electric traction equipment and the five billions of electric traction bonds and stocks to be found scattered all over the country in banks, insurance company reserves and in private investment translate the many local problems into a national problem.

Anticipate the Automotive Age in Your Building Plans

THERE is so much more hindsight than foresight in this world that we may be pardoned for making a suggestion that may seem a little premature today, namely: Try to make sure that the shop or storage plant you plan today will not have to be reconstructed at great expense to care for a corps of automotive vehicles. By the latter we do not mean merely the gasoline utility trucks, of which electric railways already operate hundreds, but we also would make provision for future motor buses and freight-carrying motor trucks.

This does not imply that electric railways should forthwith arrange for the special equipment that goes with gasoline operation. What is suggested is that due consideration be given to the character of cellarage, foundation and partition walls, flooring, etc., for two purposes: First, that of easy rearrangement of spaces; second, that of better protection against fire and freezing than is required in a purely electric installation. Furthermore, whether gasoline or trackless trolley buses are in the offing, it will be well to consider what clearances in height and width should be allowed—a matter that may cost little yet save much—and also what conveniences are required to make easier the inspection and repair of equipment. Probably a study of layouts in the larger, high-grade garages and of the practices of the New York and Chicago motor bus companies would prove helpful in this respect.

Neither would it be a bad plan to see what local garage storage and maintenance facilities could be used without going to the expense of putting up a lot of gasoline equipment buildings. An electric railway equipment structure is necessarily special and has to be built at the railway's expense, even if only a dozen cars are to be housed. A few score automotive equipments, on the contrary, if scattered about the system, might be cared for most advantageously by large public garages if the electric railway management secures the wholesale rental and repair rates to which a big, steady customer is entitled.

St. Louis Plans Rapid Transit

Two Independent Reports for the Development of High-Speed Service and for the Relief of Metropolitan Congestion—Subways for Surface Cars Are a Feature of Each Plan—A Direct-Payment Plan of Charging One Cent Extra on Each Fare Is Suggested as a Means of Financing

TWO independent plans presented last fall in St. Louis deal with the future rapid transit development which is felt to be necessary in that city. One of these plans is a report on a "Proposed Rapid Transit System for the City of St. Louis by the Department of Public Utilities of the City," James A. Hooke, director; C. E. Smith, consulting engineer. The other plan is in the form of a preliminary report by the City Plan Commission of St. Louis, Mo., which is making an all-inclusive study of a general city plan for St. Louis and is proceeding on the basis of making preliminary special studies on each phase of the plan. This present rapid transit report is, therefore, one of these preliminary special studies. The latter report does not discuss the financial side of providing the rapid transit facilities, but refers to what it calls the "interesting discussion and proposal for financing rapid transit construction," which forms a part of the Department of Public Utilities' proposed system.

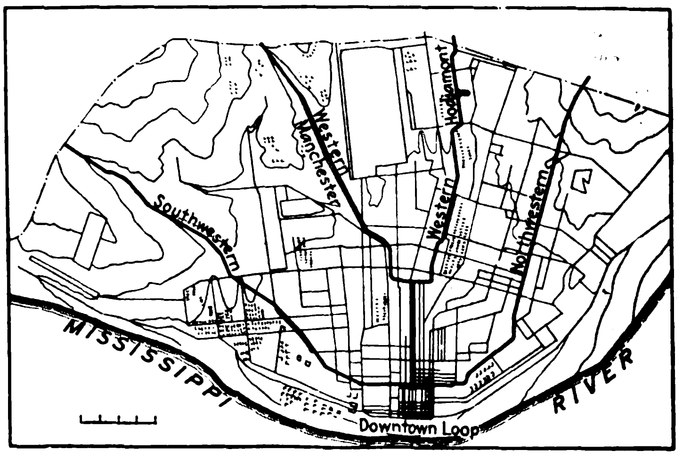
Naturally, all preliminary plans, such as both of these are, are subject to material modification before a system is in actual existence and operation. The studies, in the present stage, however, afford an opportunity to analyze and appreciate some of the difficulties of laying out a rapid transit system where none now exists, and also some of the possibilities where present rapid facilities offer no limitations to a comprehensive scheme.

THE PUBLIC UTILITIES DEPARTMENT PLAN

Considering the plans in the order in which they were presented to the city, the plan of the Department of Public Utilities apparently looks further into the future than the preliminary plan prepared by the City Plan Commission. Both studies are based upon the same traffic investigation figures, namely, those made by the City Plan Commission.

The Public Utilities plan mentions three principal means of separating automobiles and street cars: (1) By improving paved streets for the exclusive use of automobiles and concentrating the street cars in the fewest possible streets consistent with good service; (2) by widening streets containing street cars, more particularly where these streets are paved for heavy automobile traffic; (3) by placing street cars in underground subways in the congested business districts and providing subways and elevated lines for rapid transit trains between the business and residential districts.

This report points out that there has been no real extension to the system for the past fifteen years, during which the city has increased about 25 per cent in population and the suburban communities have increased more than that. Accordingly this plan includes not only a bettering of the present transit facilities but also the necessary growth to handle the increased population and its modified geographical distribution.



RAPID TRANSIT ARTERIES PROPOSED BY CITY PLAN COMMISSION

The proposed development has six phases, the first of which is an immediate procedure, the five others following gradually but simultaneously. The first development is an immediate rerouting to expedite movement of cars and give better service. The details of this are largely of local interest and follow in principle rerouting studies made in other urban centers. It is interesting to note, however, that the proposed rerouting would make it possible to remove about 35 miles of single track of the present system, and the abandonment of this trackage would make possible the construction of about 15 miles of double-track extension with the money that would be spent in renewal of abandoned tracks.

The other developments are: Extension of radial and crosstown lines; subways for surface cars in congested districts; rapid transit subways and elevated lines; downtown stations for steam railroad suburban trains, and subway loops for Illinois interurban cars. The extensions of surface lines include both additions to radial lines and construction of some new crosstown lines, totaling approximately 65 miles of double-track extensions in the preliminary estimate.

The recommendations for subways for surface cars in the congested districts and the development of rapid transit subways and elevated lines are clearly indicated by the accompanying map. A total of 10 miles of surface car subways is shown on the plan, about 3 miles of which it is recommended be provided within the next five years. After the completion of the rerouting and the surface car subways, a total of about 95 miles of single track surface lines could be taken up.

It will be noted that the rapid transit plan contemplates double track in most of the mileage, but suggests three tracks to provide express service in the direction of heavy travel in some parts of the system. No differentiation is made between elevated and subway rapid transit lines as this is impracticable at the present time. Ornamental reinforced concrete viaducts are recommended for whatever elevated lines are built.

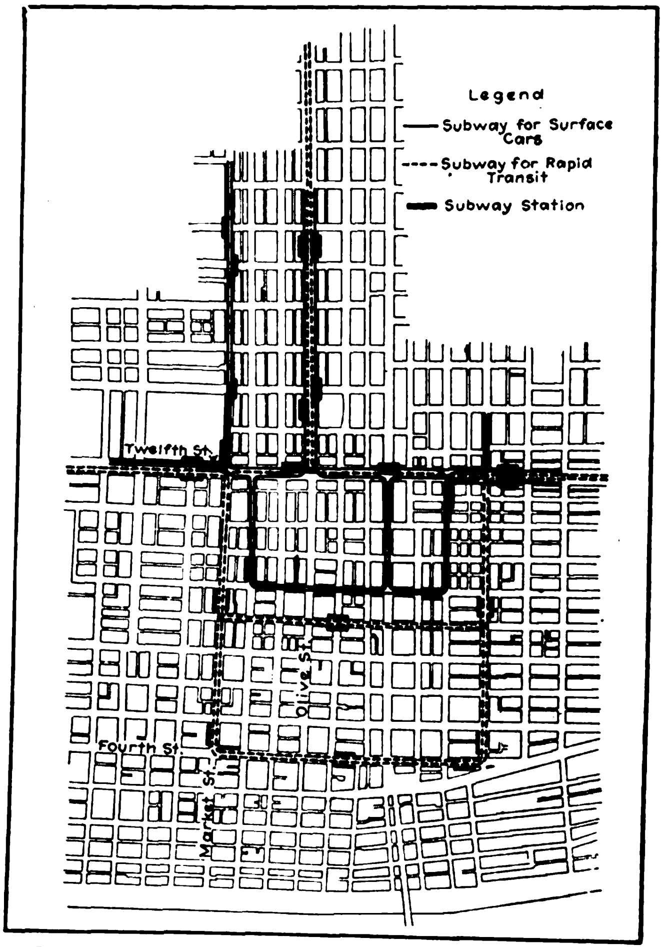
The estimated cost of three-track subways is $6,000,000 per mile and three-track elevated $1,500,000 per mile.

One of the elements of this transit development plan is the continued use of suburban steam railroads rather than surface or rapid transit electric cars. Those who are familiar with St. Louis will appreciate, however, that the present Union Station is too far removed from the business center to be useful as a commuter station. A double benefit would therefore be derived by building a separate station for trunk line suburban traffic in that this will be brought close to the business center and at the same time the elimination of the suburban trains from the Union Station would increase its capacity for handling through trains. Naturally, future electrification of the suburban trains and the area occupied by the Union Station is anticipated.

As indicated by the plan, it is contemplated to bring the interurban railways entering St. Louis across the river from Illinois onto an interurban loop which will be principally underground.

This report points out that the system of surface lines and rapid transit lines should be operated as one, similar to the Boston Elevated Railway, remarking on this point as follows:

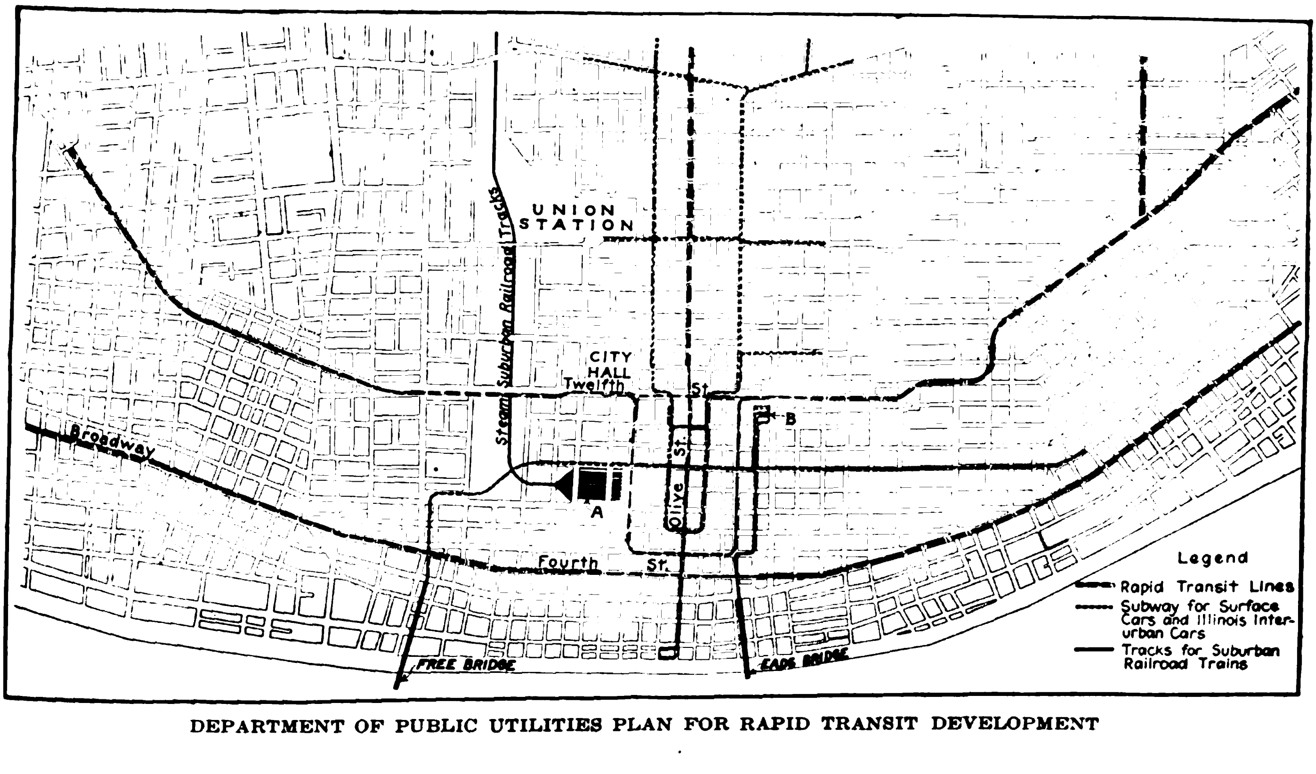
> It is not possible for St. Louis to have such a rapid transit system unless it be operated as a part of a surface system. If each were operated separately the rapid transit system would experience great difficulty in securing enough traffic to pay expenses except at high fares. The resulting decrease in travel on the surface lines would make necessary an increase in fares to pay their expense. By operating them as one, with universal free transfers, the surface lines become able to give the rapid transit lines the necessary density of travel and the service and cost of operating the surface lines can be reduced as passengers are turned over to the rapid transit lines.


Legend
Subway for Surface Cars
Subway for Rapid Transit
Subway Station
Twelfth St.
Olive St.
Fourth St.
Market St.

DOWNTOWN RAPID TRANSIT LOOPS PROPOSED BY CITY PLAN COMMISSION

FINANCIAL PLANS

It is estimated that the total cost, not including the suburban railroad station nor the interurban subways, would be somewhere in the vicinity of $200,000,000. Naturally, this could not be spent at once, nor could it be provided at once. A direct payment plan is recommended to finance the construction contemplated in the plan. By direct payment plan is meant the collection of one cent with each street car fare and the application of this money to the construction of the system. In the beginning it is stated that this amount, one cent, would have to be added to whatever other fare might be con-


UNION STATION
Steam Suburban Railroad Tracks
CITY HALL
Twelfth St.
Broadway
Olive St.
Fourth St.
A
B
FREE BRIDGE
EADS BRIDGE
Legend
Rapid Transit Lines
Subway for Surface Cars and Illinois Interurban Cars
Tracks for Suburban Railroad Trains

DEPARTMENT OF PUBLIC UTILITIES PLAN FOR RAPID TRANSIT DEVELOPMENT sidered necessary, but as various improvements become effective, it is predicted that the charge would be partly and perhaps wholly offset by decreased cost of operation, with the ultimate result that the fare on the rapid transit system would be no higher, and probably considerably lower, than if the facilities had not been provided.

From the traffic studies made in St. Louis it is estimated that the sums given below would be available for rapid transit construction. This table contemplates an increase of 2½ per cent each year to the number of fares collected in the preceding year, which estimate is apparently borne out by past experience.

Year	Amount Each Year	Total to Date Without Interest
1920	$3,000,000	....
1925	3,394,225	$16,163,311
1930	3,840,254	34,450,402
1935	4,344,894	55,140,676
1940	4,915,848	78,549,818
1945	5,561,830	105,035,110
1950	6,292,701	135,000,788
1955	7,119,613	168,904,203
1960	8,055 188	207,262,801
1965	9,113,707	247,662,036
1970	10,311,324	299,764,273

On the above basis there will be provided in the next twenty-five years about $100,000,000. Mr. Smith estimates that the rate of increase will be greater and that one cent will amount to $200,000,000 in less than forty years, and in the meantime construction could start immediately and proceed at the rate of $3,000,000 for the first year, $3,500,000 per year by the second year, etc.

Three methods of financing by bonds are suggested as alternates: (a) City to raise the money for the sale of bonds to be paid off in twenty years according to the present practice; (b) city to raise the money by the sale of bonds and create a sinking fund to pay them off in thirty to fifty years; (c) private company to raise the money by the sale of bonds and create a sinking fund to repay them in fifty years. An extended analysis of the working of each of these three schemes is given.

It is recommended that the city proceed immediately upon a program which would contemplate some such construction as outlined, and it is stated that the city has the necessary legal authority to proceed with the program outlined without any change in the city charter or the state constitution. It is further stated that the ownership of the rapid transit facilities should be held in the city. They should be operated by the city if municipal ownership and operation comes to pass, otherwise their use should be permitted in the same manner as the streets which they supplant under such conditions as seem appropriate.

THE PLAN OF THE CITY PLAN COMMISSION

The report of the City Plan Commission is of course similar in character to that of the Public Utilities Department in that it quotes the traffic study and shows the limitations of the present system. It is accompanied by some very illuminating maps showing graphically the results of the traffic studies and also picturing regions not now reached by any satisfactory transportation service. It also shows the proposed car lines and isochronal zones for present and proposed routing.

The physical difficulties peculiar to St. Louis on account of the elliptical shape of the city, with the business district located at the extreme outer edge, are emphasized. The commission states that present tendencies with respect to the distribution of population seem to indicate that these difficulties are becoming more pronounced than ever before.

The City Plan Commission recommends that a rerouting of street car lines producing more direct service will meet the present needs of the city without the construction of rapid transit lines. St. Louis is a sprawling city and needs a greater intensity of development within the intermediate central areas before rapid transit facilities will be justified. Eventually St. Louis will need rapid transit facilities, though that day may be ten or twenty-five years hence. The commission therefore recommends in anticipation of this time and in order to relieve one of the more acute transit conditions of today in the congested business district that there be a subway constructed for surface lines, which subway may be so designed as later to form a part of a comprehensive subway system for rapid transit services.

There seems to be no difficulty, according to the commission, of locating satisfactorily at this time the necessary rapid transit lines of the city. Following out this thought, the commission laid out a proposed rapid transit scheme, which is shown in an accompanying map, the details of the downtown or congested district part of the map being shown in a separate drawing. It will be noted that the area covered by the City Plan Commission map is much greater than that covered by the part of the map of the Public Utilities Department.

The City Plan Commission report also calls attention to the fact that the development must be gradual and that the first step is an immediate rerouting of some of the present surface lines. Even this move is divided into three steps, a primary and immediate rerouting, secondary rerouting of transit lines, and a third or final step giving the complete rerouting of surface cars and the installation of subway routes in the business district. There is considerable discussion of the theory of loops, particularly subway loops for all surface cars, in the report. It is estimated that the initial short loop subway for surface car operation would cost about $17,000,000, and the complete rapid transit scheme including the downtown rapid transit loop and route to the various parts of the city as shown on the map would cost $80,000,000, making a total of $97,000,000 for all of the construction for rapid transit purposes and for removing practically all of the surface cars from the surface of the streets in the business districts.

It is planned that there will be no contact of the two systems, namely, the subway for surface cars and the distinctive rapid transit system, except that the systems may be operated in common. The two systems would operate in separate streets, so that they would both be as near the surface as possible.

Under the final plan it is estimated that there will be a possible abandonment of 66.97 miles of single-track surface and the construction of about 33.45 miles of new single track (exclusive of track in subways). Extension of existing lines amounting to 62.67 miles of double-track construction is also proposed.

As a result of a year's experience, the American Engineering standards committee has completely redrafted its rules of procedure. Copies of the revised rules can be obtained by addressing the committee at 29 West Thirty-ninth Street, New York City. The rules are brief and are confined to definitions of the several types of co-operating bodies and to the ways in which the committee functions in the development of a standard.

Unit Idea in Power Station Design

The Author Shows How the Unit Principle, Which Has Produced Good Results in Equipment Construction, Can Be Fruitfully Applied to Generating Plants as a Whole—The Plan Described Differs from the Designs Which Have Usually Been Known as Unit Designs in that a Unit Is Considered as Complete in Every Part

By LOUIS R. LEE
Chief Engineer E. W. Clark & Company Management Corporation, Columbus, Ohio

UNIT power plants, as designed and built by this company, are the outgrowth of experience gained in the operation and construction of steam plants over a long period of years. Also as operators of steam power plants we have become familiar with the common run of limitations of old and new plants built according to the cut-and-dried method. These limitations consist largely of high generation costs and the difficulty of making extensions at reasonable unit cost. Within their scope these experiences have not been materially different from those met by other utility operators.

The steam power plant for the generation of electric current has necessarily experienced a great many changes in the past twenty years due to the improvements in the equipment offered for this class of service. However, the equipment now offered by various manufacturers has reached a similarity in design which shows that a certain standard of development has been reached, and it is now not so likely to undergo radical change.

We must expect and hope, of course, that there will be detailed improvements in the make-up of various kinds of equipment. Some of these changes will be called for due to change in natural conditions, others due to characteristics of electrical load which must be carried, etc. However, we have today a much better line of equipment to select from than formerly, all of which can be purchased in a variety of sizes without much change in the efficiency, quality or general make-up of the piece of equipment itself. It is possible today to purchase turbines of from 7,500-kw. to 35,000-kw. capacity that do not differ materially in economy, operating characteristics, shape and general make-up.

We may even extend this generalization to unit first cost. The same truth may be told about other lines of equipment, the difference being only in degree, according to the nature of the service for which the equipment is used. To date, however, no such result has been secured for plants as a whole, but it seems to the writer that the time is ripe for such application.

WHY NOT STANDARDIZE THE POWER PLANT?

Progress has been made in standardization of equipment. We now need to secure similar benefits in power-plant assembly. Not much general progress has been made toward getting away from the idea that the plant must be a complete structure built especially for each particular locality. In other words, the design of plants has not kept pace with the design of equipment which has been used in the plants.

Standardization of assembly and general simplicity in arrangements are both badly needed. In some directions progress is being made. For example, it is becoming more or less apparent that we are going to arrive somewhere in the standardization of the use and application of electric current for all localities. For example, we have fewer frequencies than we used to have, there being practically only one standard for new plants, that is, 60 cycles. Other frequencies are used only where necessary to conform to existing conditions. Anything other than three phase and single phase is considered freakish. Much in the same way voltages are approaching uniform standards, and like improvement along other lines of standardization could be cited. Therefore, it is becoming more and more possible, feasible and practicable to look upon any and all electric power plants as simply sources of supply for so much electrical energy, the essential aim of the plant being to produce electrical energy at the lowest possible cost, reliability and continuity of service being accepted as a matter of course as among the prime requisites in all power plants.

THE TERM "UNIT" IS APPLIED TO OTHER THAN PRIME MOVERS OR BOILERS

In the unit design which this company has evolved the principal essential is that a plant is built up of units which are complete in every part and will operate and function as units, furnishing some fractional part of the total requirements of the power plant.

A power plant may be divided into several parts, depending somewhat upon the service given, but the plant as a whole naturally falls into two divisions, the first being the part which generates steam and the second that which generates electrical energy by the use of this steam. In other words, we have the boiler plant and the turbine plant. The turbine, with condenser, must be the principal unit of the turbine plant, with other units taking care of circulating water, air washing, electrical connections and other lesser units required for the complete functioning of this turbine plant. In the boiler plant there are boiler, economizer, furnace and draft equipment, as the greater unit with the lesser units that take care of coal supply, ash removal, feed-water supply and so on.

In unit plants so far built the term "unit" has usually been applied to the plant as a whole. Thus a 75,000-kw. plant made up of three 25,000-kw. turbines would be styled a three-unit plant, a certain number of boilers, auxiliaries and a turbine being one unit. In our plan the scheme is different, in that the "units" are independent of each other, but may be used collectively to accomplish some desired result. Thus we have boiler units, turbine units, coal supply units, and so on, each unit being a complete entity in itself with minimum interconnection with the plant as a whole. Similar progress in the design of automobiles may be cited. The engine, change gears and electrical equipment are now a unit on the modern car; the chassis, the frame and the rear axle are other distinct units which may be separated with minimum effort from the car as a whole for purposes such as repairs.

In the "unit power plant" design referred to the size of the individual units will vary according to the forecast of the ultimate size of the whole plant, but otherwise their characteristics will remain unchanged. The essential features of the designs of the different units are the same, and the benefits of standardization and design of details are achieved and made use of in a small plant as in a large one. Also there is in the small plant, and in the large one as well, a minimum investment involved in interconnection, in assembly and in total space required for the equipment.

FIXED CHARGES CAN BE KEPT DOWN BY CAREFUL PLANNING

One of the greatest burdens of the steam plant are fixed charges which result from a large investment, this investment having grown up gradually due to a chain of circumstances which result in a very large fixed charge made up of interest on the investment, taxes, insurance and depreciation. It would only be fair to say, of course, that up to this time much loss has been experienced due to change in design and improvement in the art. However, a great deal of unnecessary investment has been caused by lack of comprehensive plans; by too much tacking on the auxiliaries, piping, by-passes and other agents for interconnection of auxiliary equipment to provide for freak operating schedules. The result of this lack of clean-cut simplicity in design in power plants has been that repair costs have been high, reliability has been endangered and the economies have not been as high as they should have been if the equipment had been properly installed.

Much has been accomplished in recent years in the operation of mills and various manufacturing operations under scientific management. Not a little of the gain has been secured by planning systems, in other words maintenance work has been systematically taken care of under a planning scheme. The unit power-plant plan lends itself wonderfully well to a planning scheme. For example, the boiler units, made up of draft, stoker, boiler, economizer and feed-water equipment, can be repaired, inspected and thoroughly overhauled in a single operation by a comparatively small crew of men. As all of this work is done with the entire unit shut down, isolated from the rest of the plant and in no way endangering the reliability of service, these repairs can be made at minimum cost with convenience to the operators and to the operation of the station as a whole. This same holds true of any unit in the plant, including the turbine, the coal handling and other features.

Our plan is designed to insure low labor cost. In accordance with it the plant is made up of a number of units of predetermined size, any one of which will function as a fractional part of the plant as a whole. Thus, there is a minimum expenditure involved in interconnecting the units with each other, and in providing housing for the units. All units are so arranged that practically all operation can be taken care of from one floor level and all repairs can be taken care of with minimum interference with other units which remain in operation.

There are also many collateral advantages that result from building up a plant of complete units. As improvements in equipment are brought out by manufacturers, the new units which may be added to the plant can embody these improvements without interfering with or curtailing the full value obtained from the existing equipment. In plants with which we have had experience it has sometimes not been thought feasible to take advantage, from time to time, of improvements in equipment due to the fact that this would make it necessary to make radical changes in the arrangement of the equipment already installed. The unit idea has enabled us to get around many of these difficulties. It has also been possible to make more compact assembly of equipment, making important savings in building space. Practically every feature employed in unit power-plant design has been used in one or more plants, although there are many improvements in the latest designs that have not all been made use of in the same plant.

The unit design lends itself to rapid construction and allows taking advantage of many of the benefits in construction methods which heretofore have only been secured in the manufacturing plants. Also, standardization of assembly of equipment simplifies operation, requiring less study on the part of the operators of the arrangement of the station, because with all units of each class similarly constructed it is only necessary for an operator to understand the operation of a single unit of each class to understand the operation of the plant as a whole.

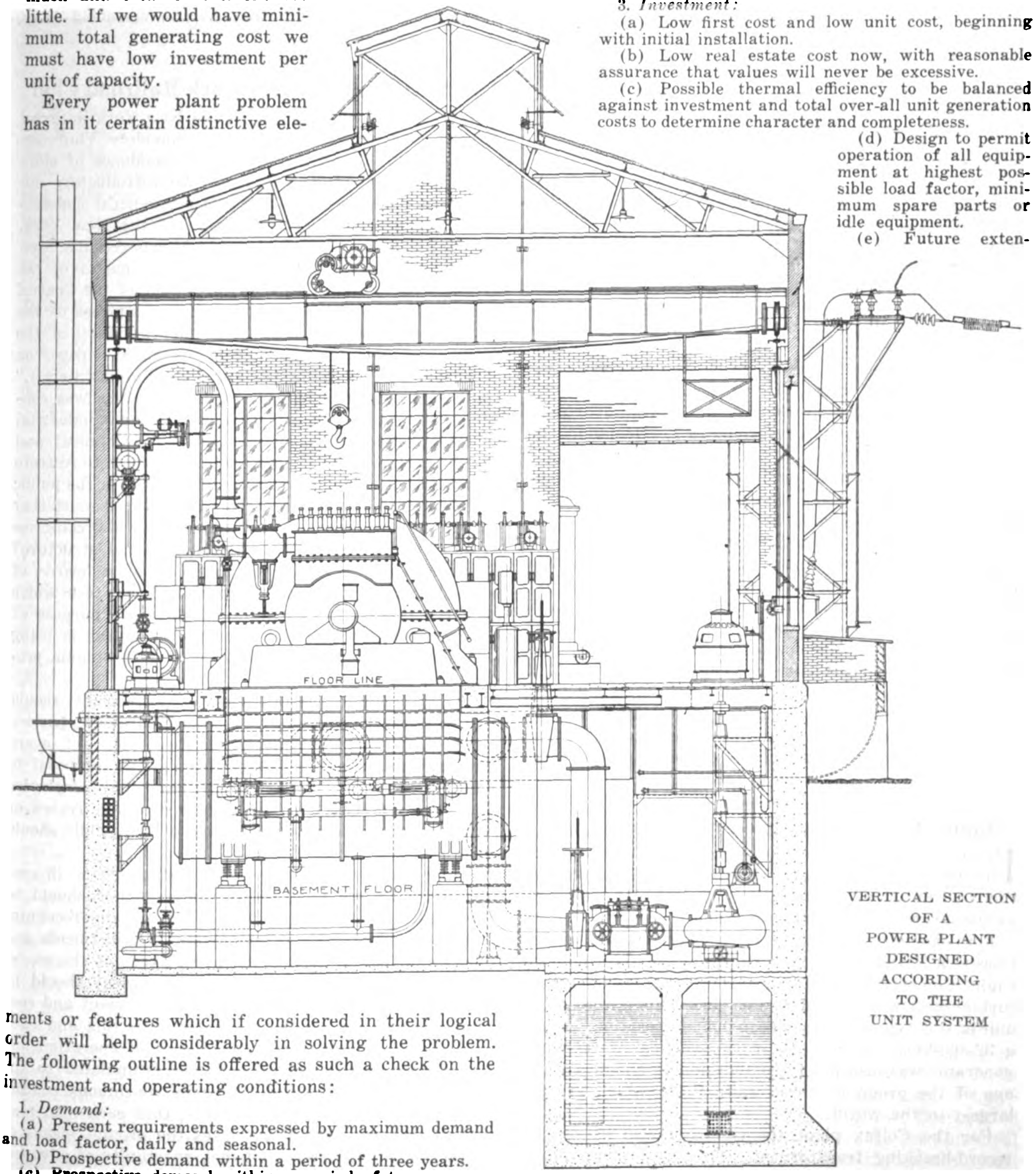
Any one who has had long experience in steam-plant operation appreciates that a great deal of the unlooked-for expense in steam-plant operation has come from expensive repairs which have been called for due to special arrangement, the repairs having to be made in a very short space of time. Furthermore, curtailment of output has frequently been caused by the necessity of shutting down certain parts of the whole plant in order to make repairs to individual pieces of equipment. The plant that is built up as a complete structure rather than as a group of complete units will be subject to much interruption of service, high maintenance cost and general unsatisfactory operation. This is illustrated by the fact that individual electric-motor drive owes much of its merit and popularity to the fact that it makes units of the machines to which it is applied.

SITE SHOULD NOT EXERT TOO GREAT AN INFLUENCE

Special conditions, such as real estate limitations, have called for extraordinary effort in design along some lines, but in many cases the limitations which existed have been accepted too complacently and allowed to influence the great investment in the plant as a whole, with very bad effect on economy in the long run. Limitations peculiar to a locality should receive careful study before they are allowed to increase unit investment costs. Fixed charges run on for all time and no amount of engineering talent can reduce the fixed-charge part of the total power cost except by increasing the load factor of the plant. After the initial investment is made the total will always be increasing if the plan which has generally been followed up to this time is continued; in other words, if a plant after being built is constantly receiving additions in the way of piping, auxiliary equipment, small changes in buildings, etc. On the other hand, if the plant is laid out in a simple, clear-cut manner, and if changes are made only as additional capacity is needed, each part of the plant being originally built at minimum cost, the fixed-charge burden then on the output will be a minimum.

Under present conditions the fuel item of power-plant operating cost is a very large one, and much thought must be given to the boiler plant to insure that all available heat generated by expensive fuel is used to the very best advantage. However, it is probable that fuel costs are now as high as they will be for a number of years and most localities have probably experienced their maximum fuel costs. But even with these high fuel costs, fuel economies have been emphasized too much and total investment too little. If we would have minimum total generating cost we must have low investment per unit of capacity.

Every power plant problem has in it certain distinctive elements or features which if considered in their logical order will help considerably in solving the problem. The following outline is offered as such a check on the investment and operating conditions:



VERTICAL SECTION OF A POWER PLANT DESIGNED ACCORDING TO THE UNIT SYSTEM

1. *Demand:*

(a) Present requirements expressed by maximum demand and load factor, daily and seasonal.

(b) Prospective demand within a period of three years.

(c) Prospective demand within a period of ten years or more.

2. *Location:*

(a) Railroad or shipping facilities.

(b) Good water supply.

(c) Low freight rate on fuel.

(d) Earth that will allow permanent foundations to be constructed at reasonable cost.

(e) Freedom from floods or other natural disturbances.

(f) Good quality of labor should be available, or there should be sufficient and satisfactory space where labor quarters may be built.

(g) Space for adequate fuel storage, and expansion for future requirements.

(h) In general plant should be located as near center of distribution as possible while meeting the conditions given above.

3. *Investment:*

(a) Low first cost and low unit cost, beginning with initial installation.

(b) Low real estate cost now, with reasonable assurance that values will never be excessive.

(c) Possible thermal efficiency to be balanced against investment and total over-all unit generation costs to determine character and completeness.

(d) Design to permit operation of all equipment at highest possible load factor, minimum spare parts or idle equipment.

(e) Future extensions taken care of by design and plans with least investment possible in building or other material provision for such extensions.

4. *Fuel Supply:*

(a) Value of fuel or waste heat available, to be determined by unit cost per kilowatt-hour of output, giving due consideration to probable boiler capacity that it may be practicable to obtain.

(b) Supply should be permanent and not liable to seasonal shortage.

(c) Some fuels may generally fill these requirements but have other peculiarities or disadvantages.

5. *Labor:*

(a) Design that will permit use of least number of men and of least highly skilled men, while giving uniformly satisfactory results.

(b) One-level operation with controls centralized or grouped, enabling labor to produce best performance with least effort.

(c) All equipment of like nature similarly arranged, enabling all operators to have clear understanding of plant requirements.

(d) Accessibility of chief requisite, facilitating inspection and maintenance.

(e) Good working conditions, considering light, ventilation, temperature, sanitation, transportation, facilities or proximity to good living quarters.

6. *Supervision:*

(a) Complete complement of indicating and recording instruments to give ready check and record of performance.

(b) Facilities should be such that unit quantities of fuel, steam and electrical energy may be obtained, recorded and be available for comparison and checking at all times.

(c) Facilities to be provided for keeping plant records, storing supplies, tools and repair parts.

(d) Plant must have best possible means of communicating with distributing centers and of communicating or signaling within plant.

While every item in the above outline deserves careful consideration, it is believed that there are some which are generally overlooked or their importance minimized. For example, referring to 1, "Demand," the future for, say, ten years is either ignored or too much emphasized, often resulting in poor ultimate layout or a carrying of much idle investment. The future must be considered, but should be taken care of as far as possible by design rather than by material investment.

Fuel is only cheap when its use results in cheap power and allows a minimum investment in boiler plant. We should not be concerned over thermal efficiency so much as plant efficiency, which takes into consideration fixed charges as well as the operating costs. For example, a certain boiler installation when operating at 175 per cent of boiler rating may have a very high efficiency, but if the boiler cannot be pushed to at least twice this rating and still maintain a good efficiency for boiler plant as a whole then the layout is undesirable by the amount it may fall short of some such result.

Some Very Large Electrical Apparatus

IN ITS annual review of engineering accomplishments the Westinghouse Electric & Manufacturing Company this year mentions several pieces of electrical equipment as the largest of their several kinds.

For example, at the Colfax power station of the Cheswick Power Company, a subsidiary of the Duquesne Light Company, a 60,000-kw., 60-cycle, triple-element turbine unit was started on Dec. 18. This is the second unit of this type which has been put in operation. Again, a 32,500-kva., 25-cycle, 150-r.p.m. vertical water-wheel generator was also put in commission at Niagara Falls, one of the group of three units there which are the largest in the world.

For the Colfax plant the company also supplied a record-breaking transformer. This is a single-phase, oil-insulated, water-cooled transformer of 23,600-kva. capacity. It transforms 60-cycle current from 12,000 to 132,000 volts. There are also under construction in the shops a group of seven 12,000/220,000-volt, 60-cycle transformers of 16,667-kva. capacity for the highest commercial voltage yet adopted for power transmission. They are for the Pacific Gas & Electric Company.

To the Philadelphia Electric Company two 1,750-kva. induction-type regulators were supplied for use on the low-tension side of the transformers supplying the two 66,000-volt tie lines between the Schuylkill and Chester power plants of this company.

The review refers also to a new face-plate type of voltage regulator which has been devised to perform the same service as that furnished by the vibrating relay type of regulator.

1,750 at Dinner of New York Railroad Club

THE second annual dinner of the New York Railroad Club was held at the Hotel Commodore Thursday evening, Dec. 16, and there was an attendance of more than 1,750 members and guests. An introductory address was made by John A. Droege, general superintendent of the New York Division of the New York, New Haven & Hartford Railroad, who has recently been elected president of the club. The toastmaster of the evening was William G. Besler, president of the Central Railroad of New Jersey. The principal address of the evening was made by James A. Emery, counsel of the National Industrial Council, who presented a paper on "Transportation Combinations and the Public Interest." The principal theme of Mr. Emery's address was contained in the questions, Do our modern industrial societies possess adequate powers of self-defence? and Are the people of the United States powerless to restrain a combination of those voluntarily engaged in the public service within the limits of social safety or must they submit to the unrestricted exercise of its collective power even though it imperils their social structure? He discussed the matter of national labor boards of adjustment and in concluding submitted four tests which appeared to him to determine whether the purpose of Congress as stated in the transportation act is being executed and the supreme interests of the public protected. The tests are:

1. No mode of adjustment or agreement should receive approval that does not assure a review, participated in by representatives of the public, of every serious controversy or negotiation. Any proposal to establish relations between carriers and their employees the purpose or effect of which is to eliminate review or supervision by the representatives of the public should be rejected.

2. No form of adjustment or agreement is in conformity with the purpose of Congress nor should be approved by the board that does not equally recognize and protect the rights of employment, adjustments and representations of unorganized employees of the roads.

3. No form of adjustment or agreement should be approved that does not safeguard the efficient and continuous operation of train service. To this end each road should be considered as the unit of operation and self-interest, management and men stimulated to the cultivation of personal relations by continuous contact between executives and employees, that each man may find in the road which he serves the prompt means of protecting his interests and the opportunity of advancement through merit.

4. Since the public interests require the assurance of uninterrupted service, the board should ask the carriers and their employees, in whatever form agreement between the respective roads and their employees take, to accept without strikes or lockouts the ultimate decision of the board upon any question within its jurisdiction.

Trackless Trolley in Two British Cities

Bradford, with Three Routes in Operation, Is Planning Three More—The Buses Are Used as Feeders for the Trolley System—A Double-Deck Trackless Trolley Bus Has Just Been Put in Service—Keighley, After Five Years' Experience, Has Added to Its Equipment and Now Has Nine Buses in Service

A REVIVAL of interest in the trackless trolley is apparent in this country, although it is not clear whether this interest is sufficiently deep-seated to lead to the construction of many roads of this type in the early future or not. For our experience with the trackless trolley we must go to Europe, for there, as in the case of the motor bus, much more has been done than in this country. The chief reasons are fourfold: The early advent abroad of smooth paving, the larger proportion of narrow and curved streets in the older city districts, the difficulty of securing right of way for tracks under British laws and the higher price of gasoline. Yet, in spite of these favorable conditions, the development in Europe has not been large, though with the increasing cost of gasoline the advantages of the trackless trolley become greater.

One of the largest trackless trolley installations in England is in Bradford, where both track and trackless electric operation are under one management, the municipality. For the fiscal year ended March 31, 1919, the Bradford Corporation Tramways earned a traffic revenue of £456,818 from the cars and of £15,121 from the trackless trolley buses. As to capital charges and operating expense, R. H. Wilkinson, general manager, made the following comparison before the 1919 Conference of the Municipal Tramways Association:

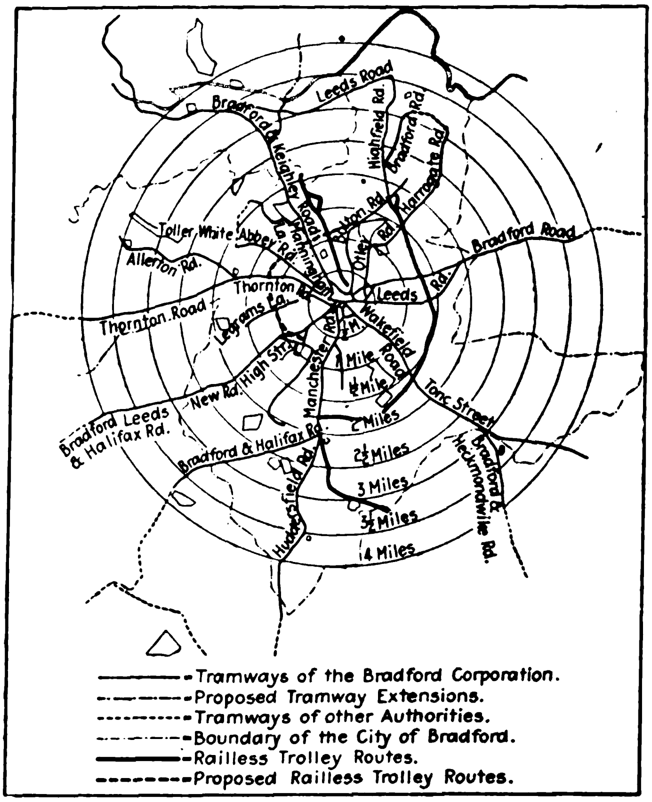
TABLE I—COMPARISON OF CAR AND TRACKLESS BUS ON VEHICLE-MILE BASIS IN PENCE PER MILE

Fixed charges......	2.675 for car and	1.50 for Bus or	43.9% less
Operating expense..	16.542 for car and	11.97 for Bus or	27.6% less
Total charges......	19.217 for car and	13.47 for Bus or	29.8% less
Comparison of Car and Trackless Bus per Passenger Carried in Pence per Mile			
Fixed charges	0.18 for car and	0.16 for bus or	11.0% less
Operating expense..	1.11 for car and	1.28 for bus or	16.4% more
Total charges......	1.29 for car and	1.44 for bus or	11.6% more

It will be apparent from Mr. Wilkinson's comparison that the superiority of the trolley car is due chiefly to its greater capacity. The present bus is a twenty-nine-seat single-decker weighing 5 long tons (11,200 lb.), which limitation is due to roadway rules. Mr. Wilkinson has lately designed a fifty-one-seater, including smoking compartment, for which he is seeking approval. Should the new design be acceptable to the authorities, he will have a bus approaching more nearly the capacity of his double-deck cars and perhaps less costly per passenger carried on the basis of overhead and operating costs combined.

Although only three trackless routes are shown on the accompanying map of Bradford as in operation, plans are in prospect for three more. The characteristics of present and future lines can readily be judged from the map as well as from the comparative revenues of tram and bus. One route (Frizinghall) starts from the city center at the Midland Railway station, sandwiched by two trolley lines for about one-half of its length of 2.6 miles. Its earnings were 10.6d. (21.2 cents) per mile. The second route (Okenshaw), 1.6 miles long, is obviously a suburban feeder which ties in with two trolley routes just 4 miles from the center of the city. This route earned 10.8d. (21.6 cents) per mile. The third route, 4.7 miles long, is a cross-town service which ties in with half a dozen radial trolley lines at points 1.5 to nearly 2 miles from the center of Bradford. This line earned 10.88d. (21.76 cents) per mile.

The three new lines would comprise a second cross-town line, a tie between two trolley terminals and an extension to an existing trolley line. From this, it is clear that the trackless trolley development at Bradford is along the lines to be expected in supplementing an existing tramway service with either the trackless trolley or the gasoline motor bus to take care of light-traffic routes. Although the Bradford Corporation Tramways operates gasoline motor trucks for municipal utility purposes, it has not acquired any gasoline passenger vehicles, perhaps because it has not arranged to serve conditions where the traffic routes might be subject to change.


Leeds Road
Bradford & Keighley Road
Highfield Rd.
Bradford Rd.
Harrogate Rd.
Toller White
Abbey Rd.
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Manningham
Bolton Rd.
Otley Rd.
Bradford Road
Allerton Rd.
Thornton Rd.
Leeds Rd.
Thornton Road
Legrams La.
Wakefield Road
M.
High St.
Manchester Rd.
1 Mile
1½ Mile
New Rd.
Tong Street
Bradford Leeds & Halifax Rd.
2 Miles
Bradford & Halifax Rd.
2½ Miles
Huddersfield Rd.
3 Miles
3½ Miles
4 Miles
Bradford & Heckmondwike Rd.
Tramways of the Bradford Corporation.
Proposed Tramway Extensions.
Tramways of other Authorities.
Boundary of the City of Bradford.
Railless Trolley Routes.
Proposed Railless Trolley Routes.

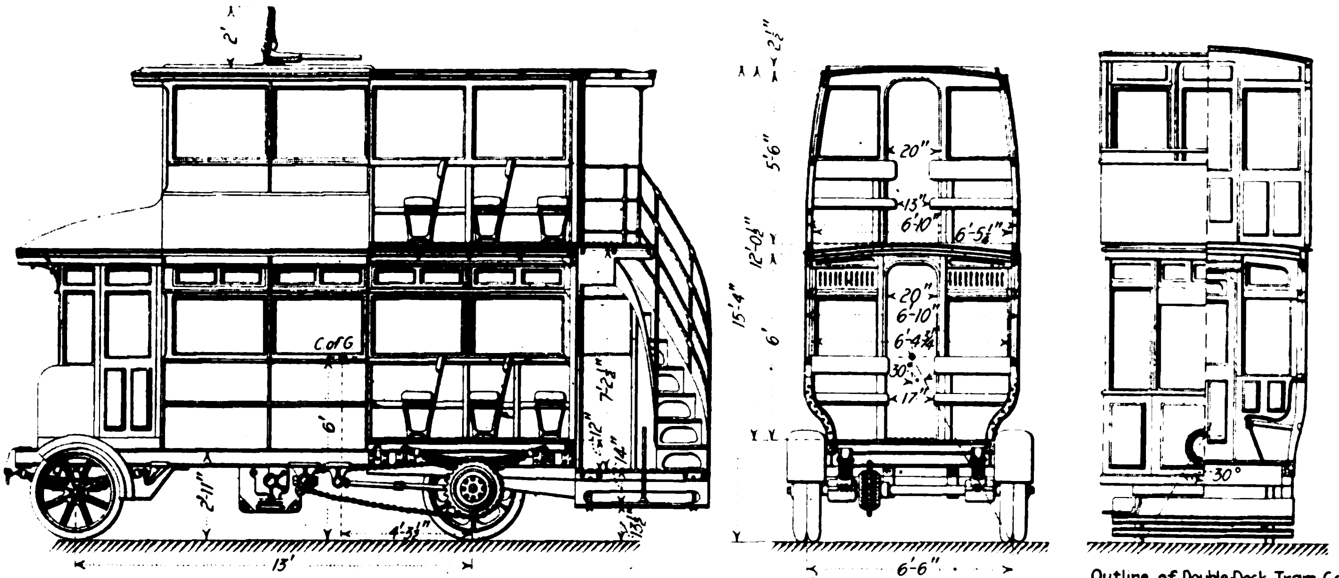
PRESENT AND PROPOSED TRAMWAY AND TRACKLESS TROLLEY LINES, BRADFORD, ENGLAND

Inasmuch as the gross earnings per car-mile were 22.257d. (44.514 cents), compared with less than half that figure on the trackless routes, we need not be astonished to find that the fares on the trackless trolley routes are somewhat higher, as indicated in the accompanying Table II.

TABLE II—COMPARISON OF CHARGES IN BRADFORD

Average Distance for Stated Fares on Car	Average Distance for Same Fare on Bus
1.66 miles workman's 1d. special-hour rate	1.55 miles
No 1d. fare	0.70 mile
1.66 miles regular 1.5d. fare	1.55 miles
2.48 miles regular 2.5d. fare	2.00 miles
3.52 miles regular 3.0d. fare	2.64 miles
4.14 miles regular 4.0d. fare	3.34 miles
5.09 miles regular 4.5d. fare	4.85 miles
6.96 miles regular 6.0d. fare	....

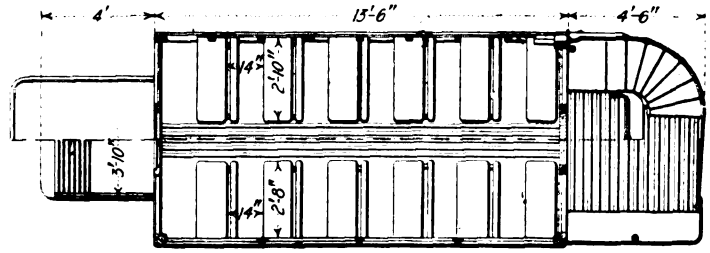
The average fare charged per mile on cars was 0.868d. (1.736 cents) and on the trackless trolley buses 1.078d. (2.156 cents). The figures of trackless trolley service by the Bradford Corporation Tramways are arranged in accordance with the standard system of accounting used by British municipal railways, so that comparisons with Bradford's cars can be made in a number of items showing the following:



Elevation

Cross Section

Outline of Double-Deck Tram Car, showing comparative Size



Half Longitudinal Section through Top and Bottom Saloons

DOUBLE-DECK TRACKLESS TROLLEY BUS IN EXPERIMENTAL SERVICE IN BRADFORD

On a vehicle basis, wages of platform men appear to be practically alike, the trackless bus averaging 4.415d. per mile against 4.312d. on the larger cars. Cleaning and oiling a trackless bus is apparently less costly per vehicle than a car, the relative figures being 0.399d. and 0.794d. Fire insurance is no greater than for the electric car, but the accident and compensation insurance item of 0.045d. per mile is double that for the car (0.233d), probably because any trackless vehicle is a bit of a vagabond.

The relative maintenance charges for the electrical equipment of line are 0.041d. for the trackless trolley and 0.267d. for the double-track car routes, a difference which can be ascribed to the fact that a trackless trolley requires a return circuit as well as a contact wire and some special features here and there. The trackless trolley, on the other hand, had to pay a road upkeep charge of only 0.374d. per vehicle-mile, whereas each car operated was assessed 1.289d. per car-mile for general repairs and maintenance of permanent way. In this last instance the trackless trolley has to pay approximately half as much per seat as the car.

From a vehicle maintenance standpoint, the car had the better of the comparison, averaging 2.678d. per mile against 3.201d. per mile against the newer and half as large trackless trolley bus. The energy consumption of the bus was 1.509 kw.-hr. per mile compared with 2.717 kw.-hr. for the bigger cars. Considering also that the trackless trolley buses must have averaged a smaller number of stops per mile and that they were not operated over the busiest and steepest streets, it is reasonable to assume that for Bradford paving conditions they would require almost twice as much energy per seat if single-deck bus remains pitted against double-deck car. This would not be true if double-deck trackless buses succeed. However, a comparison of the twenty-nine-seat bus at 1.509 kw.-hr. with a thirty-two-thirty-five-seat safety car averaging 1 kw.-hr. per mile indicates that a substantially higher energy consumption must be reckoned with on the part of a trackless trolley bus even though its weight per seat is below that of the lightest American trolley car.

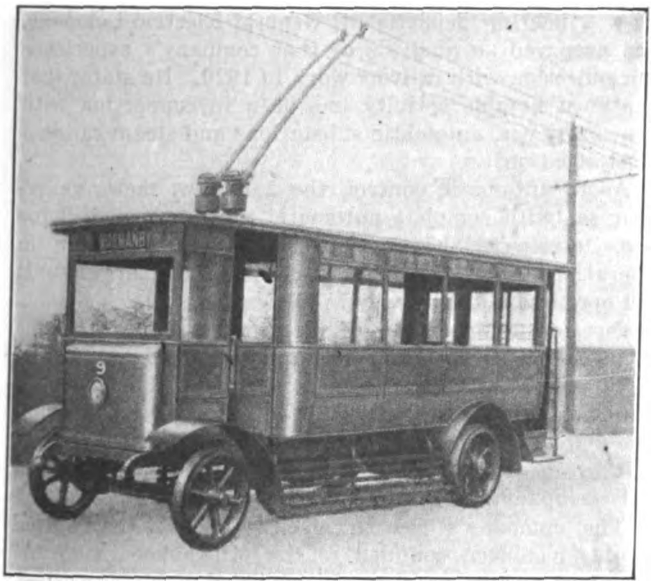
COST OF GASOLINE OPERATION HIGHER

Mr. Wilkinson's new double-deck trackless trolley bus is the first to be built of that type so far as is known. It is difficult, therefore, to make an exact comparison with the double-decker thirty-seven-seat gasoline bus as used extensively at Sheffield. However, the operating cost of the Sheffield bus averaged 17.896d. for the year ended March 31, 1919, compared with the 11.970d. operating cost of the twenty-nine-seat trackless trolley bus at Bradford as previously detailed. For the same period, the operating cost of the fifty-two buses at Birmingham averaged 18.944d. per bus-mile. The Edinburgh Corporation Tramways expect a thirty-two-seat single-deck bus to cost 20.75d. per mile, but this makes allowance for the higher wages that will prevail in 1920 as compared with 1918-1919. In any event, the extraordinarily high price of motor fuel in England (89 cents per gallon in March, 1920, and 1.10 cents in October, 1920) is putting the trackless trolley in a more advantageous position wherever there is enough traffic for something better than hourly or half hourly headways.

In the case of the 5.1-mile Tees-Side Rail-less Traction System, opened as recently as Nov. 8, 1919, the trackless trolley won out over the gasoline bus because of its lower power and upkeep costs, while it won out over the track trolley because the intended average headway of 15 minutes (30 to 7.5 minutes) did not warrant a construction cost of £12,500 to £15,000 per mile of single tangent track compared with the pre-war price of £4,500. This Tees-Side installation is worth mentioning because it is for conditions that in this country have hitherto led to the construction of highway trolley lines, necessarily of single-track construction and therefore none too adaptable to sudden accretions of traffic.

TRACKLESS TROLLEY COSTS HAVE RISEN LESS THAN BUS COSTS

Another British enthusiast for the trackless trolley is Harry Webber, general manager Keighley Corporation Tramways. On March 19, 1915, after five years of gasoline motor bus operation, he inaugurated a trackless trolley system comprising nine vehicles running over 8¾ miles of route in rather hilly country. At that time gasoline cost but 2d. per mile for a thirty-eight to forty-seat double-deck bus, while power for the twenty-eight-seat electric single-decker which replaced it cost one-half as much. An operation of 100,000 miles per annum was sufficient in power saving alone to cover interest and depreciation on the electrical overhead equipment. Owing to the uneven torque and the greater weight of the gasoline bus, the tire upkeep of the gasoline bus had cost practically four times as much as that of the electric bus, according to Mr. Webber.



A TYPICAL TRACKLESS TROLLEY BUS

Perhaps the most interesting fact is that although the electric buses were smaller, their greater cleanliness, smoother running and better lighting increased the passenger earnings from 24 cents to 28 cents per mile.

Trolley Freight Service Will Pay

Why It Can Successfully Compete with Steam Railroads and Motor Trucks—Practical Hints on Operation Are Given—Selection of Freight Manager Most Important Step

BY G. W. RAVERT
General Freight Agent Philadelphia Rapid Transit Company

THE emphasis placed upon the importance of the development of the electric street railway as a freight carrier, at the recent convention, should be very significant to all electric railway companies which are not operating a freight service. Pages and pages have been written on this subject, but its real importance, its financial possibilities and the principles underlying its management are not widely known and recognized. This is evident from the following quotation from the address of Mr. Graham, vice-president of the Pierce-Arrow Motor Car Company:

> In long-distance movements of heavy tonnage they [the electric railways] are surpassed by the steam roads; in short-distance transit of less than carload lots, up to 100 miles, they cannot compete with the motor trucks.

In short hauls up to 15 miles the electric street railway pays homage to and will gladly surrender such business to the motor truck, but in movements of heavy tonnage or less-than-carload lots, ranging from 20 to 200 miles, neither motor truck, steam road nor any other land carrier can successfully compete with the electric street railway from the standpoints of economy, reliability, dispatch and financial return.

The possibilities of the electric railway as a freight carrier are very great, yet it is a curious fact that this valuable form of transportation has hardly passed beyond the experimental stage. This condition is largely due to the shortage of managers capable of directing such traffic and the lack of competent counsel along freight lines, thus preventing the trolley freight from assuming its proper status. The general managers of the roads too often are completely absorbed in the passenger service, unconsciously letting a veritable gold mine lie unnoticed in their own back yards.

Most of the writers on this subject advocate the application of railroad principles. This was a good policy while the business was in its infancy, as every one realized the value of standardization, but now that the electric railway is emerging from the general class of freight carriers and stepping into a class by itself, it is absolutely natural and necessary that it should adopt methods and principles peculiar to its condition.

Economically, the advantages of the trolley freight service transcend those of the passenger service, yet it does not in any way interfere with such service. Financially, it is a better investment than the passenger service, for the reason that a carload of passengers represents from $5 to $10 in receipts, while a carload of freight, at a lower operating cost, represents from $50 to $75 in receipts. A striking example that the steam roads, old-time express companies and motor trucks are not considered successful competitors financially is shown by the fact that many large firms having their own motor trucks know from accurate cost records that it is cheaper to ship via trolley freight. The railroads are slower, express companies are more expensive and not so efficient, and the motor truck is essentially a fair-weather carrier and its rates are high. The trolley freight runs rain or shine, and, excepting in rare cases, all through the heavy winter storms, and delivers to more points convenient to consignees than any other carrier. In fact, its possibilities in this direction are unlimited. Ultimately goods will be delivered directly to the consignee's place of business.

NEEDS OF BUSINESS DESCRIBED

By far the most important first step in the promotion or expansion of the trolley freight is the selection of the freight manager. He should be a practical man, possessed of sound common sense and must be able to deal with men who work with their hands. He should be one who could go out and sell a service, not rates, as is the case with many freight-transportation companies. For example, a freight manager well known to the writer put forth the argument that trolley freight rates should be about 10 per cent lower than those of the steam roads in order to secure business. He also made a practice of encouraging his company to settle freight claims in favor of his shippers, as an inducement. This reminds one of the old-time cut-throat methods, and the disastrous effects it has on the business can be readily appreciated. In reality, the rates should be from 10 to 15 per cent higher than on the steam roads, in view of the more prompt and efficient service given, and all classes lower than fourth should be eliminated. Rules reducing the second and third-class rate should also be removed. This can be consistently done by taking an exception to the official classification, provided the business is based upon the rules and laws set forth by the steam road official classification.

An adequate terminal consisting of inbound and outbound platforms, together with a team yard, within easy reach of the big shippers, so built and located as to permit its keeping pace with the expansion of the business, is another prime essential. Two or three freight cars (according to local conditions) are all that are necessary at the start. These cars will pay out of their earnings for all additional equipment as it is needed by the ever-growing business. Here again, the manager proves a valuable asset. If he is not getting 100 per cent of use out of his equipment before shouting for more, he is wasting money.

It is advisable, of course, to use equipment especially adapted to freight traffic. Cars should be of modern type, built specially for interurban freight service and capable of hauling one or more trailers. Of course, many roads are operating with abandoned passenger cars, revamped, and are making money, but the time lost in the repair shop and the lower standard of efficiency cut their net profit considerably. Such cars are too small and ungainly, sacrificing strength for misplaced economy, and as they naturally are of all sizes and shapes, they do not permit a standardizing condition.

Reliable and adequate records are a strict essential in any business, but in the freight business they are a vital necessity. Probably most transit companies fail to realize the possibilities of the freight through their lack of reliable cost records. Briefly, the following outline covers most of the essentials and gives an accurate method of checking freight from the receivers into the freight cars. This plan cuts down claims to a negligible minimum and at the same time insures despatch.

A modern rating and billing system is of first importance, that is to say, each shipment must be covered by a waybill which should accompany the goods to its destination. Most roads have their bills made out by hand, using copying pencils and carbons, each biller rating his own bills. Many errors and subsequent loss of time and efficiency result from this practice. A special rate clerk doing rating exclusively can accomplish more work efficiently and accurately than by the former diffused method. At the inbound office, the procedure is somewhat similar. The goods should be checked from the cars against the bills received from the point of origin.

Aside from these salient points the rest of the office work can be governed by any modern standard method. It is of the utmost importance that proper cost records be kept and that a proper distribution of charges for maintenance and operation be made, in order that the freight is not charged with a host of unwarranted accruals.

These facts and suggestions are merely a few of the high lights in the proved advantages and possibilities of electric trolley freight, and, springing as they do from the comparatively short career of trolley freight, hold a promise of an unlimited future for this system of freight transportation.

Some Aspects of Electric Railway Progress in 1920

W. D. BEARCE, of the railway and traction engineering department, General Electric Company, has prepared an analysis of that company's experience in connection with railway work in 1920. He states that the most notable activity has been in connection with the safety car, automatic substations and steam railroad electrification.

As to automatic control, the 2,000-kw. motor-generator set with complete automatic control furnished for the Detroit River tunnel electrification has been in operation for several months. This is the largest unit yet operated automatically in railway service. A notable order for automatic equipment was that for eight 1,000-kw. control equipments and transformers for the 1,500-volt, direct-current substations of the Victorian Railways at Melbourne, Australia. In New Zealand the 300-kw. automatic substation ordered last year was put in operation on the Christ Church Tramways and this company has ordered two more.

The company's electrification work in the United States has been confined to the Milwaukee extension, for which five gearless locomotives were furnished. Outside of the United States work on the electrification of the Paulista Railway in Brazil and the electrification work for the Montreal Harbor Commission are well under way. In addition to the Paulista Railway electrification, another important project in South America is the equipping of the Santa Catharina lines in Brazil for 1,500-volt operation with multiple-unit cars. About 50 miles of these lines are being equipped for such service.

In a bulletin on automatic station control equipment recently issued by the General Electric Company, the following features of automatic stations are summarized: Minimum operating personnel required, better protection provided, maintenance cost reduced, distribution pressure improved, feeder loss decreased, standby loss decreased, electrolysis mitigated, insurance increased, reliability increased, development of small power sites made feasible.

The Bus and the Trolley

The Author Takes Issue with the Statement of the Motor Truck Manufacturer that the Electric Railways Cannot Hope to Compete with the Steam Railways and Motor Trucks in the Transportation of Freight—He Bases His Conclusions on the Situation in Southern California, Where the Conditions Are Most Favorable to the Operation of Motor Trucks

BY H. B. TITCOMB
Vice-President Pacific Electric Railway, Los Angeles, Cal.

I HAVE read the editorial in your issue of Nov. 6 under the caption "Shall We Turn the Freight Business Over to Motor Trucks?" as well as the statement of George M. Graham, vice-president of the Pierce-Arrow Motor Car Company, in his address before the American Electric Railway Association, that electric railways should not figure too hopefully on freight revenue, as they cannot successfully compete with steam railways and motor trucks.

To the Trade

WE are frequently requested by our customers to forward their orders by truck. It is immaterial to us how the goods go forward, as our responsibility ends when we get the carrier's receipt. There is, however, a condition surrounding truck shipments to which we wish to call your particular attention.

Since the beginning of the war, and the resultant delays in railroad freight deliveries, there have come into existence a multitude of trucks for freight haulage between interurban points. The people operating a great many of these trucks are absolutely irresponsible financially. Freight is intrusted to them without any guarantee whatever that it will ever be delivered at destination, or, if short, that any claim will be paid. A great many of these people have only a small equity in their trucks. If a serious shortage should occur it would be utterly impossible to collect the claim, owing to the carrier's lack of tangible assets.

In view of the above facts we wish to impress on our trade that we ship by truck only when so instructed by our customer, and that our responsibility ceases absolutely when we secure the carrier's receipt for the shipment in good order. When shortages occur we will not assume the claims for the customer. He must make his own settlement with the carrier.

This is no reflection whatever on the many reputable companies operating freight trucks, but is intended as a warning to protect both our customers and ourselves against loss through irresponsible carriers.

Be sure that your carrier is responsible before you intrust your goods to him.

—Notice which a Los Angeles heavy hardware concern sent out to its customers.

I most emphatically take issue with Mr. Graham's statement. If there is any place in the United States where conditions are favorable to the successful operation of motor trucks in competition with rail lines it is in southern California, where there are more miles of paved highways than there are in any other state in the Union with the possible exception of New York State.

Good roads are essential, and it is proper that they should be built, but it was never intended by the taxpayers of any state that these good roads should be turned over to any individual or group of individuals for private gain, yet the anti-corporation feeling of the public has been used as a cloak to build up under this subsidy plan a competitive system that is not just and is out of line with the American spirit of fair play. Every industry, every public utility and every form of business must be remunerative within itself; otherwise it should not exist. Any such facility that cannot be made self-sustaining must not, under any stretch of the imagination, be subsidized out of general taxation. Such socialistic tendencies are not in line with the American spirit and should not be tolerated by the American people.

WHY BUS DEVELOPMENT HAS TAKEN PLACE

Mr. Graham also says: "The motor bus can never eliminate the trolley." With this I agree, but I cannot agree with his further statement that "the public is eager to use the bus." The American public has come to use buses simply for two reasons: (1) Prejudice against corporations in general and the railroad corporations in particular, and (2) the inability of some railroads to give service to developing communities.

As to the first reason, the experience of the traveling public with the corporations that control the motor bus lines has been to show that after all the rail line corporations were not as grasping and as dictatorial as had been pictured.

As to the second reason, financial difficulties have been responsible for lack of development on the part of electric railway transportation companies. The people have had an idea that the coffers of these companies were of unfathomable depth and that money could always be obtained for the development of railroad facilities. Pyramided prices of labor and materials and reluctance on the part of politicians and soap box orators to recognize the necessity for higher fares have in many cases kept conscientious railroad commissions from doing the fair and reasonable thing that justice demanded. In other words, the general thought seems to have been that if these corporations were impoverished they could give better service. But the effect of this policy has simply been to drive money into more remunerative lines. To a great extent, however, this is being overcome. I believe I am not too optimistic in saying that the pendulum is swinging back, and I believe there is a bright future for the electric transportation concerns of the country.

The motor bus will not become a thing of the past. It is performing a service that is necessary in many cases, but it cannot supplant the electric or steam lines. It can be made an adjunct to such lines on a businesslike and remunerative basis. The railroads can no longer play the "dog in the manger," and where communities develop and warrant the establishment of service, these transportation companies must extend their rail lines or put in feeders that will reach the nearest point of existing rail transportation and, by a system of through fares and tickets, give the people dependable and positive service that can be properly regulated by governing bodies. This can be accomplished by contracts with bus concerns or the formation of bus corporations to operate in conjunction with existing transportation lines.

The Pacific Electric Railway started handling freight in a small way more as an accommodation to its patrons than with any idea that the business would prove remunerative, but as conditions changed and the public became acquainted with the service we were able to render the demand for it became more general and our freight revenue has shown a steady increase.

The Pacific Electric system radiates from Los Angeles, the longest interurban line being approximately 70 miles. We have a roadway mileage of 615, but, as there are certain points where our old franchises did not contemplate the handling of freight, we have a freight road mileage of 519, and we find that the revenue derived from the transportation of freight today is equal to approximately 24 per cent of our total revenue.

WHAT RAILWAYS AND BUSES PAY FOR ROADWAY

The Pacific Electric Railway is typical of the better class of interurban railroads of the United States. It has come out of the war period with its tracks, its equipment and its service in better shape than any other interurban railroad, barring none. We have the highest skill that can be obtained in railroad management, and our operating personnel, from the section foremen through the train service and all departments, is of high class, with good esprit de corps, better feeling and higher efficiency than any similar transportation company in the country. But this has been accomplished by the optimism of the financial backers of this splendid property. Through this war period and through the competitive period brought about by the advent of the automobile they have stood by this property, knowing that it would ultimately realize the dreams of its founders, although there is an accumulated deficit of upward of $11,000,000 loaned to this company to tide it over. The public should know and should appreciate this in order that it may bear with us in the readjustment that is necessary to "get on our feet" again.

Our property is worth far in excess of the $70,000,000 on which we are trying to pay interest. The following figures may be of interest:

FINANCIAL REPORT OF PACIFIC ELECTRIC RAILWAY, FOR TEN MONTHS ENDED OCT. 31, 1920

Gross operating income		$12,630,000
Operating expense:		
Way and structures	$1,241,000	or 9.1 per cent of gross income
Equipment	1,596,000	or 12.6 per cent of gross income
Power	1,430,000	of 11.3 per cent of gross income
Conducting transportation	3,783,000	or 29.9 per cent of gross income
Traffic	133,000	or 1.0 per cent of gross income
Auditing expense, store, supplies, damages, etc	1,046,000	or 8.2 per cent of gross income
Summary:		
Wages	$6,205,000	or 48.0 per cent of gross income
Material charges	3,024,000	or 23.9 per cent of gross income
Depreciation and taxes	742,000	or 5.9 per cent of gross income
Interest on bonds and borrowed money, and other miscellaneius deductions	3,487,000	or 27.5 per cent of gross income

These figures show that maintenance of way of our tracks, bridges, private rights-of-way, etc., eliminating all rolling equipment, building, stations, power stations, overhead equipment, trestles, etc., is $958,000. This is 7.5 per cent of the gross income. Our state taxes are 5.25 per cent of our gross income.

We have invested approximately $45,000,000 in private rights-of-way, paving, bridges, trestles, culverts, switches, ballast, fences, etc., not including rolling stock, buildings of all description, electrical equipment of all description, etc. Six per cent on this amount is $2,700,000 and on the basis of a $15,000,000 income this sum would represent 18 per cent of our gross income. If to this percentage the percentage for maintenance, 7.5 per cent, and for taxes, 5.25 per cent, is added, a total of 30.75 per cent of the gross income is required to furnish a roadway on which to operate.

As against this we know that the ordinary auto truck or interurban bus must do upward of $30 a day in business, or $10,000 annually, or it cannot operate and live. We further know that the personal property tax on each of these buses, its license and the percentage of any gross that may be turned over to the state does not total more than 3 per cent, or $300 a year.

This leaves a difference of 27.75 per cent, which is the subsidy that is being given these trucks that are using our highways for profit and destroying the value of the electric and steam railroads of this country. It is no wonder they can make the short hauls and deliver from business house to business house more cheaply than the freight can be handled by a rail line. But the answer is that it cannot be done if no subsidy of the extent indicated is paid.

Since May 1, 1917, a California statute has required new truck lines to secure a certificate of public convenience and necessity from the State Railroad Commission before service can be established, and at the present time there are operating in competition with the Pacific Electric Railway thirty-five common carriers by truck, operating 130 trucks and trailers. We estimate the revenue they deflect from this company approximates $300,000 per year. There are also numerous "contract" carriers which are not required to file their rate schedules with the commission and we estimate that they deflect an additional $100,000 per year.

As I have already said, the taxpayers did not contemplate that $40,000,000 of the state's money should be put into roads for the pecuniary benefit of individuals or for those who use such investment for their private gain, with the resultant destruction of our highways.

Our State Highway Commission is greatly alarmed at the deterioration of these splendid highways. Our cities are demanding that the damage done to the streets and highways within their limits be maintained out of the fund accumulated through the automobile licenses. Our state officers are greatly perturbed over the lack of revenue that should come to the state from the gross income that should be earned by the rail corporations. Millions of dollars would pour into the state treasury were it possible to tax these automobiles 5¼ per cent of their gross revenue and let it go to the state, as exacted from the rail lines. Some system to accomplish this must be devised.

LEGISLATION RECOMMENDED

Summarizing, we do not ask for anything unreasonable, but we do say:

1. We advocate the repeal of Section 498 of the California Civil Code, which relates to the paving of portions of street occupied by tracks, which would leave

the question of paving to municipalities and the electric railways operating therein. It goes without saying that the day when these rail transportation companies should maintain their paving is past.

2. We feel that an indeterminate franchise act which would repeal the existing cumbersome statutes should be passed by our state legislature. This would lend financial stability to the companies and allow them to proceed with improvements that otherwise will not be undertaken where the conditions of succeeding franchises may be so exacting as not to warrant the expenditure of large sums.

3. We want a fair and reasonable tax on automobile carriers using the highways for commercial purposes, also an amount which would be equivalent to the percentage of gross receipts paid by the rail carriers.

4. The jitney law should be amended so that it will require jitney operators to obtain permits from local authorities before applying to the Railroad Commission for a certificate of necessity and convenience.

5. "Contract" carriers should be placed under the jurisdiction of the Railroad Commission, and all automobile cariers should be required to make full and complete reports of their operations to the commission, as is done by the railroad companies.

6. Urban auto carriers should come under the jurisdiction of the State Railroad Commission, particularly where they operate in competition with interurban systems of transportation.

MOTOR TRUCKS SUITABLE ONLY AS FEEDERS

I do not share the views of the Graham reference to the relative merits of the bus and the electric railway for freight haulage. The electric railway does, and will continue to, handle the bulk of short-haul freight movement. The future will see trucks as feeders to haul freight to central points, thence to be transported to cities by trolley or steam lines. The cost of unloading from trucks and loading onto the trolley freight car, etc., will be more than offset by the higher operating cost per ton-mile of such auto trucks, if we add to the present high operating cost of such trucks approximately 25 per cent, which is a just amount as taxes and interest on investment in the roads that they are destroying. This at first glance may seem large, but if any stretch of the state highways, which have cost as high as $20,000 a mile, is examined and note is made of the destruction, as well as of the comparatively small amount of auto travel which they have carried, it will not be far wrong to say that the damage to these roads will probably reach the astounding figure of one cent a ton-mile.

Mr. Graham would lead us to believe that for such factories, farms, mills, stores and warehouses as are located directly along the lines of rail transportation the railway companies handle only a very small amount of the total freight moved. If he had collected a few statistics he would have found that the great movement of freight goes to and from the great wholesale business houses and factories that have necessarily located on the lines of these transportation companies simply as a matter of economy and business prudence in providing facilities that will give them the quickest, most dependable and most economical method of doing business.

The haulage of freight has become a very great revenue producer for the Pacific Electric and other railroads and will grow, provided the trucks are obliged to charge for their service in proportion to their costs and the damage they do to public property.

SAN PEDRO-LOS ANGELES SERVICE MOSTLY ELECTRIC

Eighty-five per cent of the freight moved from Los Angeles Harbor to Los Angeles is done by the electric line and not by truck, as many seem to believe. The present highway is not congested; it could take four times the truck business it now handles, but the shipping public knows that the facilities cannot be provided alongside a ship that would adequately take care of the great strings of auto trucks that would be required to handle the freight carried by one of the large ocean-going vessels that dock at our far famed harbor.

I firmly believe that freight haulage is a big problem for the electric railroads. Profits of business houses are made by the volume that they handle, and large volume can be handled only in large units. Where the average car can handle 25 to 30 tons of merchandise and 50 to 55 tons of grain in a unit, it is hard to conceive of motor trucks supplanting them. We also know that every first-class and far-seeing business concern is locating its facilities, especially at wholesale points, along railroad lines and building its warehouses and supply depots at such points as can economically handle this volume of traffic.

It is a common daily occurrence on the Pacific Electric Railway to move 100 cars of freight from San Pedro with about 25 tons to the car, or a total of 2,500 tons. If this business was done instead by motor trucks with from 3 to 5 tons capacity, or an average of 4 tons, 600 automobiles would be required to take care of one day's business and operating in but one direction. Such an idea is preposterous. It will never be done.

An interesting side-light on this situation is thrown by the notice, which is reproduced on page 81. This notice was sent to all of its customers by a Los Angeles heavy hardware concern and is of interest.

Austria Planning Electric Railways

NEWS has recently reached this country that the plans for the electrification of about half the railway lines in Austria have been approved. The project covers approximately 400 miles of railway, mostly in mountainous country, and will cost about 5,000,000,000 crowns. The reason for the sudden undertaking of the work projected more than twenty years ago was the breaking up of the old Austria, which was comparatively rich in coal. The present Austria finds itself almost without coal. To reduce its dependence on outside countries for coal, the development of potential water power and railway electrification offer the only solution.

A conservative estimate places the saving through the employment of electricity at 7 per cent of the total outlay, because much equipment for hauling the coal from the Czech frontier 420 miles to the Austrian Alpine roads will no longer be necessary. The development of about 76,000 hp. of water power will be required for the first undertaking of 400 miles of line. Later it is proposed to electrify an additional 680 miles of lines, which will necessitate other developments totaling approximately 150,000 hydraulic horsepower.

Getting the Best Results with Steel Poles

Manufacturer Makes Suggestions to Users Which Show How Special Requirements Sometimes Cause Unnecessarily High Cost—Some Practical Hints on Pole Testing Are Also Given

IT IS highly desirable that the users of a manufactured product appreciate fully the relation of manufacturing processes and characteristic qualities of materials to the finished article which they procure from the manufacturer. To this end such publications as the issue of the " 'National' Bulletin," of the National Tube Company, dated 1921, is very useful. A few suggestions from this bulletin are given below.

This company has developed a grade of mild steel that has proved in service especially adapted to the manufacture of welded tubular holes. The average composition of this bessemer steel is carbon 0.07 per cent, manganese 0.35 per cent, sulphur 0.045 per cent, phosphorus 0.1 per cent. The variations permitted are: Not more than 0.09 per cent carbon, 0.065 per cent sulphur, 0.11 per cent phosphorus; while for the manganese the range is from 0.3 to 0.6 per cent.

REGARDING POLE TESTING

The company states that while something may be gained from any test that will show the ultimate strength of a pole, some tests, such for example as the deflection test, are practically useless. Users sometimes claim that flexibility is of advantage in practice, although the specifications contain a clause limiting the deflection of the steel poles to less than is permitted for other materials. In any event the deflection can be calculated with great accuracy.

In contrast with the doubtful usefulness of the deflection test is the effective drop test, which determines whether the joints have been properly and securely assembled. Sectional poles are usually dropped, butt down, three times from a height of 6 ft., on a solid hardwood block supported by a rigid base.

Another practical test is the pulling or pushing test applied in the direction of the pole length. In this test short-jointed sections on several poles are cut out and tried in a testing machine. Tests have shown that many joints will carry, without slipping, substantially a push or pull nearly equal to the load the smaller pipe in itself would withstand.

The steel used for National poles has a minimum elastic limit of 30,000 lb. and the test for yield point is carried out at 10 per cent below that value. The set under this load is measured. Another and quite common flexural test is made when poles are inspected. It is carried out after the manner usually employed in determining the elastic modulus of the material. In this test both load and the corresponding flexure (or deflection) are recorded. It is usually made at the rather high stress of 18,000 lb. per square inch. This is two-thirds of the stress which is used for maximum load.

ALL POLES SHOULD NOT TAKE SAME SET

Many specifications have been drawn up requiring poles of widely differing lengths and diameters to stand the same deflection, commonly 6 in. Now, a pole 22 ft. long made of 13-in. and 12-in. pipe should not be deflected more than about 1 in., while a pole 39 ft. long of 4-in., 3-in. and 2½-in. pipe should be deflected about 18 in. when tested for deflection. It is evident that a constant figure like 6 in. for deflection may be much too large in one case and too small in another. A deflection of 6 in. is about right for a pole 31 ft. long, of 6-in., 5-in. and 4-in. pipe.

Some framers of specifications have attempted to overcome the difficulty by reducing the limit of deflection to 3 in. and some to 1½ in. Against such practice it is proper to urge that 1½ in. would not strain a pole 39 ft. long, of 4-in., 3-in. and 2½-in. pipe sufficiently for the test to give any indication of the quality of the pole. It is more rational to use such load as will produce about a constant stress in the material and then to fix the deflection limit to correspond.

Tubular steel poles are designed for a certain maximum load which may be applied without producing appreciable permanent distortion. The load to be applied should not produce a fiber stress above the yield point, say not over 90 per cent of that for safety. After such loads are applied there usually remains a small fraction as a permanent set, which some specifications have limited to a constant figure, such as 1 in. or ½ in. This constant figure is as inappropriate for set as a constant figure is inappropriate for deflection.

Tests have shown that the set on first loading seldom reaches 10 per cent of the distortion produced by that load. The practical difficulties of making the tests and measures impose a limit to such measures, which for commercial testing of poles is usually agreed on as ½ in. of permanent set. Thus a pole which is deflected 5 in. on test should not show a permanent set exceeding ½ in., but a pole that is deflected 15 in. on test may show a set of 1½ in. without exceeding rational limits.

The length of the sections of a pole has but little effect on strength, stiffness or weight. As long as the size and thickness of pipe remain unchanged, the strength, stiffness and weight do not change by more than approximately 6 per cent.

SPECIAL MANUFACTURING PROCESSES INCREASE COST

The use of odd sizes, thicknesses and weights should be avoided as it involves special production, delay and increased cost. Considerations of strength, stiffness, etc., at times suggest the advisability of such combinations as 4½-in. in 5-in. pipe, but such combinations necessitate assembling in a machine capable of forcing the smaller into the larger pipe. A forcing machine of this kind is expensive to change and such joints should be used only where it will be possible to order a large number of poles identical in dimensions, unless the use warrants paying the extra assembling costs when only a few are made at one time.

When only a few poles are ordered, it is better to use such sizes and thicknesses as will allow the insertion of the smaller pipe to be made by hand, say at least ¼ in. difference in diameter between the outside diameter of the inserted pipe and the inside diameter of the larger pipe. The difference should never be less than $\frac{1}{16}$ in. unless the quantity justifies the use of the forcing equipment, say when 1,000 or more identical poles are to be made and shipped at one time.

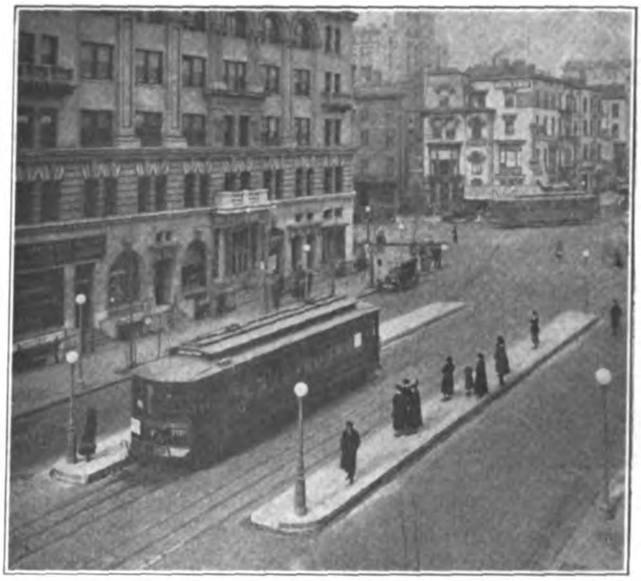
Sometimes considerations of strength, stiffness and limit of least thickness lead to the choice of sizes of pipe that entail great reductions at the joints. These require heavy swaging before assembling. After the poles are assembled, there is great risk of injury to the smaller sections in transit or erection. It is frequently possible to obtain an equal or even a slightly greater strength by the use of larger and thinner pipe for the upper section, and to do this without increasing the total weight appreciably.

To protect the poles near the ground line where deterioration is most rapid, a dog guard may be applied. This is made of a piece of larger and thicker pipe put over the pole from the butt end and swaged and shrunk on so that one-third of the length will be below and two-thirds above the ground line. These guards are applied at red heat. While cooling they shrink tightly. They at least double the life of a pole of extra-heavy type and frequently triple the life of a pole of standard type. Dog guards are usually made 2 ft. long.

Permanent Loading Platforms in Washington

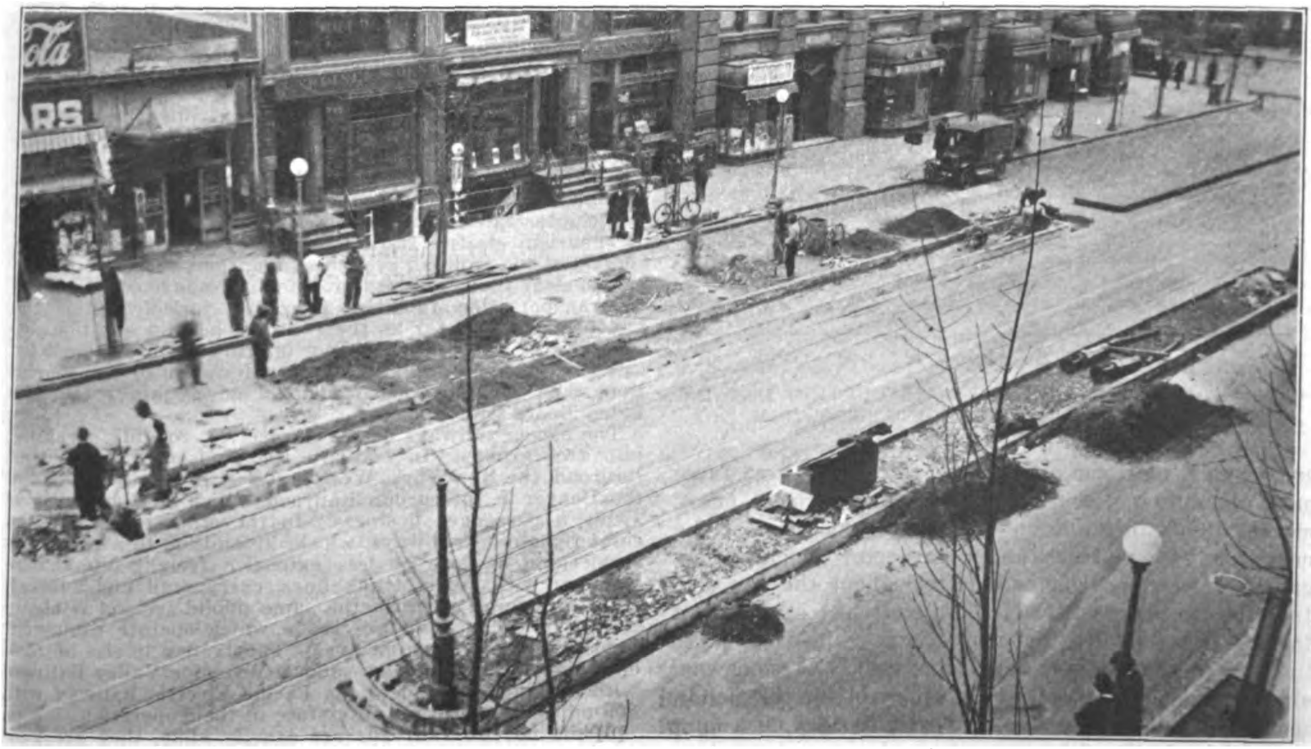
Wooden Structures, Which Have Proved the Usefulness of Loading Platforms in Congested District, Being Replaced by Permanent Type—Construction Conforms to Street Paving

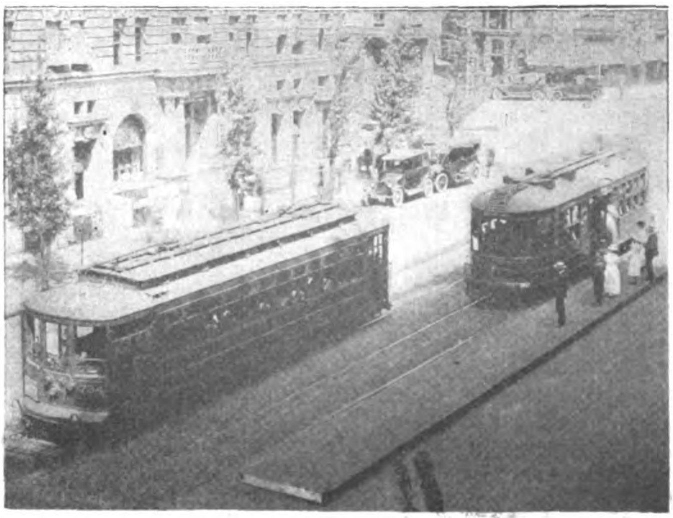
THE highway authorities in the District of Columbia have begun conversion of the wooden loading platforms used for the past two years to a permanent concrete form. The loading platforms in Washington, which were installed in 1918, following the recommendations of John A. Beeler, have given excellent satisfaction from a traffic standpoint. A description of these platforms, with illustrations, was given in the ELECTRIC RAILWAY JOURNAL, May 4, 1918, pages 848 and 849. At the same time an analysis of the skip-stop or rearranged stops in the downtown districts was given. On July 13, 1918, page 64, was given an account of the results obtained in the way of speeding up traffic following the installation of these loading platforms.


COMPLETED LOADING PLATFORM ON FOURTEENTH STREET, SHOWING LIGHTING STANDARDS SIMILAR TO STREET LIGHTING UNITS

The principle of the loading platform has now become so firmly established as a part of Washington practice that the highway authorities have decided to eliminate the wooden platforms and install a more artistic and permanent form. The first pair of platforms converted are about 6 ft. x 96 ft. over all. They are built with a 6 in. x 20 in. granite curb set in the asphalt pavement in the form shown in the diagram. Within the curb a cinder fill is rolled directly on top of the old asphalt and this is topped with about 2½ to 3 in. of surface asphalting similar to the standard paving material used in the District of Columbia.

The lighting of each platform is by two pedestal lamps surmounted by standard series lighting unit and

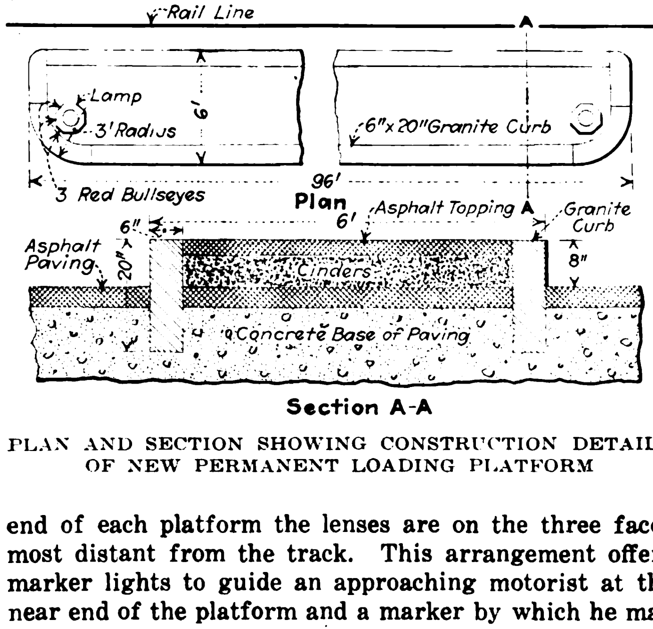

LOADING PLATFORM UNDER CONSTRUCTION, SHOWING RETAINING CURB READY FOR FILL



STYLE OF WOODEN PLATFORM ORIGINALLY INSTALLED IN 1918, NOW BEING REPLACED BY CONCRETE PLATFORMS

with a special low-voltage lamp to light the red bullseyes in the base. The three bullseyes in the base of the lamp are lighted by a single lamp centered on the axis of the post supplied with current at low voltage from the lighting circuit of the nearby alley. It was considered dangerous to have this lower lamp one of the high-voltage series lights similar to that used on the top of the post and for the regular street lighting units. It was argued that the bullseyes might become broken and some one poke in through the open bullseye with an umbrella or metal rod and break the high-voltage series lamp, with possibly serious results to himself through electrical shock.

The base of the lighting unit is a standard octagonal post with red bullseye lenses on three of the eight faces. At the end nearest to approaching traffic the lenses are on three faces toward approaching traffic. On the far end of each platform the lenses are on the three faces most distant from the track. This arrangement offers marker lights to guide an approaching motorist at the near end of the platform and a marker by which he may gage a turn if he wishes to circle about the far end. In other words, as Mr. Hadley, electrical engineer of the district, puts it, "the motorist is guided by a red light from any angle of legal approach." A somewhat similar problem was solved elsewhere in the district by using red bullseyes in five of the eight sides on a lamp on an island of safety at an irregular crossing where numerous possible angles of approach had to be guarded.



PLAN AND SECTION SHOWING CONSTRUCTION DETAILS OF NEW PERMANENT LOADING PLATFORM

The material improvement in appearance of the loading platforms as compared with the old wooden structures is obvious from the two illustrations showing conditions before and after conversion.

What Is an Interurban?

The United States Railroad Labor Board Sets Forth Its Characteristics in Lengthy Decision—Board Rules Adversely on Point of Jurisdiction in View of These Characteristics

A SHORT reference to the decision of the United States Railroad Labor Board handed down on Dec. 18 discussing the meaning of the term "interurban" as contained in Section 300 of the transportation act of 1920 was published on page 1297 of the issue of this paper for Dec. 25. The full text of the decision shows that the board made an interesting analysis of what characterizes an interurban railway before rendering its opinion. The case came before it through appeals from employees on various electric railways asking the board to hear their grievances. The petitioners represented sixteen unions in all and the respondents were the following eleven railways:

Spokane & Eastern Railway & Power Company (Inland Empire Railroad), Inter Urban Railway, Fort Dodge, Des Moines & Southern Railroad, Piedmont & Northern Railway, Lackawanna & Wyoming Valley Railroad, Pacific Electric Railway, Denver & Interurban Railroad, Hudson & Manhattan Railroad, Chicago, Lake Shore & South Bend Railway, New York, Westchester & Boston Railway and Washington & Old Dominion Railway.

In reciting the reasons for the case before it the board said:

> Representatives of employees on the electric railways named herein have brought before the Labor Board for consideration and determination disputes between these railways and certain of their employees. All the organizations which are petitioners do not have a dispute with every respondent railway, but each petitioner has a dispute with one or more of the respondents and each respondent has a dispute with one or more of the petitioners. The railway representatives having questioned the Labor Board's jurisdiction, this decision is upon that question solely.
>
> The ground upon which jurisdiction is questioned is that these railways are interurban electric railways not operating as a part of a general steam railroad system of transportation, and that they are therefore excepted from Section 300 of the transportation act, 1920, Sub-section 1 of which is as follows:
>
> "1. The term 'carrier' includes any express company, sleeping car company, and any carrier by railroad, subject to the interstate commerce act, except a street, interurban or suburban electric railway not operating as a part of a general steam railroad system of transportation."
>
> It is clear that Congress intended to exclude certain kinds of transportation facilities from the jurisdiction of the Labor Board. So far as the railways here in question are concerned, if they either are not interurbans or are operated as a part of a general steam railroad system of transportation, then they are not excluded and remain within the Labor Board's jurisdiction.
>
> The eleven railways divide themselves, roughly speaking, into two groups. In one are the Hudson & Manhattan Railroad, the New York, Westchester & Boston Railway and the Denver & Interurban Railroad, which do almost exclusively a passenger business. In the other group are the eight remaining railways, which, in addition to a passenger service, do a more or less extensive freight interchange business with steam trunk lines, carry mail and express, and, in general, perform the same public service as steam lines. In each group are roads which operate equipment jointly with steam trunk lines. They range in size of road operation from the Lackawanna & Wyoming Valley Railroad with 20 miles of road to the Pacific Electric Railway with 600 miles. Several are interstate in their operation.
>
> While no two railroads are exactly alike, they are generally similar as to method of operation and character of

employment, except for the Hudson & Manhattan Railroad, whose equipment and operation are similar to that of the Interborough and the Brooklyn Rapid Transit Companies of New York. There are also certain other features characterizing one or more of the railways which, being emphasized by the petitioners to prove that particular railways are within the jurisdiction of the Labor Board, deserve careful consideration. Such consideration will obviate the necessity of presenting in detail the facts about each railway. The points to consider are as follows:

1. That this or that railway is physically an interstate property.
2. That it performs the principal functions of a steam railroad.
3. That its charter permits it to operate either by steam or by electricity.
4. That it has at some time in the past operated by steam.
5. That to a certain extent it operates jointly with a steam trunk line certain equipment and makes certain joint use of track.
6. That its stock is entirely or partially owned by a steam trunk line.
7. That it does a considerable interstate business.
8. That it has received a freight increase from the Interstate Commerce Commission under ex parte 74.

The board then considered these points seriatim, after noting that none of the correspondents is under the same operating management as any general steam railroad system, and that certain court decisions had already declared that the Spokane & Inland Empire Railroad and the Fort Dodge, Des Moines & Southern Railroad were "interurban" roads. This analysis of the eight points showed that none of them was controlling in deciding that a road was not an "interurban" railway. In connection with points 5, 6 and 7, the board also declared its understanding of the words in Section 300 "a part of a general steam railroad system of transportation." This phrase means, it says, operating as an integral part of such a system and under unified control. If there is a physical connection and a common control and the lines are used together as one general system the act would cover and include such a road. But when there is separate control and management, mere contiguity at points of connection or even some common officials would not be a decisive test. If the road is under such separate control that its officials can manage its own business, make its own contracts and regulate its own affairs it is not a part of another.

WAYS IN WHICH ELECTRIC RAILWAYS ARE EXCLUDED FROM ACT

The board points out that interurban electric railways are excluded from the provisions of the transportation act under three heads, namely:

(a) In all matters pertaining to federal control, namely, Section 204-A, "reimbursement for deficits," and Section 209-A, "guarantee to carriers," the exclusion covers an "interurban electric railway which has as its principal source of operating revenue urban, suburban or interurban passenger traffic, or sale of power, heat and light, or both."

(b) In Section 1, Sub-section 22, forbidding extension and further construction without authority from the Interstate Commerce Commission; in Section 20-A, requiring the assent of the Interstate Commerce Commission to the issuance of securities, and in Section 300, giving the Labor Board jurisdiction, the exception is "a street, interurban or suburban electric railway not operating as a part of a general steam railroad system of transportation."

(c) In Section 15-A, dealing with rates, are excluded "interurban electric railways, unless operated as a part of a general steam railroad system of transportation or engaged in the general transportation of freight."

The phraseology used in these paragraphs, the opinion points out, differs to some extent, but the same language is used in Section 20-A and in Section 300, and the board points out that under Section 20-A the Interstate Commerce Commission has not felt itself warranted in assuming jurisdiction over the issuance of securities by interurban roads, including some of those concerned with the present case. The board also points out, as a practical matter, that the granting by the Labor Board of a wage increase without corresponding authority to the Interstate Commerce Commission to raise rates would result in serious complications, that the Labor Board and the Interstate Commerce Commission were clearly intended to be interdependent in this matter and that such intention would be nullified if the Labor Board assumed jurisdiction where the Interstate Commerce Commission was without it.

In conclusion, the board, in declaring that it has no jurisdiction over the respondents, says:

> It is plain that Congress has dealt in discriminating language with interurban electric railways throughout the interstate commerce act and the transportation act, 1920, and has consistently treated them differently from steam lines. Congress has done this because there is a material difference, generally speaking, between steam and electric roads in the matter of equipment, nature of service and standards of employment. With a few exceptions, one service is general, the other is local. The difficulty is that a few electric railways have developed far beyond the original idea of an interurban. They have now come to rival many steam lines in service and size. And still the definition of what is an interurban has likewise broadened, not only by popular conception, but by legal, statutory and executive decree, so that the Pacific Electric Railway, operating upward of 600 miles of road; the Fort Dodge, Des Moines & Southern Railroad, owning 2,400 box and coal cars, and the Spokane & Inland Empire Railroad, crossing state lines and operating passenger and freight trains, are all judicially labeled "interurban." It is difficult, if not impossible, to get away from this definition.

Vibration Due to Electric Locomotive Side Rods

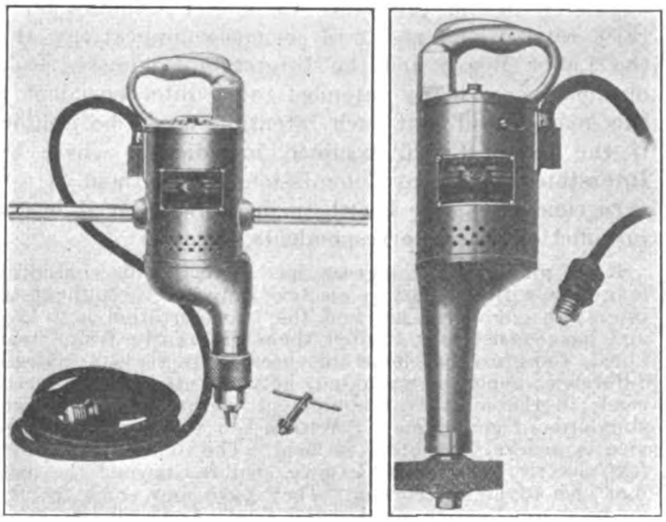
IN AN article in *le Génie Civil* for Dec. 11, 1920, attention is directed to the critical velocity of locomotives of the side-rod type. While the importance of the development of the gearless drive is recognized in the article, the fact is pointed out that for some time to come the greater number of locomotives equipped with one or two large motors coupled by means of cranks and connecting rods with the driving axles must be reckoned with. Examples of this drive are found in the Simplon, the Loetschberg and the St. Gotthard locomotives.

There is for each locomotive a critical speed at which injurious vibrations will be set up, and this is calculable from the mechanics of the oscillating parts. This article gives the method of analysis used by W. Kummer and the results of experiments made by K. E. Müller.

From the experiments made it appears that resonance (the condition for the occurrence of vibration) developed in the following locomotives at the respective speeds given: Valtellina, type 38 of 1906, 40 m.p.h.; Milan-Varese, type 1-C-1 of 1912, 48½ m.p.h.; Loetschberg, type 1-E-1 of 1913, 25½ m.p.h.; Silesia, type 2-D-1 of 1917, 25 m.p.h. When vibration actually occurred on these locomotives conditions were changed so as to eliminate it.

New Line of Electric Drills and Grinders

THE Wodack Electric Tool Corporation of Chicago, Ill., is manufacturing a new line of electric drills, hammers and grinders. Its portable drill is motor driven, using either alternating or direct current, which is automatically shut off when not in use. This is brought about by the use of current contacts actuated through a spring lever in the handle, which is released as soon as the pressure of the operator's grip is removed, much in the same manner as with the dead man's handle used with railway controllers. Wodack drills are made in six sizes, $\frac{3}{16}$ in., $\frac{5}{16}$ in., $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{5}{8}$ in. and $\frac{3}{4}$ in.



PORTABLE ELECTRIC DRILL AND GRINDER

In addition to drills the company is manufacturing a portable grinder equipped with the same style of current control. These grinders are made in three sizes depending on the wheel capacity: 3 in. x $\frac{1}{2}$ in; 4 in. x 1 in., and 8 in. x 1 in. The motors used with both types of tools are made of high grade aluminum and are equipped with SKF ball bearings throughout. The manufacturers claim to have developed a very rugged motor which will stand severe overloading and their guarantee includes repairs and rewinding of motors free of charge should they burn out for any reason within one year from the date of purchase.

Gasoline Substitute for Motor Vehicles

IN A RECENT issue of *Engineering*, London, G. J. Shave gives the results of experiments on omnibuses carried out by the London General Omnibus Company, Ltd., using benzole-alcohol for fuel. The purpose of these tests, he states, was to find a suitable substitute for gasoline. Benzole and gasoline contain about the same number of B.t.u.'s per gallon, but gasoline has the higher calorific value per pound. Alcohol by itself has about half the heating value of either of the other fuels. Compared with gasoline, both benzole and alcohol are slow-burning fuels, and consequently engine design must be modified to suit them. In the first place, compression had to be increased in proportion to the slowness of the burning of the mixture and within the limits of the detonating temperature of the fuel and air mixture.

Elaborate bench tests, made on a standard bus engine with various mixtures of fuel and different carburetor settings, showed that the 50 per cent mixture of benzole and alcohol with 123 lb. compression gave the best results. The whole series of tests showed that the greater the percentage of alcohol the higher are the possible thermal efficiencies for the same compression, and that higher efficiencies are possible due to the allowable increase in compression. However, at low throttle openings, with accompanying low compression, the economy was very poor. The importance of thoroughly vaporizing the mixture by heating cannot be overemphasized.

Due to the presence of water in the alcohol and to its being more volatile than gasoline, some trouble was experienced in starting the motors. An unexpected difficulty arose when, after a bus had been running about a month, the fuel tank and lines were found to have been badly corroded by the benzole. Also a thick tar-like deposit was found on the valve head and in the intake manifold. After the elimination of some of the preliminary difficulties the experiments were successful.

Universal Change Maker

THE advent of the odd-cent fare and the use of metal tickets selling at fractional cent rates have greatly complicated the work of the conductor in making change. The usual form of change maker ejects but one coin at a time, hence with a 6-cent rate of fare in force, it is necessary for the conductor to operate the device four times to eject four pennies in making change for a dime. An improvement on this style of change maker provided for ejecting the four pennies at one operation. This was satisfactory as long as fare remained constant. However, the frequency with which the rate of fare has changed on many properties has made a further refinement in the change maker highly desirable.

Working along this line, the Johnson Fare Box Company, Chicago, has placed on the market a new universal change maker that is adjustable; that is, any barrel may be readily adjusted to eject from one to five coins, or one to six tickets, at one operation. Only a screwdriver is needed to change the adjustment. This arrangement does away with the necessity of discarding a change maker should a new rate of fare require the ejection of a different number of coins or tickets.

The flexibility of the device is further enhanced by the unit construction employed. Each barrel is complete in itself and may be used separately or as one unit of a group made up with whatever number of units are needed to meet local conditions or a conductor's notions. Barrels are designed to handle dimes, nickels, pennies, and metal tickets of two denominations.

The framework and slides are made up of 18 per cent nickel silver, which is exceptionally rigid and will not corrode or tarnish. All parts not subject to wear are made of aero metal to provide increased mechanical strength with light weight.

A new preparation, known as "Meno" Rust Remover and Cleanser, has recently been placed on the market by Peter A. Frasse & Company, New York, N. Y. It is a scientific combination and blending of certain chemical ingredients, which in combination produces an electrochemical action that rapidly loosens and dissolves rust, corrosion, grease, oil, dirt, carbon, paint or any other foreign substance adhering to the metal. Not only are the above virtues claimed by its manufacturer but also that its action automatically ceases when contact between the cleanser and the metal is established.

Soft Metal Bearings

Compositions Containing a Large Percentage of Lead Wear Rapidly, Are Easily Distorted Under Pressure and Do Not Transmit Heat Readily—Practical Limitation of Lead for Car Bearings 15 per Cent

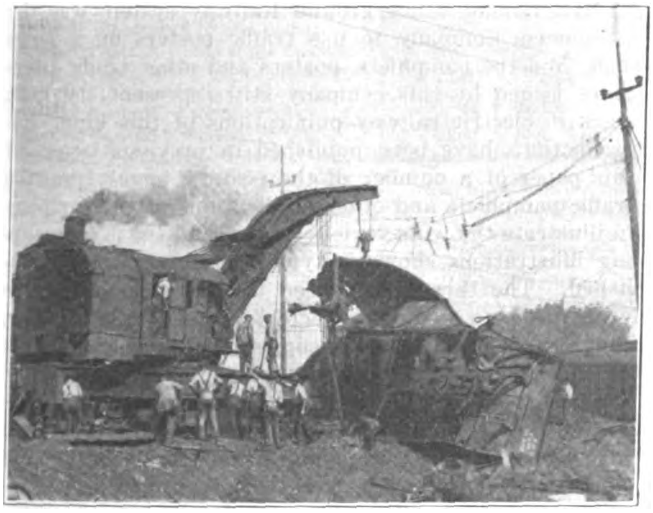
DISCUSSING the properties resulting from different bearing compositions, W. K. Frank, in the *Railway Mechanical Engineer*, says that bearing metals are essentially a mixture, the components of which are distinctly different in hardness. In these metals the softer crystals are abraded faster and develop into depressions, allowing the harder ones to stand above them and support the load. These softer crystals also perform the function of allowing the bearing to be plastic to a limited degree, since fitting is more or less an approximation. As wear is an attendant evil of motion, it is preferable that the bearing wear rather than the shaft, since it is less costly and more easily replaced.

Compositions containing as high as 30 per cent lead find limited application because of their high plasticity and consequent distortion. They answer well the requirement of protecting the shaft, but do not, on the other hand transmit heat readily. They show rapid wear, as is evident to any one who has examined a pile of scrapped railroad car bearings. The high lead bearings can readily be disinguished from the moderately leaded ones by the extent to which the axle collar has worn into the ends of the bearings of the two classes. High-lead mixtures were originally designed to replace the babbitt-lined railroad car bearings, but do not possess sufficient plasticity to accomplish this and are used with babbitt linings. Because of this lining they seldom come in contact with any part of the journal, excepting the collar, and their length of service is determined by the life of the lining, distortion of the back and collar wear.

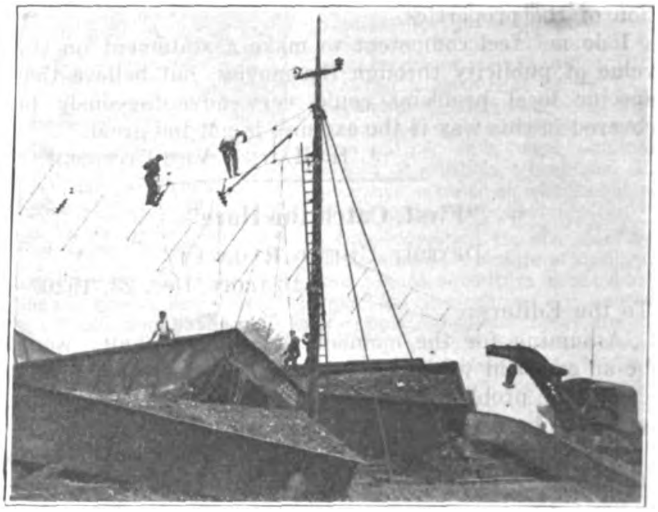
Mr. Frank also says that as far back as 1892 Dr. Dudley of the Pennsylvania Railroad determined the practical limitation of lead content for car bearings to be in the neighborhood of 15 per cent. Later work on this subject has not altered the conclusions he reached in this respect, and it may be of interest to note that twenty-seven years later a table of railroad specifications shows the net average content of lead to be 15 per cent and that of tin to be 8 per cent. It should be remembered, however, that while the 12½ per cent lead and 15 per cent lead alloys wore more slowly than phosphor-bronze in railroad car bearings, this is not conclusive proof that the lead is in itself a wear-retarding element. Lead furnishes the means of allowing the bronze to conform more readily to varying alignment and, by preventing localized pressures, reduces wear. Under comparatively low pressures and absence of impact, but with changing alignment of car axles, the 15 per cent lead alloy shows superiority, whereas under high pressures and impact the phosphor-bronze shows slower wear. A comparison between the pressures of car axles of 325 lb. per square inch and that of 3,500 lb. per square inch encountered in rolling mill practice shows why such alloys are unsuitable for the latter condition.

Moving Day for Catenaries

WHEN a wheel broke on an eastbound freight train on the main line of the Pennsylvania Railroad recently, about a thousand yards west of Wayne Station in the Broad Street-Paoli electrification zone, twenty-three loaded coal cars were scattered over the four tracks. The services of four cranes, two at each end of the wreckage, were required for thirteen hours before one track could be restored to service.



THIS FREIGHT WRECK ON THE P. R. R. WAS DISTURBING TO THE OVERHEAD



BUT THE OVERHEAD, AT THAT, SUFFERED LESS THAN THE RAILS

The work of removing the entangled wreckage was somewhat impeded by the 11,000-volt overhead contact system, as it was necessary to raise large cars within a very limited headroom. However, two of the four tracks were cleared from the overhead obstruction as shown in the illustrations. The wreck occurred at a sharp bend in the right-of-way. The messenger cables were detached from the cross catenary suspensions at the insulators and the contact wires with their messengers were allowed to straighten out, thus reducing the tension in this part of the system and at the same time grouping all four of the contact wires over two of the four tracks. This resulted in increased working space on one side of the right-of-way without appreciably reducing the headroom on the other side.

A peculiar freak of this wreck was the fact that the relatively delicate electric equipment was scarcely damaged, while heavy steel rails were torn completely free from the crossties.

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

More Comment on Railway Movie

Advantages Measured by Cost

THE CAPITAL TRACTION COMPANY
WASHINGTON, D. C., Dec. 23, 1920.

To the Editors:

I have read with much interest the editorial suggestion in your issue of Sept. 25, and also the comments made by the JOURNAL and in various letters which have been published since that time by prominent men.

No one nowadays questions the value and necessity of bringing before the people the real situation of the street railway business. My own thought is that while all of the various publicity methods and policies are good, the most important thing is to make sure that the public knows all the facts in relation to the operation of the properties.

I do not feel competent to make a statement on the value of publicity through the movies, but believe that specific local problems could very advantageously be covered in this way if the expense is not too great.

J. H. HANNA, Vice-President.

"First, Catch the Hare"

DETROIT UNITED RAILWAY
DETROIT, Dec. 23, 1920.

To the Editors:

Assuming for the moment that film publicity would be an excellent vehicle of expression for street railways, comes the problem of how are the pictures, when made, going to be displayed?

First, catch the hare. It is not by any means certain the houses will show them in the form you desire. Getting them made and having them shown are entirely different propositions.

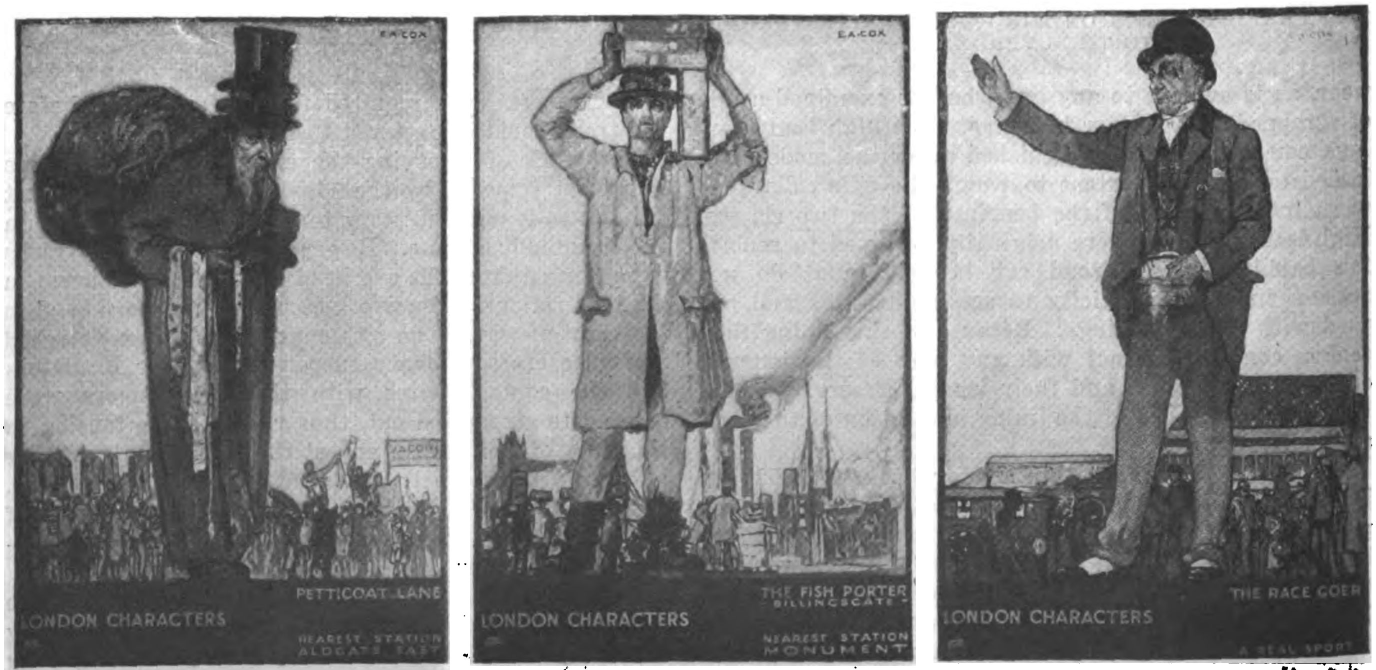
It should not be forgotten that in nearly all communities motion picture houses operate under municipal licenses, and it takes no stretching of the imagination to realize that any group of picture places will prove gun shy for fear of offending the municipal authorities and, as a result, jeopardizing their rights to operate. This I know to have been the experience not more than a million miles from here.

All this is aside from the very debatable question if people want to be instructed when they go to be entertained.

A. D. B. VAN ZANDT,
Publicity Agent.

Attractive Posters from London

THE London Underground Railway system was the pioneer company to use traffic posters on a large scale, and the pamphlets, posters and other traffic literature issued by this company still represent the high mark in electric railway publications of this kind. Reproductions have been published in previous issues of this paper of a number of the posters, pages from the traffic pamphlets and other publications of the company to illustrate the wide variety issued, and the accompanying illustrations show six typical posters recently published. The three reproduced on this page belong to what is known as the "character" group. That is to say, they represent individuals supposed to be characteristic of the underground stations whose names appear on the posters. The three posters on the opposite page are of a different nature and represent characteristic scenes of resorts reached by motor, tram or underground, all three systems being operated in conjunction.



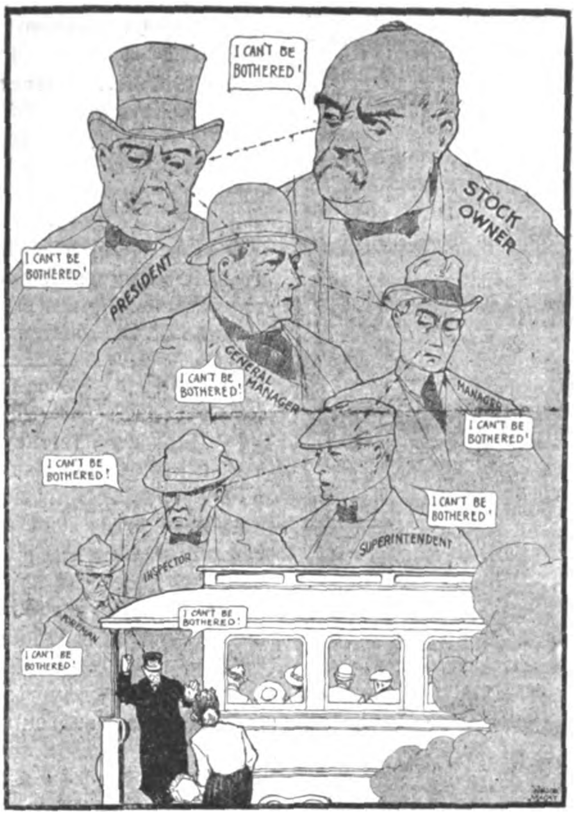
THE LONDON UNDERGROUND USES THESE NOVEL "CHARACTER" POSTERS

How Bad Relations May Be Promoted

IN THIS department of the *Electric Railway Journal* many articles have been published on how to promote good relations between a utility and the public. The accompanying reproduction shows how bad relations between a utility and the public which it serves may be developed through what was evidently an unfortunate selection by a cartoonist of a subject to illustrate a good editorial idea. The cartoon is from the Washington (D. C.) *Times* for Sunday, Dec. 5.

The picture shows the "stock owner" and each official of an electric railway company, from president to platform man, as being indifferent to the comfort of the public. The "stock owner," a corpulent and plutocratic man, throws this duty on the president, saying, "I can't be bothered." The president repeats the same message to the general manager, and so on down the line. Finally, the conductor refuses to help an old lady with a child upon the car.

The text of the editorial accompanying the cartoon bears no evidence that the editor considers the attitude illustrated in the picture is characteristic of the average electric railway. It urges efficiency, attention to duty and individual responsibility upon every member of every business organization—a very good message. Nevertheless, the reader who only glances at the page might easily gather the conclusion that, in the opinion of the editor, the scene pictured is characteristic of electric railways.



Cartoon from Washington "Times" showing "I can't be bothered."

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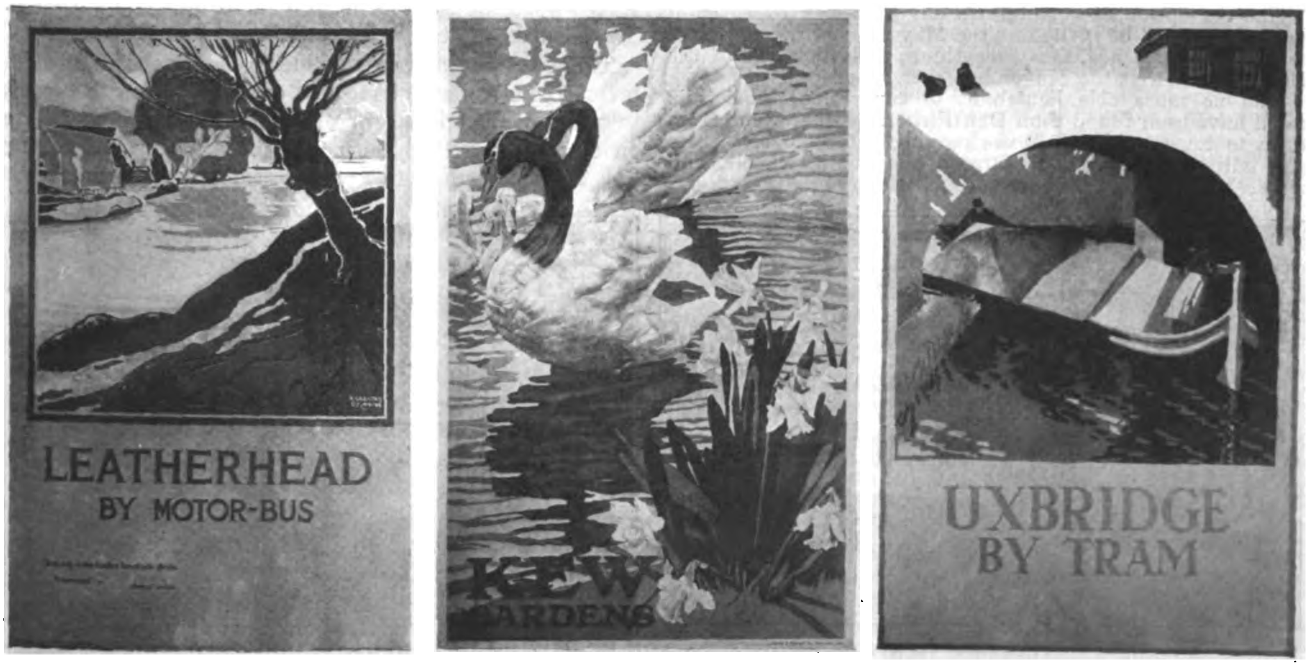
During the last four or five years utilities have had to contend against many difficulties in the way of high prices of all supplies used by them — conditions brought about by the war. These conditions may be considered as unavoidable, being worldwide. It is most important for newspapers and cartoonists not to make the work of utility rehabilitation more difficult by exciting unwarranted prejudice. We hope that the next time Mr. McCay wants to use an electric railway simile to illustrate an editorial on organization he will give a pleasanter expression to the officials and have them repeating to each other some such expression as "the public be pleased." The caption for such a cartoon might be the opening words of the code of principles adopted by the American Electric Railway Association in 1914: "The first obligation of public utilities engaged in transportation is service to the public."

Here is another suggestion as to how Mr. McCay might have made his picture of an electric railway organization more true to life. It is in connection with his portraiture of the "stock owner." Statistics of the proportion of electric railway securities held by men, women, estates, savings banks, insurance companies, charitable institutions and the like for the entire country are not available, but they have been compiled in a few cases, as in Brooklyn. The recent report by Stone & Webster on the Brooklyn Rapid Transit System gives these figures for that property, and there is no reason to believe that the percentage in that case would vary greatly from the percentage on other property. The figures given in that report cover the ownership of all of the securities of the Brooklyn Rapid Transit System, including the securities of the Brooklyn City Railroad and the Prospect Park & Coney Island Railroad, leased lines.

Of the total of 23,985 holders of these securities, 7,247 were women and estates, and 2,034 were fiduciary and philanthropical institutions of the type mentioned. A later report of the Brooklyn City Railroad shows that of its 1,472 stockholders more than a half were women and of the remainder more than 28 per cent were administrators, executives, guardians, life insurance companies, charitable institutions and colleges.

Our suggestion to Mr. McCay, then, in his next picture of a railway organization, is to substitute as a typical stock owner, for the plutocratic looking man in the upper right-hand corner, the old lady now shown at the bottom of the group.

Here is still another idea for Mr. McCay. In his next cartoon, let him show how important the railways are to the social and business life of the community. Then let him point out the lesson that, for this reason, the authorities should adopt a constructive policy in dealing with them



ATTRACTIVE COLORED POSTERS OF RESORTS REACHED BY LONDON UNDERGROUND

Gaining Public Confidence

CO-OPERATION with the city authorities to accomplish a real idea in creating good will for the railway company and at the same time performing a service to the community is one of the recent accomplishments of Dan Fisher, assistant to the president of the Dallas (Tex.) Railway Company. Mayor Wozencraft of Dallas conceived the idea of having a children's day at the Great Fair, at which every child in Texas should be invited as the Mayor's guest, and Dan Fisher saw an opportunity to do something big for the community in this connection. How he accomplished it is indicated by the following editorial, which appeared the day after Children's Day:

DAN FISHER AND THE MAYOR AS ENTERTAINERS

> Pin a medal on Dan Fisher. Hand a bouquet to Mayor Frank W. Wozencraft!
>
> The boys and girls agree that Children's Day at the Texas State Fair was an unqualified success and that for the pleasure it afforded them they owe a debt of gratitude to these two.
>
> The conception of a children's day on which every child in Texas should be invited as the Mayor's guest, free street car tickets furnished, free everything, almost, is one of the biggest ideas that the Mayor has ever sponsored.
>
> And no more able lieutenant to carry out the details could have been found than Dan Fisher. Fisher went from town to town in North Texas passing out the free tickets and telling the glad news through the public schools, and where he couldn't go, he sent.

We doubt that ever before in one gathering have so many children come together.

From information since obtained, it appears that there were 150,000 children attending the fair that day, a large part of them being carried upon the lines of the Dallas Railway. Private automobiles, buses and trucks were also pressed into service. The handling of such a great crowd, particularly children, was something which probably never before had been done by a state railway in the United States in a city the size of Dallas, at least.

The spirit with which Mr. Fisher entered into the proposition is indicated by the accompanying photograph, where he and Mayor Wozencraft are surrounded by some of the children they made happy.

A "Tickler" for the Public

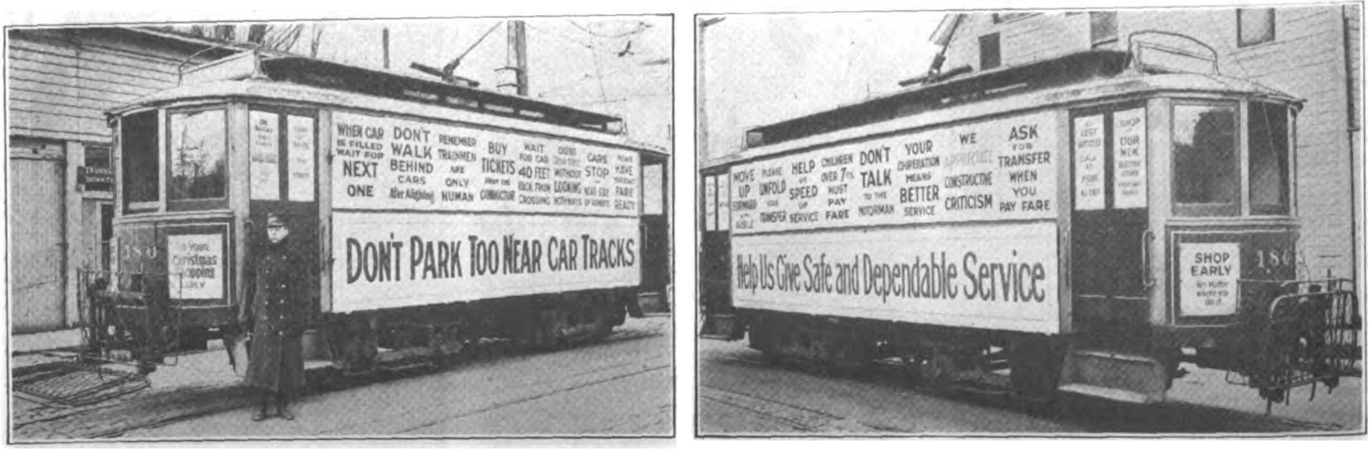
WHEN an efficiency engineer wants to speed things up a bit and make the organization "get a hump" on, he sends out a "tickler." W. B. Strandborg, publicity man of the Portland Railway, Light & Power Company, Portland, Ore., has adopted that same idea and put it on wheels, and the company is now operating a "Trolley Tickler on Wheels," over all the streets in the congested down-town district during the busy hours of the day.

The car is a converted one-man car and is completely smothered and surrounded by cute and gaudy banners, signs, cards, etc. Some of them are slogans to arouse interest in the educational campaign of the National Safety Council, some had to do with early Christmas shopping in the Christmas season, and others relate to "Service Suggestions" to help speed up service through co-operation on the part of the traveling public.

There are two large banners, one on each side along the body of the car, reading: "Don't Park Too Near Car Tracks," and "Help Us Give Safe and Dependable Service."

There are sixteen smaller signs covering the car windows and a set of four smaller cards appear on each end of the car. The accompanying illustrations show both sides of this trolley "tickler" and the ingeniously worded signs which are used. Of timely Christmas interest were the four dash sign cards on early shopping. These cards are to be changed from time to time.

The "tickler" attracted widespread attention and interest from the start and the company plans to keep it in permanent operation. The banners and cards are on cream-colored oil cloth with black and red lettering and can be read from a considerable distance.


WHEN CAR IS FILLED WAIT FOR NEXT ONE
DON'T WALK BEHIND CARS After Alighting
REMEMBER TRAINMEN ARE ONLY HUMAN
BUY TICKETS FROM THE CONDUCTOR
WAIT FOR CAR 40 FEET BACK FROM CROSSING
DON'T ... WITHOUT LOOKING
CARS STOP ... NEAR SIDE
HAVE FARE READY
DON'T PARK TOO NEAR CAR TRACKS
Christmas Shopping EARLY
180
MOVE UP FORWARD ... AISLE
PLEASE UNFOLD YOUR TRANSFER
HELP US SPEED UP SERVICE
CHILDREN OVER 7 YRS. MUST PAY FARE
DON'T TALK TO THE MOTORMAN
YOUR COOPERATION MEANS BETTER SERVICE
WE APPRECIATE CONSTRUCTIVE CRITICISM
ASK FOR TRANSFER WHEN YOU PAY FARE
SHOP OUR NEW ...
Help Us Give Safe and Dependable Service
SHOP EARLY
186
TROLLEY TICKLERS ON WHEELS ARE EFFECTIVE IN PORTLAND, ORE.

Determining Physical Characteristics of Steel Rails by Magnetic Analysis

THROUGH the efforts of several steel experts who recognized the great practical value and immense possibilities of magnetic testing to the metallurgical industry, an apparatus has been perfected and placed on the market which enables one to establish the relation between the magnetic and mechanical properties of called the Burrows magnetic analyzer, is now obtainable steel and detect imperfections. Such an, apparatus from Holz & Company, New York.

The principle on which this analysis is based is that there is but one set of mechanical conditions corresponding to every set of magnetic characteristics. There are two separate analyses made, one using a magnetoscope, which gives information about the composition and mechanical and heat treatment of the specimen, but does not give any indication of the existence of flaws, and the other, the defectoscope, which determines whether non-uniformities exist, but does not indicate whether or not a specimen is hard or soft. The analyzer consists of a magnetizing solenoid wound on a brass tube, inside of which is a test-coil unit conforming as nearly as possible to the section of the specimen. The unit consists of two coils of fine wire having an equal number of turns and connected with ballistic effects opposed. This outfit, which surrounds the specimen, is driven at a constant speed along it and whether used to analyze quantitatively or to detect imperfections depends on the connections and circuits, for which two separate control boxes are furnished.

Magnetic surveys and analyses, it is claimed, will furnish information impossible to secure by any other means of testing. The fact that materials can be tested without destruction is of prime importance, and it is this feature of magnetic analysis which makes it possible to find in advance those rails which, after injury under straightening presses, would develop in service a complete interior transverse fissure. It is also suggested that this test would eliminate the occasional defective rail before it leaves the mill or is put in the track.

Automatic Control of Humidity in Shops

THE United States Forest Products Laboratory has developed a plan for conditioning the air in shops, particularly for woodworking shops, although it is applicable elsewhere.

The apparatus consists of a small cabinet, or chamber, through which the air is drawn as often as it needs to be conditioned. The conditioning chamber contains water sprays whose temperature is kept constant by a mixing valve. These sprays suck in the air by their own action, cool it to the temperature at which it should be saturated and give it all the moisture that it can hold.

As the air leaves the chamber it is heated to room temperature by coils, whose steam supply is controlled by a thermostat located in the outlet. Thus, when the air is drawn into the chamber, it may be too hot or too cold, too moist or too dry, but the apparatus automatically humidifies or dehumidifies it and brings it to the correct temperature before allowing it to pass again into the room. Both in the storage rooms, where the air needs conditioning very infrequently, and in the workrooms, where it is completely changed every ten minutes, the recording instruments show that the atmospheric conditions have varied to only a slight extent throughout a three-year period.

Drawings of the apparatus and further details concerning its installation and operation may be had on application to the laboratory at Madison, Wis.

Association News

Transportation to the Mid-Year Conference

ARRANGEMENTS are under way by the committee on transportation for special Pullmans to the Chicago conference on Feb. 10.

The committee believes it possible to arrange for special cars from Detroit, St. Louis, New York, Boston, Cleveland, Philadelphia, Baltimore and Indianapolis. R. B. Fisher, chairman of the committee, has made the following assignments: D. W. Smith is to canvass Detroit and vicinity; Col. A. T. Perkins and F. O. Grayson, St. Louis and the southwest; C. R. Ellicott, New York City; A. F. Walker, New England, and if the proposed trip from Boston to Chicago via Montreal is undertaken, Montreal as well; Paul Wilson, Cleveland, Buffalo, Toledo and intermediate points; A. H. Englund, Philadelphia and Pittsburgh, and R. B. Fisher, Peoria, Columbus, Louisville, Indianapolis, Cincinnati, Evansville, etc.

All those planning to attend the conference are urged to get in touch with the men assigned to their home territory with the view to joining with others and making special reservations possible.

December Reports Available

THE following special reports and compilations have been prepared by the Bureau of Information and Service during the last month:

Record of All Increases in Rates of Fare in Cities of 25,000 Population and Over from 1917 to Date.—This compilation shows all fare increases that have occurred classified by calendar years in each of these cities.

Trackless Trolleys.—Summary of replies to association's questionnaire sent to foreign companies, describing types of equipment, operating conditions and costs.

Analysis of Agreements with Trainmen.—This covers a number of the larger electric railway companies and is a comparison of the working conditions relating to hours of labor, extra compensation paid under various circumstances and limitations in the making of schedules and time tables.

Owl or Night Car Service.—Based on replies to questionnaire, showing rates of fare, frequency of service, percentage of system included, and comparative financial results.

List of Cities Having Increased Rates of Fare as of Jan. 1, 1921, Summarized on the Basis of the Cash Rate of Fare.

In addition to the above, the bulletins on trainmen's wages and cost of living have been brought up to date by means of supplements.

Any of the above compilations will be forwarded to member companies upon request.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Wage Discussion in Detroit

Trainmen Continue Negotiations—Officers and Other Employees Reduced Jan. 1

The first of the series of conferences between the officers of the Detroit (Mich.) United Railway and its platform employees to consider the company's proposed reduction in wages was held in the company's offices on Dec. 28. It has been intimated that arbitration on the disputed points and a referendum vote of the men on the wage question would be acceptable. Further conferences will be held.

In a letter signed by officials of Divisions 90, 111 and 26 and the Monroe Branch of Division 26 of the Amalgamated Association the request is made that the company adhere to the terms of the wage contract. The division associations have specific contracts with the company covering the question of wages. These do not expire until May 1, 1921. This fact is pointed out in the letter to the company. It is also contended that after the men agreed to the wage settlement in May, 1919, covering that year, the cost of living kept increasing with the result that the wages agreed to, in a short time after their acceptance, were not sufficient to meet the cost of living during the remainder of the year. The men claim that they lived up to their contracts with the company while suffering losses to themselves and families and now appeal to the company to carry out its part of the agreement.

Replying to the company's intimation that the subject has not been fully submitted to the men employed by the company, it is stated that the representatives would be willing to prepare a circular clearly explaining the propositions the company has made and the replies that have been made by the committee, and submit them to a referendum vote of the membership of the divisions and to abide by the majority vote.

Relative to arbitration of the matter, it is stated that the existing agreements provide how disputes shall be arbitrated. The only question is whether the company has the right to set aside the written contracts that exist. That question the committee members are willing to arbitrate.

QUICK ADJUSTMENT NECESSARY

The Detroit United Railway states that, fully alive to the conditions in which the company finds itself, executive officers, heads of departments and workers within the departments are cooperating to practice every economy possible. They have accepted decided reductions in salaries and wages beginning Jan. 1. The conferences with representatives of the several organizations of motormen and conductors have been arranged with the same end in view, that increases granted to meet the growing costs of living may be voluntarily relinquished in part and to such an amount as to have a material bearing in permitting the company to continue without cessation of its service to the public. It is stated that any adjustment other than a speedy one would be detrimental to the community.

Railway Legislation Likely in Iowa

The Legislature of Iowa meets during the present month for its biennial session. It is expected that the lawmakers will take notice of the present difficulties existing between Iowa municipalities and electric railways. At present there are known to be at least four railway measures which will be introduced in the General Assembly.

Officials of the Iowa League of Municipalities announce that their organization is interested in at least three such bills. One of these measures delegates to cities the right to fix rates of fare in traction franchises. This bill will be introduced only in the event that the decision in the Ottumwa street railway case is reaffirmed when it comes up for hearing late this month.

Another measure will prepare for permissive legislation allowing cities at their own election to relieve traction companies from paying for paving between tracks.

Still another bill will cover the jitney question and would allow cities the right to grant franchises to bus companies under which the companies would be assured of contract protection over a period of years. It is frankly admitted by the backers of this measure that it is a club to hold over the electric railways. At the present time companies operating bus lines are given no assurance of protection.

Backers of a fourth bill propose that electric railway extensions be financed by special assessments against the property in the territory to be benefited. The theory back of both this bill and the one which would require the property owners to pay for the paving between the tracks in front of his property is that the general taxpayer should not be assessed for neighborhood improvements, but that the property owner who is benefited should share the expense. The tendency of late years has been to relieve the general taxpayer of expense which covers benefits of a local character.

Valuation Act Protested

New Jersey Commissioners Recommend Recent Law Be Amended to Give It Review Power

The annual report of the Board of Public Utility Commissioners of New Jersey, a summary of which was made public on Dec. 29, refers to the increases in fares recently proposed by the Public Service Railway and in this connection discusses the act passed by the Legislature of this year providing for the selection by the Governor, State Treasurer and State Comptroller of a firm of engineers to value the property of the electric railways.

LIMITATIONS OF BOARD

The report states that, as the act requires it to accept the report of the engineers as to the value of the property in any rate proceeding, the board will be powerless to exercise any independent judgment as to the value. It cannot give consideration to the estimates of value, exhibits and testimony submitted by experts employed by the board, the associated municipalities and the company. The board recommends that the law be amended so it may give due consideration to the engineers' report and other information helpful in arriving at the value of the property.

During the year, owing to the difficulty of obtaining coal on contract deliveries; its high cost; the expiration of contracts for oil, and the inability to renew contracts except at greatly increased prices, all the gas companies in the State have been adversely affected. Companies whose bonded indebtedness is less than the fair values of their properties have been unable to meet operating costs and fixed charges.

The question with respect to such companies has not been what rate will meet operating costs, provide for depreciation and pay a reasonable return on the fair value of the property; but what rate, if any, can be fixed which will enable the utility to continue to supply service at a price commensurate with its worth.

EXPEDITING LOADING SUCCESSFUL

The inauguration of a system whereby tickets or cash receipts are sold during the afternoon rush hours at two ferry terminals of the Public Service Railway, thereby speeding the loading of cars, has improved service, and the same method recently adopted at several heavy points in Newark, the board states, bids fair to be successful.

During the year approximately 150 one-man cars have been put in operation by the Public Service Railway and forty by the Trenton & Mercer County Traction Corporation.

Many Suggestions for Relief of Electric Railways

Public Utilities Commission of Connecticut Presents to Legislature Constructive Document Recommending Aid to Railroads and Corporate Reform—Federal Report Quoted

The Public Utilities Commission of Connecticut on Jan. 5 sent to the General Assembly a report of its inquiry into the electric railway conditions under an act of the 1919 session in which it makes many suggestions for legislation to relieve these companies.

An outstanding recommendation is that the Attorney-General be authorized to ask the federal court to vacate a judgment against the New York, New Haven & Hartford Railroad by which the Connecticut Company was taken from the railroad and placed in the hands of federal trustees. The electric railways might then be returned to the New Haven road, as it is a Connecticut company, doing a state business solely, and have the corporate stock and control vested where it was before.

CORPORATE REFORM URGED

Suggestions for corporation and managerial reforms include: Division of the system into well-defined operation parts under competent managers; separation of operating revenues and expenses of each division; greater attention to routing of cars and maintenance of schedules; supply auxiliary motor vehicles in chartered territory; increase the number of one-man cars in urban service; closer attention to heating and sanitary conditions in cars; greater publicity in operating and financial conditions; closer touch with local conditions; closer co-operation with city officials; quicker movement of cars; obtain co-operation and not antagonism of the public; stricter observance of courtesy; prompt correction of defects and annoyances.

Recommendations for legislative consideration include plans for relief to the companies from statutory obligation on paving, bridge maintenance, etc., to a considerable extent; relief from highway bridge construction and maintenance; extension of time in which to pay taxes due to the State; authorizing municipalities to subsidize local lines, etc.; to operate motor vehicles.

It is recommended that jitneys be declared common carriers and regulated as such, and that municipalities be vested with jurisdiction over jitney routes, schedule and supervision.

Recognition is given in the report to the work of the Federal Electric Railways Commission, and the opinion is expressed by the commission that the benefit of that investigation and report should not be overlooked in the report made by that commission. The Connecticut Commission then quoted certain conclusions and statements by the federal body believed to be applicable to the situation in Connecticut. One such statement was to the effect that "the electric railway furnishing transportation upon rails is an essential public utility and should have the sympathetic understanding and co-operation of the public if it is to continue to perform a useful public service." The Connecticut Commission then quoted from the federal report in regard to credit, the distance tariff or zone system and jitney bus competition.

The commission did not deem it expedient at this time and in its report officially to decree its concluded fair value of the companies' property for rate making purposes, based upon the different valuations or indices of value submitted, other than to state that such valuation as of this date would undoubtedly equal or exceed the minimum figures submitted, after making due allowance for depreciation. The following table shows the valuations obtained by the commission for the Connecticut Company's owned and leased lines:

	Valuation, 1910-1914	Valuation, 1919	Historical Cost, 1919
Connecticut Company owned lines	$36,135,897	$65,044,614	$41,011,815
Connecticut Railway & Lighting Company lines leased to Connecticut Company	15,781,829	28,407,292	19,741,537
Connecticut Company owned and leased lines	$51,917,726	$93,451,907	$60,753,352

The commission said in part:

The success of any utility company depends largely upon the character, efficiency and progressiveness of its corporate management. It is necessary that the company, through its officers, should obtain and retain and merit the confidence and goodwill of the public. If this valuable and essential asset is lacking the corporate management should immediately become exercised, and scrutinize its own conduct, and overcome the defect as far as possible, even if necessary to change the personnel of such management to effect such result.

From numerous public hearings and investigations had, pertaining to Connecticut Company matters, the commission is led to the conclusion that the general public does not possess that degree of confidence in the officers and managerial policies of the company which best results require. We say this without intending to cast undue aspersions upon any of the officers of the company, but as a statement of existing conditions, affecting the public welfare.

The lines of the Connecticut Company are divided into operating divisions, each in charge of a manager or superintendent who reports to the vice-president and general manager of the company. Local managers and superintendents are given but limited authority over the operation of their respective divisions. Many matters other than those of minor importance, and which should be decided promptly in order to accommodate the public and render efficient service, must be referred to the general manager or other superior officer at the central office in New Haven. We believe this condition should be remedied, and that local managers or superintendents should be given greater authority and held responsible for the proper conduct of business in their respective territories, as far as operation is concerned.

Owing to economic conditions and a series of events extending down from its early organization and development to the present time the electric railway industry in Connecticut, metaphorically speaking, has become and is a very sick patient, and it is not expected that the remedies administered at this time will immediately transform the patient into a sound, healthy and prosperous being. We believe, however, that its weakened vitality is sufficiently strong to respond to curative remedies, and, when such remedies are administered, that its own recuperative forces, wisely exercised, will enable it to return gradually to a sound, healthy and efficient operating condition.

The commission does not favor or recommend at this time government or municipal ownership, particularly in view of the complications that would now be involved in bringing about such a result.

The commission does not recommend the so-called "service-at-cost" plan, advocated by some railway experts and others as being the sole and only reasonable policy for the benefit of the people and the salvation of the electric railway industry. This plan contemplates a rate which will produce sufficient revenue to pay all operating, fixed and overhead charges and a guaranteed return on the value of the property. It makes dividends a fixed charge, thereby increasing the absolute obligations of the company.

Theoretically, private ownership and operation of a public utility, with public regulation, is on the service-at-cost plan, but practically, when a utility company, through unavoidable circumstances, mismanagement, or other cause, is unable, with a reasonable rate, to obtain sufficient revenue to pay its operating expenses, taxes, and a fair return on the value of the property, the investors in the enterprise must stand the burden of the reverses. Possibly it is unfair to make invested capital stand all the burden, but it would be equally unfair to guarantee a fixed return on the capital or value of the property and make the public bear all the burdens of business reverses which might, in a measure, be due to corporate errors of extravagance.

A guaranteed return has a tendency to lessen the incentive on the part of the officers of the company for improvement and greater efficiency. Any policy, which immediately transposes a near bankrupt concern into a 6 or 8 per cent dividend-paying business, must of necessity increase the rates to the public.

We believe that electric railway service is a public necessity, and in the rendition of such service for the benefit of the public the company should be relieved of all unnecessary burdens, destructive competition, and too heavy taxation, which ultimately the car-riders have to bear. As a necessary industry, relieved as far as possible of public burdens and unfair competition, it should be self-sustaining from its traffic revenues, and present an inviting field for new capital required for extensions and betterments.

Certain corporate and managerial reforms can be effected without special legislative enactment, and we have, therefore, divided this subject into two groups.

Suggestions as to reforms contained in the commission's recommendations follow:

1. (Applicable to the Connecticut Company). Divide the company's entire system into a suitable number of specifically defined operating divisions (not more and preferably less than the present number of divisions), each in charge of a competent manager.
2. Give each division manager authority and full power to act on all matters pertaining to the efficient operation of cars, and hold him responsible for the successful operation of his division.
3. Keep the accounts pertaining to operating revenues and expenses of each division separate.
4. Give greater attention to the routing of cars and maintenance of schedules.
5. Obtain accurate information relative to non-paying lines and (provided legislative authority is granted) substitute and develop motor-vehicle service wherever and whenever practical on such lines; also supply auxiliary motor-vehicle service in chartered territory when necessary.

6. Increase the number of one-man cars for urban service.

7. Give closer attention to heating, ventilating and sanitary conditions of cars.

8. Give greater and constant publicity to the operating and financial conditions of the company.

9. Keep in close touch with local conditions and requirements, and try to obtain the co-operation and not the antagonism of the public.

10. Endeavor to obtain closer co-operation of city officials in relieving congestion, and for the more expeditious movement of cars.

11. Enforce strict observance of courtesy on the part of employees to the company's patrons.

12. Promptly investigate and correct minor defects and annoyances affecting the comfort and spirit of co-operation of the traveling public.

13. Always bear in mind the fact that the rendition of street railway service is primarily for the benefit of the public, rather than for the profit of the stockholders or to satisfy the demands of employees when detrimental to economical and efficient operation.

Recommendations for legislation contained in the commission's report follow:

1. That street railway companies be relieved from present statutory obligations of paving, surfacing and maintaining public highways used in street railway operation, excepting that portion of the highway next to and within 8 in. alongside of each rail.

2. That street railway companies be relieved from contributing toward the expense of construction and maintenance of highway bridges over which their tracks cross, excepting that portion of the expense involved in the company's own construction and maintenance, which shall be paid for in full by the company.

3. That payment of present unpaid taxes due to the state from street railway companies be extended over a term of years without interest, and that all future assessment of taxes against street railway companies be levied on net operating income, obtained under honest, efficient and economical management, instead of on gross revenue as at present.

4. That street railway companies be permitted to abandon non-paying lines or portions of lines, subject to the approval of the Public Utilities Commission after public hearing.

5. That municipalities be authorized to enter into contracts of guaranty with street railway companies, affecting gross or net operating revenues; also to subsidize or otherwise take over the control and operation of non-paying lines of street railways within their respective corporate limits.

6. That street railway companies be permitted and authorized to operate automobile buses or other form of approved street transportation, through and along highways over which they operate street railway service, either as substitute for or auxiliary to such service; also to operate such buses or other approved form of transportation over and along adjacent and additional highways and routes, upon finding by the Public Utilities Commission, after public hearing, that public convenience and necessity require such operation and form of public service; the operation of such buses in all cases to be common carriers and subject to the regulation and supervision of the Public Utilities Commission and the laws pertaining to motor vehicles and drivers of public service cars.

7. That jitneys, so called, and all public service motor vehicles (excepting legally defined taxicabs), transporting passengers for pay, be declared common carriers and, in addition to the requirements of the general motor vehicle laws, shall be subject to public regulation as follows:

(a) All drivers of jitneys and public service automobiles shall first obtain an operator's license therefor from the commissioner of motor vehicles, who shall continue to prescribe the requirements of and have full jurisdiction over the qualification of such drivers, with full power to suspend or revoke such license at any time for cause shown.

(b) All public service motor vehicles transporting passengers for hire shall continue to be subject to inspection and approval by and conform to the requirements of the commissioner of motor vehicles, and shall be limited in number of passengers carried at any one time to the number prescribed by said commissioner.

(c) Giving to municipalities original jurisdiction to regulate all public motor vehicles operated within their corporate limits, as to public convenience and necessity for such operation, routes, schedules, rates and amount of service required on any route, together with such other public regulation and traffic requirements as may be deemed proper; provided, however, that any party aggrieved by any rule, order or requirement prescribed by a municipality, pertaining to public convenience and necessity, routes, schedules, rates or amount of service, shall have the right to appeal therefrom within thirty days thereof to the Public Utilities Commission, and the Public Utilities Commission on all matters so coming before it on appeal shall hear the case *de novo* and shall have full and complete jurisdiction therein.

(d) All public service motor vehicles rendering interurban service on through routes from one city or town to another shall be under public regulation within the exclusive jurisdiction of the Public Utilities Commission as to public convenience and necessity, rates, schedules and routes.

Nothing in the act to be construed as giving the municipality jurisdiction over routes, rates, service or schedules of public service automobiles or buses operated by street railway companies.

8. That the Attorney-General, acting for and in behalf of the State of Connecticut, be authorized to take such action as may be deemed necessary to bring about a termination of federal control of the Connecticut Company, and have the capital stock, property and corporate control and management of said company returned to and reinvested in the owner or owners thereof.

Temporary Aid Suggested by Governor

Chief Executive of Connecticut Urges Remission of Bridge and Paving Charges and Regulation of Jitneys

Governor Everett J. Lake of Connecticut in his inaugural message to the General Assembly on Jan. 5 recommended that temporary aid be extended to the electric railways in the State by relieving them in part or in full from the duty of contributing to the cost of maintaining bridges used by their cars and from bearing the burden of street improvements in thoroughfares occupied by their tracks. The Governor is an engineer. He has, perhaps, on this account had opportunities for the study of the railway problem not ordinarily possible to executives coming from other walks of life.

THE Governor said that he was of the opinion that financial aid could not constitutionally be given to the electric railways. Besides recommending temporary relief in regard to the remission of pavement and bridge expenses, he urged that the Public Utilities Commission be authorized to supervise jitney buses instead of having these vehicles regulated by the cities. Legislation to enable the electric railway to operate motor buses also was recommended by him.

RAILWAY SITUATION ACUTE

In that part of his address dealing with the electric railways the Governor said:

The electric railway situation in the State is acute and demands your early attention. The situation is one which concerns not only those of you who come from the centers of population, but it is of vital importance to every section of the State and to the tax-paying public as a whole.

Some of the electric railway systems have been abandoned, others are being continued in operation under the supervision of the state courts, and one is being operated by trustees appointed by the United States court. Few, if any, have paid any dividends to their stockholders in recent years and, indeed, it is a vital question as to whether they can under present economic conditions continue even to exist and operate.

Fares have been increased after investigation by and with the permission of the Public Utilities Commission, but still the receipts have not kept pace with the increased expense of operation, regardless of the costs imposed upon such companies under existing laws for taxes, for contributions to paving, for bridges and for other public improvements.

This condition exists not only in Connecticut but in every other State, and the subject has been extensively investigated by various independent associations, state commissions and federal agencies.

The last Connecticut General Assembly directed the Public Utilities Commission to make a full investigation of the situation in this State and report its conclusions and recommendations to your body. At the earliest moment after you consider them together with the other sources of information I have mentioned, give the subject thorough investigation, and determine what measures are necessary for relief.

GOVERNOR HIS OWN INVESTIGATOR

My own investigation leads me to recommend the following:

1. I am strongly of the opinion that financial aid, whether temporary or otherwise, cannot constitutionally be extended to electric railway companies from the public treasuries, either from state funds or from those of municipalities or communities served by them.

2. I recommend that electric railways be relieved in part or in full, for a limited period, from the duty now imposed by statute of contributing to the cost of street improvements. This should not, however, include the releasing of such companies from the obligations of replacing such portions of the pavement as are taken up in repairing or constructing their own property by the companies themselves.

3. The present contribution required of such companies to the cost of highway bridges over which their tracks pass may fairly be cancelled in whole or in part.

4. Until it has been convincingly shown that the motor bus or jitney as a transportation medium can fully and at all times fill the place of the electric car, running on defined tracks throughout the congested sections of population in the State, and that it can do so with the same measure of safety to its passengers and to other users of the highway, I believe it to be your duty to see that the present electric railway service is rendered possible, and to prevent by all reasonable methods any interruption of such service. This entails the regulation of the public motor bus, its routes of travel, and the inclusion of it among other classes of common carriers with similar duties and responsibilities. Regulation of this sort by separate municipalities, each acting independently and each case involving local questions aside from the main issue, has provoked exasperating delays and precipitated a crisis in many communities, and has, I believe, been satisfactory to no one. This supervision and regulation should be given to the Public Utilities Commission, and a finding from this commission of public convenience and necessity should be a necessary prerequisite for the operation of any public service motor vehicle upon any route of travel.

5. Any additional legislation deemed necessary to enable the electric railway to operate motor bus lines, and particularly as connecting links with or feeders to their regularly maintained lines, should be enacted.

6. Believing as I do, that many of the troubles of the electric railway are due to the abnormal economic conditions of the present time and that more normal conditions will prevail in the not very distant future, I recommend that the various measures of relief be, in so far as possible, of a temporary rather than a permanent nature.

RAILWAY A MONOPOLY

7. Costly experience has taught that the public is better and more economically served in the public utilities under well regulated monopolies than under irresponsible competition; and this, I believe, holds true with our transportation situation.

8. You should bear continually in mind that this investigation and the desired measures of relief have for their prime object, not to further the financial interests of either electric railway owners or jitney proprietors but to promote the public welfare and to assure by fair means ample transportation facilities.

Detroit Case Before Supreme Court

Detroit United Railway and City Present Arguments Before Highest Tribunal to Establish Their Respective Rights

The case of the Detroit (Mich.) United Railway, to stop the construction of municipal lines in Detroit, was scheduled to open on Jan. 3 before the United States Supreme Court in Washington with Charles Evans Hughes and Elliott G. Stevenson representing the Detroit United Railway and Clarence E. Wilcox, Corporation Counsel, and Alfred Lucking, special counsel, appearing for the city.

ACCORDING to a statement by Mr. Stevenson before leaving for Washington, victory for the Detroit United Railway in the pending suit would put an end to the construction of a municipal system under the present Couzens plan. If the suit is won by the city, and the city proceeds under the present plan as approved by the voters last April, it is contended that chaos will result during the time the Detroit United Railway tears up its tracks on streets where franchises have expired, and while new lines are being constructed by the city.

CASE SET FOR JAN. 3

City street railway officials contend that the hearing before the Supreme Court represents the last stand of the Detroit United Railway against the construction of the municipal lines voted last April. An injunction sought in the District Court by the company immediately after the election was denied by Federal Judge Tuttle. When a temporary injunction was sought from the Supreme Court, the court advanced the hearing of the appeal to Jan. 3.

In discussing the bearing of the outcome of the case on the street railway situation in Detroit Mr. Stevenson explained that it may have a very important bearing on the situation, and it may have no bearing but to turn the whole subject and controversy back to the local and state courts for determination.

The attack made by the railway had for its principal object the amendment of the municipal ownership proposition adopted last April, upon the ground that this adoption was brought about by the electors being imposed upon as to what was involved in the proposition submitted.

INCREASED TRANSPORTATION PROPOSED

The proposal, according to Mr. Stevenson, was to increase tranportation facilities for passengers in Detroit, not to destroy the most important part of those existing, and replace them with similar tracks and equipment at greatly increased cost. The methods employed in obtaining the adoption of the proposition, the railway contended, were such that they rendered the proceedings invalid.

This question ordinarily would be held to be a local or state question and not a federal question, but counsel for the railway claimed that in other respects the rights of the company, guaranteed under the federal constitution, were invaded. Moreover, it associated with the claim the alleged invalidity of the submission of the proposition presenting the local or state question referred to. This it had a right to do if there was, in fact, a federal question also involved and this even though in the end the federal question might be decided against the company.

The city has contended from the beginning, Mr. Stevenson stated, that there was no federal constitutional question involved in the suit commenced by the company in the federal court and, although Judge Tuttle held that the company's allegations were sufficient to confer jurisdiction on the federal courts, the city counsel in the Supreme Court still are insisting that there was no jurisdiction in the federal court to pass upon the question presented.

ISSUE COMPLICATED

It will thus readily be seen that if the city's contention as to the lack of jurisdiction of the federal court shall be sustained, the other questions, particularly the question of the alleged invalidity of the municipal ownership proceedings, will not be decided, but will be left for the state courts to decide. If, on the other hand, the company's contention with reference to the jurisdiction of the federal courts shall be sustained, the Supreme Court will proceed to decide the other questions presented and the decision of the court in that event will be of very great importance, Mr. Stevenson states, in determining the relative rights of the company and the city with reference to the cessation or continued operation of the existing street railway.

The first question that will then have to be considered and the question upon which depends the determination as to whether any rights of the company will be involved in carrying out the municipal ownership plans is this: "Has the company now the right to continue to operate its system on the streets when franchises have expired?" The Denver water case and the Kronk ordinance case are cited as involving similar questions.

According to Mr. Stevenson, the Detroit United Railway is not contending that it has any perpetual or other rights except the right conferred with the duty referred to; that duty is to continue to occupy the streets and operate its service until such time as the city has made lawful provision for the transportation needs of the public being met, and it claims that the time has not come when they can require the company to discontinue its service and vacate the street it occupies, no other provision for the public need having been lawfully provided.

Wages Cut in Cleveland

Pay of Track Laborers Reduced Twenty per Cent—Cut for Shopmen Announced

A general reduction of 20 per cent in the wages of track laborers, effective on Jan. 1, has been announced by John J. Stanley, president of the Cleveland (Ohio) Railway. There are now about 200 track laborers in the maintenance of way department who have been getting 50 cents an hour. Hereafter they will receive but 40 cents an hour. Before the war the wage was 26 cents an hour. During the summer the number of employees of the maintenance of way department runs as high as 1,500 men.

A reduction of approximately 15 per cent in the pay of shop department employees of the company has also been announced for Feb. 1. John J. Stanley, president of the company, said:

> This reduction in wages is a forerunner of what we expect to do to trainmen's wages when our agreement with the local of the Amalgamated Association of Street & Electric Railway Employees expires on May 1.

Trainmen in Cleveland now receive 70 cents an hour for the first three months, 73 cents for the next nine months and 75 cents an hour after the first year of service.

The contract with the union can be opened by either party on April 1. Mr. Stanley, it is expected, will serve his formal demand for a reduction in wages of the trainmen about that time.

The maximum rate of fare allowed by the Tayler service-at-cost franchise, namely, 6 cents cash or nine tickets for fifty cents, with a 1-cent charge for transfers, has been in effect in Cleveland ever since the middle of November.

The reduction in wages is due to the fact that receipts under the maximum rate have not come up to expectations. The directors are dubious as to the company's ability to maintain the present service and pay the present wage at the maximum rate of fare.

Three Killed and Fifty Injured in Trail Car Accident

Three persons were killed and more than fifty injured on Dec. 27 in Pittsburgh, Pa., when a trail car of the Pittsburgh Railways broke from the pilot car, dashed four squares down a steep grade and crashed into another car ascending the grade. The accident occurred in Forbes Street, when the coupler broke.

The passengers were thrown into a heap in the center of the car and many were trampled in the mad rush of those uninjured to escape from the car. The passengers in the car following the trailer were thrown to the floor by the impact and many were cut.

Brooklyn Lines Reviewed

Manager of Surface Properties Deplores Attitude of Local Administration—Fare Increases Planned

In a statement to the board of directors sent to the stockholders on Dec. 31 H. Hobart Porter, vice-president and general manager of the Brooklyn City Railroad, reviews the condition of the property as well as the situation of the electric railway industry generally in the United States.

Five-Cent Fare Confiscatory

He asserts that a fair return on the Brooklyn City lines is impossible at a 5-cent fare and that "under existing conditions the sole hope of the stockholders must be that their property may be preserved until such time as the transportation problems of the city shall be taken up and considered by fair-minded men to the end that the people of the city may have a well-developed transportation system which can continuously provide for their needs."

Mr. Porter states that the electric transportation systems of the city of New York have been confronted not only by the problems which have seriously embarrassed the operations of electric railway companies all over the United States but also by special difficulties due to the attitude of the municipal administration which, he adds, has steadfastly refused to co-operate to solve these problems. He contrasts the position of the New York municipal authorities with that of other cities whose co-operative attitude, he declares, has resulted in increased fares being granted in almost every important city in the country.

Many Queries from Stockholders

Supplementing his statement to the directors Mr. Porter said that it was made necessary by the many inquiries which the officials of the company were receiving from the stockholders, who were unable to understand why this property, always considered one of the most conservatively capitalized public utilities in the United States, with a record of paying dividends for many years, should, since the termination of the lease with the Brooklyn Heights Railroad, have failed to make any distribution to the stockholders.

It is being constantly pointed out to the management of the Brooklyn City Railroad by these stockholders, Mr. Porter continued, that the stock had been purchased as a safe and conservative investment for women, trustees and estates and that the failure to pay dividends was working great hardships. Mr. Porter pointed out that out of approximately 1,500 stockholders one-half were women and that in addition much stock was held by trustees, administrators, guardians, life insurance companies, charitable institutions and colleges. As a matter of fact, Mr. Porter said, approximately two-thirds of the stock of the company is so held, the remaining third being divided between individuals and other corporations.

Mr. Porter says that the fiscal year of public utilities companies in New York State ends on June 30, and that it will not be possible until after June 30, 1921, to make a report which will show the results of independent operation of the Brooklyn City Railroad for a full year.

The company has recently announced its intention to collect a second 5-cent fare on other lines than the Flatbush Avenue branch, but it is explained that the Mayor in the public press has given instructions for new and further litigation, the only apparent possible object of which, in view of the decision referred to by Mr. Porter, is to cause further delay, embarrassment and expense to the company.

Brooklyn City Railroad Operated Separately

The receivership of the Brooklyn Heights Railroad resulted in breaches in certain covenants of the lease under which the Brooklyn City Railroad was operated and in consequence Judge Mayer, in the United States District Court, ordered the receiver of the Brooklyn Heights Railroad to return the Brooklyn City Railroad's property to it on Oct. 19, 1919, since which time the Brooklyn City Railroad has been operated under the direction of its own officials.

Mr. Milner Represents City on New Traction Board

William L. Milner, author of the cost-of-service ordinance at Toledo, Ohio, has been appointed by the board of sinking fund commissioners to serve on the board of directors of the Community Traction Company, which will begin to function as soon as the new ordinance is legally put into operation.

The board is composed of five members, four of whom will represent the Toledo Railways & Light Company, to which concern the bonds of the Community Traction Company are to be issued.

Mr. Milner will represent the city, which will gradually acquire an equity in the property of the Community Traction Company, through the issuance of paid-up common stock to it at the retirement of any of the bonds through the sinking fund which is made up of a certain portion of the income from railway operation.

It is understood that officials of the company would welcome the addition of several such members of the board to give more public interest to the operation of the lines and to create a larger degree of liaison between the company and the people of the community. Action to increase the membership may be proposed at a later date.

Several more applications for appointment to the office of street railway commissioner have been received by the street railway board of control. It is understood that the choice will be made in the next two weeks.

Suspension of Service Explained

The British Columbia Electric Railway, Vancouver, B. C., experienced a shutdown of four to ten minutes on its light and power system and twenty minutes on its railway system on Dec. 20. The shutdown extended over the entire Vancouver district on both the British Columbia Electric Railway lines and Western Power Company lines, tied in together. Small boys throwing stones broke some insulators which caused the trouble. The suspension occurred at 2 o'clock in the afternoon while the streets were filled with Christmas shoppers. The short circuiting of high tension lines caused a surge on to the other circuits and resulted in the interruption.

In order to explain the situation to the public the railway took space in the newspapers to offer a reward of $100 for the arrest and conviction of the persons causing the damage. One of the advertisements follows:

> WHY THE POWER WENT OFF
>
> The British Columbia Electric Railway regrets the shutdown of electric power on its and the Western Power Company's whole system yesterday afternoon.
>
> The cause was the mischievous breaking of ten insulators on high-tension poles in North Vancouver by boys, according to the evidence available.
>
> As a result, light and power circuits were out four or more minutes, depending upon the district, and the railway lines up to twenty minutes.
>
> Such willful destruction of electrical apparatus, on which the life of the community depends, is punishable under the criminal code, because the cessation of electric current for a moment is liable to cause death (in hospitals), injury to person and loss and destruction of property.
>
> We take this opportunity to acquaint the public of the circumstances surrounding this case, in order that they may co-operate in safeguarding the public service and preventing any recurrence of such criminal interference with the service on which the community relies.

Traction Board Appointed at Portsmouth

A "traction board" for the information, advice and guidance of the city manager in his handling of matters affecting the local railway is the latest move on the part of the city government of Portsmouth, Va.

When Gen. J. P. Jervey, U. S. A., went to Portsmouth as city manager a few months ago he was favorably impressed with the operation of the city utilities commission of Norfolk across the Elizabeth River, and the "traction board" just named is the result of his observation of the operations of the commission in Norfolk. The board appointed by the city manager is composed of J. Davis Reed, director of public safety, as chairman; W. L. Davis, superintendent of the water department, and John C. Neimeyer, commissioner of the revenue of the city of Portsmouth, with M. E. Haugh of the office of the city engineer as secretary.

It will be the duty of the board to study the traction situation in Portsmouth, employ a competent engineer if deemed expedient, to make recommendations for the betterment of the service, to receive and consider suggestions from the public, to hear complaints concerning service rendered and to report to the city manager its findings, conclusions and recommendation for the guidance of the city manager in his associations with the members of the City Council.

The personnel of this "traction board" is of an unusually high type. The appointment of the members by the city manager is heartily approved by the citizens. The board began to function on Jan. 1.

News Notes

To Supplant Weekly Bulletins.—*Byllesby Monthly News* is the name of a new publication issued by H. M. Byllesby & Company, Chicago, Ill. This monthly pamphlet will contain all the news of the preceding month which appeared in the weekly bulletins. It will be confined to four pages. This publication is issued primarily for the information of all holders of securities of the companies controlled by the Byllesby interests.

Offer Made to City.—The Monterey & Pacific Grove Street Railway has offered its properties to the city of Monterey, Cal. A written proposal in the form of an option gives the city the privilege of purchasing the road provided the purchaser shall assume the outstanding indebtedness of the company and compensate the stockholders for their holdings.

Motor Buses for Suburban Traffic.—The City Electric Company, which operates the railway system in Albuquerque, N. M., has announced that motor bus service will be put into effect during this month in order to relieve suburban traffic. The buses will be operated strictly on a fixed schedule and will route just the same as the street cars.

Lease to City Proposed.—A contract has been sent to the city authorities at Elwood, Ind., by the Union Traction Company, offering to rent the Ninth Street and Twenty-eight Street tracks in Elwood and to provide a car to enable the city to operate to the tin plate and glass factories. The city has been without local railway service for the past year.

Civic Organizations Urge Purchase of Railway.—Fifteen civic organizations in San Francisco, Cal., have written the Mayor within a week, according to the San Francisco *Municipal Record* of Dec. 23, urging action on amendment 30, which was carried on the November ballot. This amendment, described in the ELECTRIC RAILWAY JOURNAL of Nov. 6, page 983, is an enabling act which provides a method whereby the city could purchase the system of the United Railroads after that action is approved by popular vote on the plans advanced by the city.

Another Motor Bus Failure.—The Lambeth Motor Bus Company, organized after the failure of the London & Lake Erie Radial Railway to provide service between Lambeth and London, Ont., has gone into voluntary liquidation. The motor bus used was a thirty-two-passenger body on a 3½-ton chassis. In winter, however, it was frequently necessary to suspend the bus service and carry passengers in a horse-drawn sleigh. Fares were raised to a point much higher than the old radial tariffs and a considerable portion of Lambeth's population removed to London. The bus service was entirely too unreliable for them.

Improvement in Quality of Applicants.—J. B. Hayner, superintendent of employment of the Los Angeles (Cal.) Railway, reports that for several weeks past there has been noticed a very great daily improvement in the class of applicants. George Baker Anderson, manager of service of the company, writing in *Two Bells*, said: "The employment offices, once filled daily by groups of men, many of whom were most apparently not fitted for service on the street cars, are now occupied by men numbering among them some of the finest specimens of humanity that one would care to see—men physically strong, alert, ambitious, and frequently well educated—many of them gentlemen in every sense of the word."

A Plea for Public Utilities.—H. M. Addinsell, a member of the Public Utilities Securities Committee of the Investment Bankers' Association, has recently contributed an article to the American Review of Reviews, entitled "Why the Utilities Are the People's Business." In this account he tells of the overwhelming duties and responsibilities of the utility agency and describes the attitude of the average person toward public service in general. Mr. Addinsell spoke along this same line in New London on Sept. 15, when he addressed the annual convention of the Association of Edison Illuminating Company. Reference was made to this speech in the ELECTRIC RAILWAY JOURNAL for Dec. 18.

Mutual Aid Pays Christmas Dividend.—Members of the Traction & Power Mutual Aid Association, composed of employees of the Utah Light & Traction Company, the Utah Power & Light Company and the Phoenix Utility Company, Salt Lake City, Utah, recently held their annual meeting and elected the officers for the coming year. During the year the association paid death claims amounting to $2,300, and sickness, accident and refund claims to members totaling $3,520. A surplus amounting to $4,085 was divided among the 615 members of the association and was pro rated according to length of membership. The employees who were members in good standing of the mutual aid association throughout the past year each received a Christmas dividend of $7.20.

Programs of Meetings

Iowa Engineering Society

The annual meeting of the Iowa Engineering Society will be held at the Chamberlain Hotel in Des Moines on Jan. 18-20. There will be an exhibit of apparatus in connection with the meeting.

Conference on Highway Traffic Regulation

A national conference on highway traffic regulation will be held at the Hotel Washington, Washington, D. C., on Monday, Jan. 10, at 10 a.m. The meeting is the outcome of the discussion on the proposed national traffic law considered at the meeting of the National Traffic Officers Association at San Francisco last summer.

In addition to the fifteen associations which met recently at Cleveland and issued the call for the Washington conference, representatives have been appointed or are being appointed by such important interests as the American Association of State Highway Officials, Council of National Defense, Federal Highway Council, National Automobile Underwriters' Conference, National Conference of Commissioners on Uniform State Laws, National Highway Traffic Association, Society of Automotive Engineers, and U. S. Chamber of Commerce (attending unofficially).

S. J. Williams, secretary and chief engineer of the National Safety Council, Chicago, is assistant secretary of the National Conference on Highway Traffic Regulations.

Indiana Public Utility Association

Philip H. Gadsden, president of the American Electric Railway Association, will be one of the speakers at the annual meeting of the Indiana Public Utility Association in Indianapolis on Jan. 13. The session will be the first ever held in all branches of the industry. Plans for it are being made by a committee headed by Harry Reid, president of the Interstate Public Service Company.

Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, is president of the Indiana Public Utility Association. He will preside at all the sessions, including luncheon and dinner meetings in the Riley room of the Claypool, and a general session in the Assembly Hall. In announcing the date for the meeting Mr. Henry said:

> We are adopting a new idea by planning to have our sessions semi-public. We cannot, of course, hold public meetings within the time and space available, but we are asking all utility company operators who attend to bring with them representative men from their respective communities. We hope to have the list of guests include leaders in public thought from all parts of the State, such as newspaper editors, city and county officials, bankers and business men generally. The public utility industry is the people's business. It is part of our task, therefore, to accommodate ourselves to the public wish. On the other hand, we feel that the public should know our problems and understand our difficulties.

Financial and Corporate

America's Biggest Bus Company

Income from Operation of Fifth Avenue Coach Company, New York, Decreased $90,581

The annual report of the Fifth Avenue Coach Company, New York, America's biggest and oldest motor-bus system, shows that the company is still getting on with its 10-cent flat fare despite large increases paid for wages and gasoline. The operating expenses per bus-mile, exclusive of taxes, rose from 29.03 cents in the year ended June 30, 1919, to 35.54 cents in the following year, and inclusive of taxes the corresponding costs were 35.05 cents and 40.2 cents. This was offset partly by improvements in short-routing and other schedule features which raised the operating income from 46.28 cents to 49.50 cents—an extraordinary record for the last decade of this company. However, the difference between revenue and total operating expenses per bus-mile declined from 11.23 cents to 9.3 cents.

The following comparison is drawn from the preliminary synopsis issued by the Public Service Commission of the First District of New York.

(a) The rule of the company concerning depreciation of equipment, as filed with the commission, provides for a charge to expense from Jan. 1, 1919, "equal to 9.17 cents per bus-mile, which is estimated to be sufficient and necessary to cover such wear and tear and obsolescence and inadequacy as may occur on all equipment." The basis includes the non-revenue miles (39,698). The amount reserved after deducting the cost of repairs comprises $186,304 for depreciation of equipment, $16,686 for buildings and $10,019 for shop tools and machinery.

(b) Reported as "depreciation of tires" is based on the "bus-tire mileage" at the guaranteed tire cost per mile, credit being made for tires which exceed the guaranteed mileage and for scrap.

(c) For payment of claims the company charges expenses (and credits reserve) at the rate of 1 cent per bus-mile. Payments in current year exceeded this allowance by $40,234, which was drawn from the reserve.

(d) Includes balance on unamortized cost of equipment retired during year, obsolete bus parts scrapped, loss on sale of securities, depreciation of vehicle equipment and buildings, etc., and other debits, and credits, such as adjustment of Federal taxes, bad debts collected, etc.

The company employed as of June, 1920, 400 conductors, 382 drivers and 412 "others," a total of 1,194. Total salaries and wages were $2,049,682, an increase of $528,702 over the preceding years. During the year four persons were killed and forty-seven injured.

OPERATIVE STATISTICS OF FIFTH AVENUE COACH COMPANY

	1920	1919
Number of revenue buses	271	279
Round trips made during the year	569,132	513,416
Revenue bus-hours (including 6,084 special)	1,105,935	1,011,939
Revenue bus-miles (active 8,592,277; idle, 166,216; private hire, 37,702)	8,796,195	8,087,127
Number passengers carried at 10 cents	42,552,709	36,488,447

	1920		1919	
	Per Bus-Mile (Cents)	Total	Per Bus-Mile (Cents)	Total
Receipt from fares	48 37	$4,255,271	45 12	$3,648,845
Rent from livery service	0 33	28,710	0 66	53,659
Advertising and miscellaneous	0 80	69,970	0 50	40,194
Total revenue from operation	49 50	$4,353,950	46 28	$3,742,697
Maintenance (*a*):				
Superintendence, ($75,376; shop expenses, $27,006)	1.17	$102,383	0 77	$62,421
Repairs (bus bodies and chassis, $383,276)	4 61	406,239	3 71	299,626
Tires (*b*)	0 98	86,065	0 95	76,596
Depreciation (reserved)	2.42	213,008	1 02	82,503
Total maintenance	9 18	$807,694	6 45	$521,146
Conducting transportation	23 23	$2,043,894	19 68	$1,591,640
Accidents and damages (*c*)	1.35	118,656	1.28	103,682
Traffic—Advertising	0.16	13,908	0.11	8,767
General and miscellaneous	1.62	142,340	1.62	122,360
Total operating expenses	35.54	$3,126,493	29.03	$2,347,594
Taxes	4.66	409,726	6.02	486,790
Total revenue deductions	40.20	$3,536,218	35 05	$2,834,384
Income from operations	9.30	$817,732	11.23	$908,313

Non-operating income (rent, $26,500, interest $23,948)	$50,448	$41,408
Gross income applicable to corporate and lapsed properties	$868,180	$949,721
Income deductions (interest, $8,917 and rent)	85,052	105,763
Net income for year	$783,128	$843,959
Surplus adjustments — net deduction (*d*)	144,322	228,061
Net increase in corporate surplus	$638,806	$615,898

"Save with a Smile"

"Save with a Smile" is the name of a pamphlet issued by H. M. Byllesby & Company, Chicago, Ill., as a further effort on the part of the company to promote thrift and economy. In this booklet of fifteen pages are contained quotations of Abraham Lincoln, Benjamin Franklin, Thomas Jefferson and others on the principles of saving and accumulating money. An interesting account on the subject of investment is given accompanied by a chart which shows the minimum amount of money one can possess at the end of one to twenty-five years if a certain amount of income is saved and invested to yield 7 per cent. The appeal is to "Save With a Smile."

Receiver for Maumee Line

Appointment Made Following Investigation of Committee Representing Bondholders

Following an investigation by the bondholders' committee of the affairs of the Maumee Valley Railways & Light Company, Raleigh D. Mills, assistant cashier of the Home Savings Bank, Toledo, was made receiver for that electric railway by Judge Brough in Common Pleas Court at Toledo, Ohio, during the week ended Jan. 1.

Verdict of $1,675,000 Sought

A verdict of $1,675,000 is also sought against the Toledo Railways & Light Company and other stockholders of the railroad. It is charged that there are unpaid stock subscriptions and that stockholders have double liability in some cases.

The suit was filed in the name of Ella Van Deusen, a creditor of the company. The case goes back into the history connected with the consolidation of the old Toledo & Maumee Railway and the Toledo, Waterville & Southern Railway when the two lines, capitalized at less than $325,000, were merged into a company with a capitalization of $1,000,000.

Attorneys Barton Smith and Rufus H. Baker, who are fighting the Toledo Railways & Light Company, in the present case, were attorney and president respectively of the company which brought about the consolidation in 1902. They repudiate the legal steps taken by their own board at that time.

The claim of the plaintiff in the action is based upon the first mortgage bonds of the old Toledo & Maumee Railway, of which there are $300,000 outstanding. They became due and payable on March 1, 1920, but were not met at that time.

A bondholders' committee was formed with Marion M. Miller, president of the Home Savings Bank, Toledo, as chairman. C. L. Reynolds, of the First National Bank; J. D. Biggers, of the Owens Bottle Company; Frederick W. Stevens, Ann Arbor, Mich.; and George B. Storer, deceased, late of the Standard Steel Tube Company, were appointed members of the committee.

Rolling Stock Rented

The line owns only three cars. The rest are rented from the Toledo Railways & Light Company at $5 each a day. Power is secured from the Toledo Railways & Light Company, and the Toledo, Bowling Green & Southern Traction Company.

Although higher rates and fares were put into effect nearly a year ago the Toledo Railways & Light Company has lost money on the operation of the road for that time.

The road connects Toledo, Maumee and Perrysburg. Included in the system are 23.21 miles of track. Frank R. Coates, president of the Toledo Railways & Light Company, is president of the Maumee Valley Railways & Light Company.

$207,617,530 in Maturities

Sixty-eight per Cent of Grand Total of $305,110,350 of Utility Maturities in 1921 Fall to Electric Railways

Public utility securities falling due for payment during 1921 aggregate $305,110,350 against $196,296,800 in 1920 and $261,887,600 in 1919, according to the *Wall Street Journal.* This unusually large amount is due in a great measure to the fact that many issues maturing in 1920 were extended because of the tight money market and unfavorable conditions for financing public utility corporations. Of the grand total for all the utilities the amount maturing in the electric railway field is $207,617,530.

THE heaviest maturities in the railway field are in New York City. Among these issues are Interborough Rapid Transit three-year 7 per cent notes amounting to $39,199,000, due Sept. 1, 1921, Brooklyn Rapid Transit three-year 7 per cent notes for $57,230,000, due July 1, and Brooklyn Rapid Transit Company $18,000,000 two-year 6 per cent receivers' certificates, due Aug. 1, 1921.

Below is given in detail as compiled by Dow, Jones & Company, the various electric railway issues of more than $200,000 maturing in 1921 in the order of their date:

January		
East St. L. & Suburban conv.	7	$2,116,000
Little Rock Ry. & E. 1-yr. notes	7	1,000,000
Mid. West Util. ser. D notes	6	1,000,000
Pueblo Traction & Ltg. 1st	5	990,000
Rockland, Thom. & Camd. St. Ry	4	800,000
Peoples Railroad 1st	5	750,000
Dallas Electric 5-yr. notes	6	750,000
Pensacola Electric 2-yr. notes	7	500,000
Oklahoma, Railway sec. notes	7	450,000
Decatur Trac. & Elec 1st	5	212,000
Bristol County St. Ry. 1st	5	200,000
Winnipeg Elec. Ry. 2-yr. notes	6	750,000
Total		$9,518,000
February		
St. Louis & Suburban Ry. cons.	5	2,000,000
Un. Rys. & Elec. of Balt., notes	5	1,222,000
United Ry. Investm't 4-yr. notes	5	1,000,000
Wis.-Minn. Lt. & P. 1-yr. notes	7	600,000
Fitchburg & L. St. Ry. cons.	4½	300,000
Connecticut Co. prov. debents.	5	250,000
Total		$5,372,000
March		
Rhode Island Co. 5-yr. notes	5	1,662,000
Amer. Gas & Elec. 3-yr. notes	6	1,390,000
Public Service of Nor., Ill., deb.	6	1,000,000
Oklahoma Ry. Series F notes	8	375,000
Com'nw'th Pub. Ser. 2-yr. notes	6	300,000
Charles City West'n Ry. notes	7	240,000
Total		$4,697,000
April		
Wilkes Barre & Wyo. V. Trac. 1st.	5	$1,500,000
Birmingham R. L. & P. ext. notes	6	1,200,000
Interurban Railway 1st	5	1,160,000
Manchester Trac., Lt. & P., 1st.	5	914,000
Everett Railway & Electric 1st.	5	825,000
Portland Light & Power 1st	4½	500,000
Rapid Tr. St. Ry., Newark 1st.	5	500,000
Total		$6,599,000
May		
Evansville Electric Ry. 1st	4	$1,200,000
Tol., Bowl. Green & So. Trac. 1st.	5	1,003,500
Detroit & N'western Ry. 1st	4½	855,000
Columbus, Del. & Marion R.R. 1st	5	289,000
West End Street Ry. 1st	5	225,000
Kansas City Rys. 3-yr. A notes	7	7,750,000
Monongahela Val. Trac. 1-yr. notes	7	2,000,000
Total		$13,322,500
June		
Puget Sd. T., Lt. & Pr. 3-yr notes	7	$14,601,000
Ohio Cities Gas ser. cv. notes	7	2,000,000
Chattanooga Ry. & Lt. 1-yr. notes	6	750,000
Chi., No. Shore & Milw. R.R. nts.	7	260,000
Total		$17,611,000
July		
Brooklyn Rap. Transit 3-yr. notes	7	$57,230,000
Consolidated Ry. & Power 1st	5	1,401,000
Hartford & Springfield St. Ry. 1st.	5	600,000
Dover, Somer. & Roch. St. Ry	5	300,000
Virginia Rwy. & Power notes	6	200,000
Total		$59,731,000
August		
B. R. T. 2-yr. receiver's ctfs.	6	$18,000,000
Am. Power & Lt. 10-yr. notes	6	2,200,000
Lindell Railway extended 1st	4½	1,500,000
Detroit & Flint Railway cons.	5	1,400,000
Salt Lake & Utah R.R. notes	7	562,500
Iowa Ry. & Light 2-yr. notes	6	731,500
Total		$24,394,000
September		
Interborough R. T. 3-yr. notes	7	$39,199,000
Elgin, Aurora & Sou. Trac. cons.	5	1,546,000
Aurora, Elgin & C. 3-yr. notes	7½	1,219,000
Mid. West Util. Series E notes	6	800,000
Standard Gas & E. 3-yr. notes	7	710,000
South Car. Lt., P. & Rys. notes	7	650,000
Total		$44,124,000
October		
Ottumwa Traction & Light 1st	5	262,500
Hagerstown & Fr. Ry. 1-yr. notes	8	1,050,000
Total		$1,312,500
November		
Western Ohio Railway 1st	5	$2,500,000
Columbus, B. L. & N. Traction	5	1,243,000
Trumbull Public Service notes	7	1,200,000
Seattle Railway 1st	5	335,000
Standard Gas & E. 2-yr. notes	7	4,349,000
Total		$9,627,000
December		
Toledo Tr., L. & P. 2-yr. notes	7	$10,000,000
Portland Ry., L. & P. ser. notes	7	500,000
Wheeling Traction p. m. notes	7	309,530
Mass. N. E. St. Ry. 1-yr. notes	8	230,000
Total		$11,039,530

Public utility bonds and notes maturing in:	
January	$9,518,000
February	5,372,000
March	4,967,000
April	6,599,000
May	13,322,500
June	17,611,000
July	59,731,000
August	24,394,000
September	44,124,000
October	1,312,500
November	9,627,000
December	11,039,530
Total electric railway maturities	$207,617,530
Grand total public utility issues maturing in 1921	$305,110,350

Receivers Appointed for the Toledo & Western Railroad

Harry A. Dunn, assistant trust officer of the Ohio Savings Bank & Trust Company, Toledo, and J. Franklin Johnson have been named receivers of the Toledo & Western Railroad, Toledo, Ohio, by Federal Judge John M. Killits, on complaint of Henry L. Doherty & Company.

The bill of complaint charged that the interurban owed $324,902 to the Doherty interests. A part of this amount was a loan from the Toledo Railways & Light Company, and the remainder from Henry L. Doherty & Company, direct. It was also alleged that many suits were pending in court against the company.

The main line of the company runs west from Toledo to Pioneer and with a branch to Adrian, Mich. The principal business of the company is handling freight. Many manufacturing plants would be deprived of facilities if service were stopped and the line abandoned.

There are $2,500,000 of bonds outstanding against the property. Interest on these bonds is in default.

During the six months' period the receivers are instructed to keep the line in operation, marshal the liens, and test the condition of the road. After that period the property may be turned over to the bondholders, the principal creditors, or junked.

J. Franklin Johnson, one of the receivers, has been general manager of the road for the last eight months.

St. Louis Valuation Between $50,000,000 and $60,000,000

Word reached St. Louis, Mo., on Jan. 4 that the valuation of all the physical properties of the United Railways, St. Louis, including subsidiary and county lines, has been fixed by the Missouri Public Service Commission's experts at a figure between $50,000,000 and $60,000,000.

The valuation figures were arrived at after nearly two years' work by engineers of the commission, going over all the lines in St. Louis and verifying the findings from the company's books. The results are now being tabulated, but will probably not be ready to give out in detail for several weeks.

The fixing of the valuation at between $50,000,000 and $60,000,000 ends all chance of reduction of fare in St. Louis. The present 7-cent fare is based on an arbitrary valuation of $50,000,000 fixed by the commission several months ago. The valuation arrived at by the commission is based on the actual cost of property and not on its present or replacement value.

Purchase Deal Approved by Toronto Ratepayers

By a vote of 28,609 to 1,864, the ratepayers of Toronto, Ont., decided in favor of the purchase by the Hydro Commission of the Toronto and Niagara power and radial railway interests controlled by Sir William MacKenzie. Details of this purchase, known locally as the "$32,000,000 cleanup deal," were published in the ELECTRIC RAILWAY JOURNAL for Dec. 11, page 1209.

The necessary agreements are now being prepared and it is hoped to have them ready for execution upon the return of Sir Adam Beck from England, on Jan. 21. Application will then be made to the Ontario Legislature for the necessary legislation validating the various agreements. The negotiations were in progress for a period of more than two years.

On Jan. 1 the ratepayers of Guelph, Ont., by a majority of 680 voted in favor of turning over to the Hydro-Electric Power Commission the operation and management of the municipal electric railway system. The commission will take possession on April 1 next.

Assessed Valuations Reduced Slightly

The assessed valuations of electric railways in the State of Utah, for the year 1920, have been announced. Of the intercounty electric railways the Utah Light & Traction Company has the largest assessed valuation per mile, exceeding in this respect some of the big steam lines. The board of equalization values it at $49,093 per mile, a reduction from $49,445 a year ago. The total valuation of the company's system is $4,570,590, compared with $4,619,210 a year ago.

Of the interurbans, the Bamberger Electric has by far the highest valuation per mile, $42,492, compared with $40,124 a year ago. The total figures are $1,567,554, compared with $1,476,185 a year ago. The Salt Lake & Utah is valued at $30,349 a mile for its main line, and $24,339 a mile for its branch, the figures comparing with $29,973 and $23,654 a year ago. The total assessed valuation is $2,225,470 this year and $2,194,425. The Utah-Idaho Central is valued at $23,841 a mile and pays taxes on $2,560,070, the figures comparing with $21,179 a mile in 1919, and a total valuation of $2,863,312.

Cincinnati Traction Would Issue $3,750,000 of Notes

Approval of an issue of $3,750,000 of 7 per cent three-year collateral trust gold bonds is sought in a communication from the officers of the Cincinnati (Ohio) Traction Company to W. C. Culkins, Director of Street Railroads. Approval of Mr. Culkins is required under the terms of the amended franchise under which the company is operating. The approval of the State Public Utilities Commission also must be obtained before the securities can be marketed.

The letter explains that of the amount sought $2,250,000 is to be issued as of Jan. 1, 1920, and is to replace temporary notes issued as of that date. The remaining $992,000 is intended for improvements to be undertaken next year. These will include the extension of the Warsaw Avenue line to Covedale, remodeling carhouses, relaying of track on streets to be improved by the city, and other betterments to the lines of the Cincinnati Traction Company.

Traction Notes Fetch Ten Cents on the Dollar

Five per cent five-year collateral trust notes of the Rhode Island Company, Providence, R. I., to the face value of $72,000, were sold on Dec. 29 by G. L. & H. J. Gross at a public auction for $7,200, or 10 cents on the dollar. The purchaser was Benjamin R. Jackson, for the Providence Banking Company.

The notes were part of an issue of $1,662,000 issued by the Rhode Island Company, March 1, 1916, against 20,783 shares of United Traction & Electric Company stock deposited under a Trust Company. The interest on these notes has been defaulted since March 1, 1919.

After the Rhode Island Company went into the hands of receivers the collateral for the notes was deposited with the United Traction stockholders' committee by permission of the Superior Court, to be held subject to the developments of a reorganization. If the traction properties are taken over by the United Electric Railways under the terms of the existing reorganization agreement, each $1,000 note will be secured by approximately 10 1-3 shares of stock of the United Electric Railway.

3,500,000 Fewer Passengers in Philadelphia at 7-Cent Fare

The total number of riders on Philadelphia (Pa.) Rapid Transit Company cars last month, with the 7-cent fare in effect, was 3,500,000 less than the number in December, 1919, at the 5-cent rate, according to W. C. Dunbar, vice-president of the company.

Mr. Dunbar also says that the sale of tickets at four for a quarter made the company's revenue last month exceed that of December, 1919, by $657,589.

Seven per Cent Increase in Operating Income of Tubes

The Hudson & Manhattan Railroad, under federal operation, had a remarkable increase in net income. In 1918 the net income was in fact a deficit of more than $40,000, while in 1919 the same item was $122,300, an increase over 1918 of 400 per cent. The total railway revenue for 1919 increased $1,052,296 or 20.7 per cent over 1918.

At the same time, the total operating expenses increased $868,545 or 33.6 per cent. Net operating revenue for 1919 was $2,680,628, an increase of $183,751 or 7.4 per cent. The remaining items, such as taxes, non-operating income and deductions, were very nearly the same during the two years so that the increase in net income was $163,122, making a net income for 1919 of $122,300, since 1918 was a deficit.

With only 20 miles of single track, the number of revenue car miles amounted to more than 9,275,000. The number of revenue passengers carried was 94,102,461. The operating ratio changed from 50.8 in 1918 to 56.3 in 1919, an increase of 5.5 per cent in one year.

The company operates under the Hudson River from both uptown and downtown New York to New Jersey.

INCOME STATEMENT HUDSON & MANHATTAN RAILROAD

Year Ended Dec. 31:	1919	1918	Percentage Change
Revenue from transportation	$5,747,298	$4,715,120	21.9
Revenue from other railway operations	383,420	363,302	5.5
Total railway revenue	$6,130,718	$5,078,422	20.7
Maintenance of way and structure	518,821	392,986	32.0
Maintenance of equipment	433,851	266,574	62.8
Power	818,750	729,075	12.3
Transportation	1,468,173	995,490	47.5
Traffic	....	715	....
General miscellaneous	210,495	196,705	7.0
Total railway operating expenses	$3,450,090	$2,581,545	33.6
Net operating revenue	$2,680,628	$2,496,877	7.4
Taxes assignable to railway operations	369,278	342,767	7.7
Operating income	$2,311,350	$2,154,110	7.3
Net income from Hudson Terminal building	781,738	795,179	— 1.7
Net income from other real estate	30,487	20,840	46.3
Total operating income	$3,123,575	$2,970,129	5.2
Non-operating income	101,252	96,861	4.5
Gross income	$3,224,827	$3,066,990	5.1
Deductions from gross income:			
Interest on car purchase agreements	$9,033	$17,467	—48.3
Interest on real estate mortgages	43,215	43,795	— 1.3
Rental tracks, yards and terminals	62,050	79,480	—21.9
Amortization of debt discount and expense	39,795	39,795	....
Miscellaneous deductions	139,899	98,740	41.7
Bond interest on N. Y. and J. 5's, first mortgage 4½'s, and first lien and refunding 5's	2,168,535	2,168,535	....
Appropriation to reserve for contingencies	640,000	660,000	3.0
Total deductions from gross income	$3,102,527	$3,107,812	0.2
Net income transferred to profit and loss	$122,300	*$40,822	400.0

* Deficit

STATISTICAL INFORMATION—HUDSON & MANHATTAN RAILROAD

Year Ended Dec. 31:	1919	1918	Percentage Change
Miles of road	8.5	8.5	....
Miles of single track	20.028	18.757	6.8
Number of revenue car-miles operated	9,275,286	8,510,430	9.0
Number of passengers carried	94,102,461	79,964,372	17.7
Statistics per car-mile:			
Passenger revenue (cents)	62.0	55.4	11.8
Gross railroad operating revenue (cents)	66.1	59.7	10.8
Operating expenses (cents)	37.2	30.3	22.6
Net operating revenue (cents)	28.9	29.3	— 1.5
Number of passengers	10.15	9.4	8.0
Car-miles per revenue passenger	0.098	0.106	— 7.5
Statistics per mile of road:			
Passenger revenue	$676,153	$554,720	21.9
Operating expenses	$405,893	$303,711	33.6
Net railroad operating revenue	$315,368	$293,750	7.4
Number of passengers	11,070,877	9,407,573	17.7
Passenger revenue per passenger (cents)	6.1	5.9	4.1
Ratio of operating expenses to total operating revenues, per cent	56.27	50.83	5.44
Ratio of operating expenses and taxes to total operating revenues, per cent	62.30	57.58	4.72

Municipal Ownership Voted Down

On Jan. 3 the property owners of Ottawa, Ont., voted on a by-law to purchase the Ottawa Electric Railway at the expiration of its franchise in August, 1923. The proposition was defeated by a vote of nearly two to one. The company has had a proposal of service-at-cost before the city for the past year, but because of the opinion held by the Councillors that the people desired municipal ownership it has not yet been seriously considered. Now that the wishes of the citizens as to municipal ownership have been definitely expressed it is probable that a new contract based on a flexible fare may result.

Financial News Notes

Increase for Purchase Purposes Authorized.—The Chicago & Joliet Electric Railway, Joliet, Ill., has been authorized to issue $1,350,000 of preferred stock and $5,000,000 of bonds by the Illinois Public Utility Commission. The company has also been authorized to purchase the Chicago & Desplaines Valley Electric Company.

Syracuse Suburban Suspends.—The Syracuse & Suburban Electric Railroad suspended operations on Jan. 1. The road runs from Syracuse, to Fayetteville and Manlius. It has been operating at a loss for some time. Passengers were taken care of by means of a temporary motor bus service and with the help of the New York Central.

$983,000 Loss by Pacific Electric.—The Pacific Electric Railway, Los Angeles, Cal., has announced that its losses for the year ended Dec. 31, 1920, will be approximately $983,000. The company states that the increase in its freight and passenger rates as recently granted have not been effective long enough to show definite gains, but that it is anticipated that with these increased rates operative during the year 1921 the lines will show some profits during this year.

Thirty Per Cent Reduction in Force at Lowell.—At a brief meeting of the Home Rule committee in Lowell, Mass., recently, Manager Thomas Lees of the local division of the Eastern Massachusetts Street Railway stated that about 30 per cent of the operators of cars in the city at the present time were laid off because of the general industrial depression. He furthermore said that the revenue of the district for the month of December would be under what was taken in in November, and that November was under October.

A Conspectus of Indexes.—Albert S. Richey, electric railway engineer, Worcester, Mass., has published on a card of pocket size twelve of the standard index numbers, such as Bradstreet (wholesale commodities) Dun, U. S. Bureau of Labor Statistics (retail food), street railway wages, copper, steel rails, U. S. bank clearances, etc. The figures are grouped in five columns showing respectively 1913 average, peak for the current year, year ago, month ago, and current. An explanation on the back of the card tells the way in which these figures are compiled. It is Professor Richey's expectation to publish these figures each month.

Indiana Interurban Leased.—The Gary & Valparaiso Railway, owning and operating 12 miles of interurban railway between Valparaiso and Chesterton in Porter County, Ind., has recently leased for twenty years the interurban railway of the Gary Connecting Railroad extending from Woodville Junction in Porter County west 16 miles to Broadway in Gary, Ind. At Woodville Junction the leased railway connects with the Gary & Valparaiso Railway, and at Broadway in Gary with the Gary Street Railway. Under the lease, the Gary & Valparaiso Railway will operate and maintain the entire 16 miles of interurban railway, paying a rental to the Gary Connecting Railroad.

Employees Buy Stock. — The campaign started by the Rutland Railway, Light & Power Company, Rutland, Vt., on Oct. 4 for the sale of its 7 per cent cumulative preferred stock to consumers and employees has just closed. This sale presented the first opportunity in the history of the company for the acquisition of that company's stock by consumers and company employees. The sale was conducted entirely by an organization composed of approximately 125 of the latter. During the period the campaign was in force a total number of 422 shares were sold, 233 shares being for cash and 189 on a monthly saving investment plan.

Power Commission Reports Increase in Railway Earnings.—A statement issued by the Hydro-Electric Power Commission of Ontario respecting the Windsor and Essex County electric railways, which were taken over from the Detroit United Railway, claims that during the first seven months of operation by the commission wage advances were granted to employees and surplus revenue increased over the previous corresponding period. The revenue of the corresponding seven months of 1918 was $194,123; 1919, $225,268; and 1920, $296,373. Extra coal costs in an emergency steam plant, operated during a Niagara power shortage, amounted to $27,000, while wages were increased 25 per cent at the outset and later an additional 10 per cent. After providing $49,986 for interest and $11,346 for the sinking fund, the net surplus was $22,335.

$2,134,000 of Notes Offered.—Halsey. Stuart & Company and A. B. Leach & Company, Inc., New York, N. Y., are offering for subscription at 95.25 and interest, yielding about 8½ per cent, $2,134,000 of twenty-year 8 per cent secured gold notes, Series "B." The Middle West Utilities Company through its subsidiary companies operates in the following fifteen states: Illinois, Indiana, Kentucky, Maine, Michigan, Missouri, Nebraska, New Hampshire, New York, Oklahoma, Tennessee, Texas, Vermont, Virginia and Wisconsin. The company's subsidiaries serve 496 communities, having a combined estimated population of 1,317,200. On Oct. 31, 1920, electric customers numbered 221,881, gas 54,784, water 24,778, a total of 301,443 customers for these services alone. Several railway lines are included in the properties that are controlled.

New Bedford Company Takes Over Line.—The trustees of the Eastern Massachusetts Street Railway, Boston, Mass., have voted to recommend to the directors a sale of the so-called Sassaquin line to the Union Street Railway, New Bedford, for a price agreed upon. The line runs between Lunds Corner and the Freetown line. It will take some time to obtain favorable action on the part of various interests involved and to complete the details of the conveyance. Meanwhile, the Union Street Railway company will operate the line by permission of the Eastern Massachusetts Street Railway. H. H. Crapo, president of the Union Street Railway, explains: "If and when the conveyance is completed the Union company will commence to rehabilitate the property and to operate the line in substantially the same way it has been operated during the past year. The Union company has taken on this burden of service without anticipation of present profit and with the knowledge that the existing rates of fare are barely sufficient to cover the operating expenses."

Committee Reports Against Purchase Offer.—A special committee appointed to consider the offer of purchase made by the Western Pacific Railroad to the Sacramento (Cal.) Northern Railway has recommended against the stockholders of the electric line accepting the offer. Miles Standish headed the committee of inquiry. He reported that "the Western Pacific price is inadequate and we are unable to get any better offer." The committee feels that by careful management the road will pay interest on its Class A, B, C and D bonds and also will provide sufficient funds for improvement and betterment. The Sacramento Northern Railway has $5,205,497 of 5 per cent bonds outstanding, in four classifications, and $4,474,607 in stock outstanding. The A and B bonds are paying interest, but the C bonds will not pay interest until July 1, 1922, and the D bonds July 1, 1927. Maturity on all bonds is twenty years from issue, which was 1917. The Western Pacific, it was explained, proposed to issue as against these bonds, at 80 per cent of their par value, paying 5 per cent, first mortgage bonds, maturing March 1, 1946. To absorb the stock the Western Pacific proposed a payment of $26.50 a share on first preferred, $12.50 on second preferred and $5 on common, the par value being $100.

Traffic and Transportation

Further Relief Denied

Commission Refuses to Authorize Straight 8-Cent Fare in District of Columbia—Mr. Ham Dissatisfied

An application of the Washington Railway & Electric Company, Washington, D. C., for an increase in fare to 8 cents straight has been denied by the Public Utilities Commission of the District of Columbia. The commission directs the Washington Railway & Electric Company and the Capital Traction Company to continue the present rate of 8 cents cash, or four fare tokens for 30 cents. That rate is to prevail until April 1 next. In addition, the price of intercompany transfers has been reduced from 2 cents to 1 cent.

TAX REFORM URGED

Owing to the inequality of earning power between the two local railway companies a rate of fare which will allow the Washington Railway & Electric Company a return of 6 per cent on its valuation makes possible a considerably higher return to the Capital Traction Company. The new order of the commission is to apply until April 1 only, in the hope that before that date Congress will have enacted the proposed law relieving the companies of the 4 per cent tax on gross earnings and substituting a tax on net revenue in excess of 6 per cent on the value of the property. Referring to the companies' operations for the past six months the commission says:

> The evidence presented by the petitioners at these hearings shows that in the six months' period that has elapsed since the present rate of fare was fixed by the commission, beginning May 1, 1920, the net income of the companies available for return amounted to $510,489, which amount has been verified by the commission's accountants. Included in the operation of the companies for this period, however, are several items of major renewals and replacements of tracks, totaling $225,696 charged to operating expenses, approximately one-third of which, the companies state, is later to be transferred to capital accounts, representing improvement and betterment to track and roadway. For the purpose of this discussion one-third of this amount should be added to the net income of the companies during the past six months.

The commission takes issue with the interpretation being placed by the two companies of the rules laid down by the Interstate Commerce Commission in the manner of handling renewals and replacements of track. On this point its order says:

> The testimony of representatives of both the Washington Railway & Electric Company and the Capital Traction Company shows that they are attempting to follow the rules laid down by the Interstate Commerce Commission in the manner of treating renewals and replacements of track and roadway. These two companies, however, place different interpretations on those rules, the former apparently capitalizing less than the proper amount, while the latter is capitalizing more than the proper amount. It is the intention of the commission to formulate definite rules to govern such cases, but it is not prepared at this time to announce the proper procedure.
>
> It also appears from the evidence that deductions have been made by the petitioners since July 1, 1920, of approximately $3,750 per month for the purpose of paying the federal income tax. Several of the state public utility commissions have recently questioned the propriety of charging the federal income tax as a part of operating expenses. This commission concurs in the opinion that the federal income tax law contemplates that the burden shall be imposed on the corporation and paid out of its net profits and not passed on to the public.

William F. Ham, president of the Washington Railway & Electric Company, expressed disappointment at the decision of the Public Utilities Commission. The order, he said, would reduce the rate of return to a point where no utility can prosper and which is unfair to those who have invested in the securities of the company. Mr. Ham says that it will make it practically impossible to attract new capital for necessary extensions and betterments. He called attention to the fact that the reduction in the price of inter-company transfers, of itself, means a loss of $18,000 a year. He regards the decision, however, as bringing nearer the merger of the capital's two street railway systems.

The commission points out that recent purchases of coal have been made at a price only 72 cents a ton in advance of the contract price.

Court Holds Iowa "Two-Cent" Law Confiscatory

Judge Martin J. Wade of the United States District Court this week handed down a decision branding the Iowa 2-cent fare law as confiscatory and therefore in contravention of the Federal Constitution. His ruling came upon action brought by five electric railways operating within the State.

The plaintiffs in the case were the Mason City & Clear Lake Railroad, the Cedar Rapids & Marion Railroad, the Clinton, Davenport & Muscatine Railroad, the Iowa Railway & Light Company and the Southern Iowa Utilities Company. In 1918 these companies instituted an action against the Iowa Railroad Commission and the Attorney-General of the State and were granted a temporary injunction. During the war period their lines were not taken over by the government and for a time were compelled to operate in accordance with the Iowa law.

F. F. Faville, recently elected to the Supreme Court of Iowa, was appointed a special master in chancery to consider the case. His recommendations were the basis for Judge Wade's ruling. Judge Wade retains jurisdiction in the action, with full power to modify or dissolve the injunction at any future date upon showing by the Railroad Commission that the 2-cent fare law has ceased to be confiscatory.

Birmingham Rates Effective

Seven-cent Fare Placed in Operation—Commission Commends Receiver for Improving Service

A formal order of the Alabama Public Service Commission granting the Birmingham Railway, Light & Power Company the right to charge a 7-cent fare in Birmingham and on its suburban lines was announced on Dec. 29. The commission retains jurisdiction of the case and recites that the granting of the 7-cent fare is without prejudice to any other rates which may be fixed by the commission later, when reports of the operations of the company, as required by the order, are received. The order includes the lines of the Birmingham-Tidewater Railway and the Birmingham-Edgewood Electric Railway, both of which are owned by the Birmingham Railway, Light & Power Company. The new rates took effect Jan. 1.

In its order the commission declares that it will give careful consideration to any agreement for a reorganization of the Birmingham Railway, Light & Power Company which may be made between the receiver and officials of the company and the city officials of Birmingham. The order also requires the continuation of the sale of school tickets and family ticket books on certain of the longer lines.

QUALITY OF SERVICE COMMENDED

The commission commends the receiver for the quality of service maintained in spite of financial difficulties. Its order said in part:

> The increase of 1 cent in the railway fare operated to increase the gross revenue from all departments approximately 7½ per cent, and therefore increased the cost to the public by only that percentage. The increase now applied for would approximately double that percentage and amount to approximately 15 per cent total increase to the public for all services performed by the utilities involved.
>
> Immediately following the increase of the railway fare to 6 cents twenty-five safety cars were bought and new motor sets purchased for installation on the cars on hand. The railway shops have since been operated to their capacity. The new cars were placed in operation in January, 1920. The old cars thereby released were put through the shop as rapidly as its capacity would permit, and thereafter placed in operation on one line after another, and this process has continued without interruption until nearly all of the motor equipment has been put in good condition. Later nine practically new trailer cars were purchased and are in operation. Recently fifteen additional safety cars have been purchased and put in operation. As a result there has been a constantly increasing improvement in railway service since the fare was increased to 6 cents. Our investigation convinces us that the existing service is, with one or two exceptions, of a high standard and that improvement is still in progress.
>
> We find that the property as a whole had, during the receivership, earned slightly less than its taxes, bond interest and sinking fund obligations. The cash conditions of the receivership estate has reached an acute stage that demands relief. We recognize, too, that there are unusual burdens resting upon the street railways of the Birmingham district in these particulars: (a) The average hauls are long; (b) the traffic is unbalanced on most of the lines; (c) railroad crossings are numerous; (d) the competition from jitneys and private automobiles has been excessive.
>
> The facts stated above are established by the undisputed evidence in the case. Upon the whole we are convinced that the property has been managed with a high degree of efficiency and economy, and that the railway departments have been furnishing service below the true cost.

Would Charge 10 Cents

San José Companies File Applications for Increased Fares, Alleging Big Deficits in Past Year

Declaring that for the last nine months its operation has resulted in a loss of $235,645 the Peninsular Railway, San José, Cal., has applied to the State Railroad Commission for authority to increase passenger fares. The company seeks to increase its 6-cent and 8-cent fares to 10 cents and the charge for school children's 46-ride commutation fares from $1.85 to $2.22. It also proposes the sale of tokens, good for an unlimited time and transferable, for 7 cents each. These tokens will be honored for transportation within any 10-cent fare zone. They must be purchased five or more at a time. The company's rules and regulations governing the issuance and acceptance of street transfers are not to be changed.

NINE MONTHS' LOSS $235,645

According to a financial statement filed with the application, for the nine months ending Sept. 30, 1920, the company's operating revenue totaled $265,370; non-operating revenue, $27,418, a total of $292,789. Operating expenses amounted to $248,996; taxes and depreciation to $21,968; fixed charges and miscellaneous debits $257,469. With the expenses totaling $528,434 the company points out that its net loss for the period amounted to $235,645.

The San José Railroads, which also furnishes service in San José, also applied for authority to increase its fares, claiming that in the nine months ending Sept. 30, 1920, it had sustained a loss of $89,432. A 10-cent fare is proposed for all lines now charging 6 cents and 12-cent and 18-cent fares are proposed in place of the 10- and 15-cent fares now being collected on certain lines. The 15- and 20-cent fares are to be increased to 18 and 24 cents, respectively, according to the plan of the company.

The sale of tokens at 7 cents each, transferable and good until used, is also provided for in the company's proposed schedule. It is likewise proposed to sell thirty-ride family commutation tickets between any two stations the one-way fare of which is 12 cents or more for twenty times the one-way fare. Under the proposed new schedule school children's forty-six-ride tickets will be increased in cost from $1.85 to $2.22. The $2.70 ticket for school children will be reduced to $2.63 and the $3.60 ticket to $3.48.

No Increase Now in St. Paul

The City Council of St. Paul, Minn., has taken steps which will postpone for a month at least an increase in fare by the St. Paul City Railway, a subsidiary of the Twin City Rapid Transit Company, from 6 cents to 7 cents. The Council has approved the report of E. W. Bemis, utility expert, who suggested that the 6-cent fare continue until the early part of this year, when he would recommend further action based on what revenue will be necessary to enable the company to earn a fair return and to finance its paving and other extensions.

The company, according to the report, is earning a 6.6 per cent return on an actual valuation of $11,000,000. The outlay for paving and extensions to be made by the company is estimated at $2,000,000.

Mr. Bemis suggested that some of the needed revenue might be obtained from the depreciation fund and that the balance be obtained by a note from the company to the city, giving the city a lien, equal to the amount of paving, on the company. In his report Mr. Bemis indicated that the neutral zone should be continued, and also advocated the skip-stop, providing the stops were at proper distances apart and properly located.

Asks More in Spokane

That the Spokane & Eastern Railway & Power Company on its Spokane city lines during the first ten months of 1920 sustained losses in operation, including taxes but not interest, of $76,492 is asserted by F. E. Connors, vice-president and general manager, in a petition filed recently with the Public Service Commission of the State of Washington asking that fares be increased from 6 cents to 8 cents. The operating loss while the road, then the Spokane & Inland Empire Railroad, was in the hands of Mr. Connors as receiver is stated in the present petition to have been $250.

The large increase in the deficit is credited to the added expense of operation and the necessity of adding improvements required to rehabilitate the system. Prior to the present ownership, it is stated that the road had been allowed to deteriorate because of the inability to earn enough money to keep it up in proper shape. Further large expenditures will be necessary to keep the property in good condition. The funds for this purpose cannot be had unless an increase in fares is granted.

Like the Washington Water Power Company, the Spokane & Eastern Railway & Power Company is confronted with a request from its carmen for a shorter working day. Platform men of other Northwestern cities are working shorter hours, but in this as in the matter of keeping up the property the railway is handicapped by a lack of money which can only be supplied by increased fares. The petition also states that higher fares are in vogue in other Northwestern cities. The petition, which was filed by Graves, Kizer & Graves, attorneys for the company, seeks to reopen the old fare case heard April, 1919, when the fare was raised from 5 to 6 cents.

The city legal department on Dec. 23 filed with the Public Service Commission a formal protest against permitting the company to reopen the old fare increase case.

Bus Regulation Asked

Council Committee Urges that Restrictions Be Placed on Operation of Jitneys in Hartford

A report has been submitted to the City Council of Hartford, Conn., by the special committee of that body which has been investigating the railway-jitney situation in Hartford. The commiteee urges that the present bus competition be removed. It contends that, if steps are taken by the city authorities to aid the railway through regulation of the jitneys, the city has the right to insist upon improved service and the payment of deferred maintenance charges.

The committee's report follows:

Your committee, while recognizing the popularity of the jitneys with a large number of our citizens, feels strongly that the continued prosperity and development of our city is absolutely dependent upon a permanent, responsible and efficient transportation system. While the service furnished by the Connecticut Company may be inadequate at certain hours, we believe that the great majority of our citizens can only be transported by means of the trolleys with any degree of regularity and efficiency, especially in the winter months.

RAILWAY CALLED ESSENTIAL

We cannot fail to recognize that large sections of our city have been built up because of their proximity to trolley lines; that the trolley company has made large, permanent local investments in its tracks, buildings and equipment, and under its charter and franchise obligation can be compelled to furnish continuous service, provided it secures sufficient revenue to be able to operate. From our conferences with officials of the trolley company we are satisfied that because of the present high costs of operation and equipment it will be impossible for the company to continue operation unless the jitney competition is restricted. From such information as we have received from the officials your committee is satisfied that even in the city of Hartford and with the 10-cent fare, the local lines will not receive sufficient revenue to more than break even between receipts and actual operating costs, provided the Connecticut Company pays its Hartford taxes, its percentage of gross receipts and meets its obligations in the matter of paving the portion of the city streets on which its lines are located. This does not include repairs to trackage, which in certain parts of the city are grievously needed.

If on the other hand, the present jitney competition is removed and the trolley receives sufficient revenue, the city has the right to insist upon improved service and the payment of deferred maintenance charges. In the case of Wethersfield Avenue and Windsor Avenue paving for example, it has been impossible for the city to insist on the performance of this work as the company had no funds which could be used for the purpose and could not borrow them.

The six new routes designated in the proposed amendment to the ordinance for the most part are parallel and would be in direct competition to the trolley lines. They avoid Main Street between Charter Oak Avenue and the tunnel, but provide for the operation of jitneys through such narrow and already congested streets as Prospect Street, Allyn Street, Ford Street and Trumbull Street. These streets are all so congested that they are now receiving special consideration from the police board with a view to further restriction of traffic.

Council Cancels Duluth Referendum

The City Council of Duluth, Minn., on Jan. 3 rescinded its action calling a special referendum for Feb. 3 to place a proposition for a 6-cent fare again before the people. The Council decided on Dec. 24 to call a referendum election providing the expenses of the same should be borne by the Duluth Street Railway, but changed its mind when representatives of the Federated Trades and Labor Assembly charged that the Council would be violating the corrupt practices act if it conducted an election the expenses of which were paid by a private corporation. Herbert Warren, general manager of the company, has announced that the railway is operating at a loss and that the cost of operation must be curtailed or the fare raised. The voters have twice rejected a proposal to allow the company to raise its fare.

Arkansas Bureau Busy

A. G. Whidden, Manager of the Public Relations Section, Waging an Active Campaign of Education

An active campaign is being waged by the recently created Public Relations Section of the Arkansas Utilities Association to inform the people regarding the public service corporations operating within the State. A. G. Whidden, manager of the Public Relations Section, is using for this purpose paid advertisements in the newspapers of Pine Bluff, Fort Smith and other cities. He is also issuing a series of bulletins discussing the utility question, in which he emphasizes the essential nature of electric railways and other utilities.

In discussing the present status of Arkansas utilities recently, Mr. Whidden said that the principal trouble with public utilities throughout the country today is that they have been so starved by lack of adequate compensation that their plants have run down, and many are unable to meet demands made upon them.

LESSON COSTLY FOR PUBLIC

Utility operators could see coming just such trouble as some communities are experiencing, and tried to avert it by appealing to the public and to city councils for fair and equitable rates, so that the high operating expenses could be met, and new generators, transformers and other machinery purchased, said Mr. Whidden. These appeals were not heeded. The people, unfamiliar with operating costs, did not appreciate the situation, nor realize how the public would be affected. So, today, both the public and the utilities are paying the penalty. Mr. Widden continued:

> The utilities are partly responsible for the situation because of their failure to use advertising space in the newspapers to inform the public concerning constantly increasing costs of operation. They realize this now, and, having confidence in the fairness of the public, plan to present their case to the people through newspaper advertisements, and other mediums of publicity.
>
> Of course there will be some to contend this is no time to increase rates, but those utilities that have been starved for years must have some relief if they and the communities they serve are not to suffer more than they have.
>
> Those manufacturers and others who advanced prices to meet higher costs of production can afford to say, "This is no time to advance rates." They have had their necessary increases, and with decreasing production costs, probably may reduce rates or prices. But the utilities are in a different position. They have not had advances proportionate to higher costs, and everything they use—labor, fuel, material—has gone up. The result is they are just about starved out and their efficiency impaired. They must have relief in the way of adequate rates if they are to survive and provide the service necessary to continuous development of the community.

Under the caption, "Public Utilities Pay One-Fifth of Taxes," one of the "ads" sent out by Mr. Whidden says:

> Public utility companies pay 20 per cent of all taxes collected in Arkansas!
>
> This surprising fact is shown by the 1919 assessments. The total valuation of all property was $588,161,065. Of this amount the utilities represented one-fifth, or $115,656,474
>
> Consider what this means: All lumber mills, all mines, all factories, all buildings of whatsoever nature, all improved and unimproved land—everything in the state, except public service companies, paid only $4 in taxes for every $1 paid by the public utilities.
>
> On the basis of 33 mills—state, county, city and special levies in Little Rock—the utilities of Arkansas paid in taxes last year $3,816,663.
>
> On the same basis, all other property in the state paid only $15,592,652.
>
> The utilities actually paid more than $3,816,663, because they are subject to taxes not levied against other property owners—such taxes as pole, corporation, franchise, and other special levies.
>
> If all the utilities in Arkansas were forced out of business by reason of inadequate rates or unjust legislation the people of Arkansas not only would be deprived of the comfort, convenience, protection, pleasure and profit provided by the operation of the light, telephone, water, gas and railway companies, but the rate of taxation would have to be increased to make up the four million the utilities pay toward public improvements, governmental expense and schools.

Crossing Regulations Laid Down

Operation of one-man cars on thoroughfares crossing steam railroads at grade is prohibited in proposed regulations issued recently by the Massachusetts Department of Public Utilities. Exceptions are made to grade crossings at which all train movements are protected by the railroad crew or where a gateman is employed.

Justice John C. Crosby of the State Supreme Court has ruled against the petition of certain employees of the Eastern Massachusetts Street Railway for an injunction to restrain the public trustees from the operation of one-man cars. A demurrer to the petition was filed by the company, in which it was pointed out that the Department of Public Utilities has decreed that the one-man cars are not a menace to public safety as claimed by the petitioners. This demurrer was sustained by the court.

The new rules governing the operation of the cars over grade crossings are the result of several months' study by the inspection bureau of the commission. They demand, in Regulation 1, that every street railway car on approaching a grade crossing shall be brought to a full stop 100 ft. from the railroad tracks. This stop, it is stated, shall be for the purpose of ascertaining whether or not the machinery of the car is in perfect condition for emergency handling.

The car thereafter must be worked slowly to the railroad tracks and again brought to a stop. The operator may not then proceed until he has ascertained that the way is clear and that there is no danger of a train approaching from either direction. This last stop, it is provided, shall not be deemed necessary where train movements are protected by train crews.

Another of the new regulations provides that at all crossings where no gateman or flag tender is employed, unless it be one where movements are protected by train crews, the conductor must leave his car, walk ahead to the tracks and stand there until his car has passed over.

A fourth regulation provides that at all grade crossings there shall be installed a trolley guard so arranged that if the trolley leaves the wire it may be caught by the guard.

Birney Cars Installed on Lines of Heavy Traffic

Birney safety car operation was started on one of the lines of the Youngstown (Ohio) Municipal Railway on Jan. 1. The line selected for the first use of this type of equipment in the Ohio city, the Wilson Avenue and East Youngstown line, serves a large residential section with heavy industrial traffic morning and evening in the city. It has met with considerable automobile competition. Heretofore the base schedule for this line has provided a ten-minute headway with a five-minute headway during the morning and evening peak load periods.

With the safety car in use the all-day service has been placed on a five-minute headway with the peak load service on a two-and-a-half minute headway, the additional morning and evening service being supplied by the old style of cars alternating with the safety cars.

Twelve Birney cars have been assigned to the line, ten being required by the base schedule and two being spares. Including this service forty-four safety cars are in service on the lines of the Pennsylvania-Ohio Electric Company and associated companies in Youngstown, Ohio, and New Castle and Sharon, Pa.

The new service in Youngstown is of special interest because of the problem that is presented in the use of safety cars for the heavy and concentrated industrial traffic and the effect of the frequent service on the automobile competition.

Transit Problem Discussed

C. I. Brooks, chairman, committee on transportation, Miami, Fla., recently submitted the findings of that committee before the Rotary Club. In summing up the transportation problem in Miami he stressed the importance of the motor vehicle. In this connection he spoke of the parking practice in Miami and suggested a parking plan such as is carried out in Cleveland, Ohio. On the street railway subject he declared that the people would have an opportunity to express their choice between the trolleys and the jitneys. He believed that buses were not a dependable system of transportation, but that a street railway system should be in operation which would give not only transportation advantages but would also mean the development of city property.

Transportation News Notes

Seven Cents in Columbus.—The Columbus (Ga.) Railroad has raised its fare from 5 cents to 7 cents under the terms of an order issued by the State Railroad Commission. Fifteen tickets are sold for $1. Thirty school tickets are sold for $1.

Ten Cents Asked in Ardmore.—The Ardmore (Okla.) Railway has applied to the Oklahoma Corporation Commission for authority to charge a 10-cent cash fare on its Ardmore lines. This is the first city electric line in the state to ask for a 10-cent fare on its city system.

Would Raise Zone Rates.—The Valley Railways, Lemoyne, Pa., has notified the State Public Service Commission of its intention to raise its fare from 7 cents to 8 cents in each zone. In October, 1918, the fares were increased from 5 cents to 7 cents. The railway operates between Lemoyne, Carlisle and other points in the Cumberland Valley.

Oklahoma Interurban in Operation.—The Northeast Oklahoma Railroad, Miami, Okla., has been completed and has begun operation. The road, which is twenty-three miles in length, will serve the towns of Miami, North Miami, Commerce, Cardin, Picher, and Century, Okla. J. F. Robinson is president. The other officials are: W. H. Trapp, vice-president; H. B. Cobban, secretary-treasurer and general manager; and H. M. Myers, auditor.

Six Cents in Victoria.—A 6-cent cash fare is now being charged by the British Columbia Electric Railway, Vancouver, B. C., on its lines in Victoria. Six tickets are sold for 35 cents, and ten school tickets for 25 cents. Universal free transfers are retained. The fare was formerly 5 cents cash, five tickets for 25 cents. The railway several months ago applied to the city authorities for permission to charge a 6-cent fare, later amending its petition to ask a rate of 7 cents.

Ten Cents in Framingham.—By authority of the Massachusetts Department of Public Utilities the Boston & Worcester Street Railway, Framingham, has raised its cash fare from 7 cents to 10 cents on several of its lines. The new rate schedule substitutes a 5-cent cash fare for certain 4-cent tickets and abolishes the fifty-trip ticket between Overbrook and Chestnut Hill, formerly sold for $6.75. There is no change in the length of fare zones. It is estimated that under the new rates the railway will receive $30,000 additional revenue annually. The company had a deficit of $58,624 for the first ten months of 1920, and for the past two years has failed to earn operating expenses, taxes and interest.

"Safety First" in Los Angeles.—Carrying the message of "safety first" to 5,000 school children of Los Angeles, Cal., every week the Los Angeles Railway and the Pacific Electric Railway are at present co-operating in a campaign against accidents of all kinds. The railways are employing H. H. Mathieson, safety engineer, to speak before the school children and to present a "safety first" motion picture film. The work is being conducted with the approval of the Los Angeles school board and under the direction of the superintendent of schools. The film shows how accidents happen and how they can be eliminated by eliminating carelessness. It preaches the safe way as the right way and covers all classes of accidents.

A Unique New Year's Greeting.—At the suggestion of W. H. Boyce, general manager of the Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway, New Brighton, Pa., the operating force of these companies adopted a unique method of wishing the car riders a "Happy New Year." Their "card" took the form of an open letter published in the New Brighton newspapers as a paid advertisement. Over the signatures of all the employees of the companies the letter read: "We wish our public a merry, merry Christmas and a very happy New Year. We have tried to do our duty during the year passing out now; and we look forward to 1921, hoping that our work and service will continue fully to meet your approval."

Fares Up on "Panhandle" Lines.—The City Railway, a subsidiary of the West Virginia Utilities Company, Wheeling, W. Va., has been authorized by the State Public Utilities Commission to raise its rates as follows: for passengers within the city from 5 to 8 cents, six tickets are to be sold for 40 cents and school tickets at one-half the regular fare. The former express rates were: up to fifty pounds, 10 cents; from fifty-one to 100 pounds, 25 cents. The new rates are: up to ten pounds, 12 cents; from ten to twenty-five pounds, 24 cents; from twenty-five to 100 pounds, 30 cents; for each additional 100 pounds, 12 cents. The rates charged in the interurban line of the Wheeling Traction Company also were increased by 6⅔ cents between Wheeling and Moundsville. The rates between intermediate points were increased proportionately. The express rates are graduated from 18 cents for one pound, to 30 cents for 100 pounds.

Seven Cents in Fort Smith.—The Fort Smith Light & Traction Company, Fort Smith, Ark., has raised its fare from 6 cents to 7 cents. Children between the ages of five and twelve years are carried for 4 cents each. The new rate was made permanent by the State Corporation Commission unless otherwise ordered. The 7-cent fare went into effect automatically after thirty days' public notice, as required by the state law. A conference was held at which representatives of labor unions, civic organizations and city officials were present and the matter was fully discussed. At the conclusion of the meeting a resolution was adopted that no protest should be filed with the Corporation Commission against the 7-cent fare; therefore the rate automatically went into effect. The management took the public into its confidence and gave it full information regarding the railway's operating and financial problems.

New Publications

Engineering Electricity

By Ralph G. Hudson 190 pages, illustrated. John Wiley & Sons, New York, N. Y.

This book, written primarily for students specializing in branches of engineering other than electrical, contains a brief and concise exposition of the fundamental principles and the customary applications of electricity and magnetism. Enough descriptive matter is included to provide material for a mental picture of electrical devices. Theories are developed with the aid of mathematics where exposition would be long and involved.

The Discovery of Electromagnetism

Published for the Oersted committee at the expense of the Belgian State by Absalon Larsen, Copenhagen, 1920.

The Belgians celebrated during last year the centennial of the discovery of the relation between electricity and magnetism, announced by Prof. J. C. Oersted on July 21, 1820. In connection with this celebration there has been published a pamphlet containing a résumé of the facts attendant upon this great discovery, and giving reprints in the original languages from a number of articles commenting upon the discovery, published in scientific journals at the time of its announcement.

Coal, Iron and the War. A Study in Industrialism, Past and Future

By Edwin C. Eckel, late Major of Engineers, United States Army. 375 pages. Henry Holt & Co., New York, N. Y.

This treatise is the result of a study of the working of economic laws relating to the production, distribution and utilization of these basic elements of the nation's wealth. It is not in any sense technical, but is based on numerous data, and goes to show how world peace is intimately involved with economic and industrial conditions. The book furnishes a stimulus to thought, and in view of the dependence of the electric railway business on coal and iron it might well be carefully read and studied by progressive managers and engineers.

Personal Mention

Governor Picks Mr. Cadle

Chief Engineer of the New York State Railways Appointed Superintendent of Public Works

Public service has borrowed from the electric railway industry one of its most able executives in the person of Charles L. Cadle, chief engineer of the New York State Railways, who has just entered the cabinet of Governor Nathan L. Miller of New York, as Superintendent of Public Works. Mr. Cadle's appointment was among the first to be announced by Governor Miller, who took office on Jan. 1. As Superintendent of Public Works he will have charge of many state improvements, the most important of which is the Barge Canal.

The news of Mr. Cadle's appointment has been taken as an evidence that the new Republican administration intends to co-operate with business interests in working out a constructive program of relief for the state's utilities, including electric railways. The new Governor has already intimated that public utilities are to receive consideration at his hands. It is expected that any reasonable claim which either the utilities or private business will put forth will receive attention.

C. L. CADLE

Mr. Cadle has long been identified with the New York State Railways, which, in addition to operating interurban lines, owns the city systems in Rochester, Syracuse and Utica, first as electrical engineer and more recently as chief engineer. He went to Rochester about thirteen years ago from Cleveland, Ohio, where he had been for two years general manager of the Electric Railway Improvement Company. For about a year previous to that time he was employed in the power department of the Cleveland Railway. For several years he served as electrical engineer of the Rochester lines and was then promoted to chief engineer of those lines. He subsequently became chief engineer of the entire system of the New York State Railways. For a number of years Mr. Cadle has made his headquarters in Rochester.

Association work has for years been of vital interest to Mr. Cadle. He has been a member of the power distribution committee of the American Electric Railway Engineering Association, serving for several years as chairman, and has also served on the executive board of the Engineering Association. He was a member of the American Association committee to confer with the Bureau of Standards on the electrical safety code in 1915 and 1916, and was later made chairman of the committee of the Engineering Association to confer with the bureau on that subject. At the Atlantic City convention last October he was elected first vice-president of the Engineering Association.

S. S. Crane Feted

Scott S. Crane, general manager of the Altoona & Logan Valley Electric Railway, Altoona, Pa., was recently tendered a dinner by the employees of the system, the occasion being the twenty-fifth anniversary of Mr. Crane's connection with the company. When Mr. and Mrs. Crane appeared at the railway's office in answer to a telephone message they found more than 150 employees gathered around the banquet table, two places being reserved for the guest of honor and his wife. Mr. Crane was presented with a phonograph and 100 records, the gift of his fellow workers, and with an autograph album containing the name of every employee of the company. Mrs. Crane was presented with three large bouquets. Commenting editorially upon the event, the Altoona *Mirror* said:

"It was a fine tribute to Mr. Crane, personally and in his capacity as the general manager of the trolley lines. It shows that he has not only the confidence and co-operation of the men who work under him but that he also has their esteem and affection. Such manifestations of good feeling between employer and employee have been all too rare in recent years in many lines of human activity, although it has existed in the Logan Valley family.

"Mr. Crane is entirely worthy of the honor which the men and their families paid him last night. He has always applied the Golden Rule to his dealings with his subordinates, and that is a policy that invariably wins. When other executives have experienced trouble he has been rewarded with service, and the local public has been the real beneficiary."

O. D. Mudgett Promoted

Made General Manager of the Androscoggin Electric Company, Succeeding F. D. Gordon

Electric railway men of the New England section have recently been congratulating Frederick D. Gordon, formerly general manager of the Androscoggin Electric Company, Lewiston, Me., upon his appointment as general manager of the Cumberland County Power & Light Company, Portland. Brief mention of Mr. Gordon's appointment was made in a recent issue. Following the resignation of Mr. Gordon from the Lewiston company several promotions have taken place in that organization, the chief one being that of O. D. Mudgett, who has been made general manager to succeed Mr. Gordon.

As general manager of the Cumberland County Power & Light Company Mr. Gordon will have charge of a property capitalized at more than $2,000,000 and serving a population of 100,000 persons. The railway department of the company operates 106 miles of track, including a number of interurban lines. Mr. Gordon succeeds A. H. Ford, who resigned in the fall of 1919. Since the resignation of Mr. Ford the company has been without a general manager, the heads of the several departments having supervision of the work.

F. D. GORDON

O. D. Mudgett, who succeeds Mr. Gordon at Lewiston, joined the Androscoggin Electric Company about ten years ago. He is a native of Gilmanton, N. H. After obtaining his early education in that city he studied electrical engineering at the New Hampshire State College. Following his graduation from that institution he went to East Pittsburgh, Pa., where he entered the employ of the Westinghouse Electric & Manufacturing Company. He was later transferred to Boston, where his work consisted of commercial engineering. He then joined the Belfast Gas & Electric Company, Belfast, Me. A few years later he entered the employ of the Lewiston company, serving continuously with that organization up to the present.

Mr. Lewis in Buffalo

Kenneth R. Lewis, formerly general car inspector of the Hudson & Manhattan Railroad, New York, N. Y., has assumed the duties of engineer of equipment of the International Railway, Buffalo, N. Y. The position of engineer of equipment is a newly created one. Mr. Lewis will co-operate with J. W. Hulme, superintendent of equipment, in supervising the maintenance of the railway's rolling stock. His work will consist largely in the standardization of parts and in the handling of tests of all materials used in the upkeep and equipment of the cars.

Mr. Lewis is a native of Washington, D. C., where he was born in 1888. He obtained his education in the Washington grammar schools and the McKinley Manual Training School. He has since specialized in electrical engineering and has completed several courses on that subject. He began his railway experience with the Washington & Old Dominion Railway in the fall of 1906. In the following year he joined the New York Central Railroad, serving as an inspector of locomotives in the electrified zone. In 1908 Mr. Lewis accepted a position with the Hudson & Manhattan Railroad, and, after serving in various positions, he was promoted to general car inspector.

Interurban Officials Promoted

Lawrence Meservie has been appointed a division superintendent of the Monongahela Valley Traction Company, Fairmont, W. Va. Mr. Meservie will have charge of the interurban lines entering Fairmont and of a portion of the city system. The creation of the new position and the appointment of Mr. Meservie resulted from a substantial increase in interurban traffic. Mr. Meservie has for many years been a trainman on the interurban lines.

Theodore E. Fitzpatrick has been made an assistant superintendent of transportation of the company. Mr. Fitzpatrick will assist Carl B. Johnson, superintendent of transportation, and will co-operate with A. I. Horton, who is also an assistant to Mr. Johnson. Mr. Fitzpatrick has been in the employ of the railway since 1903. In his new position he will supervise the regulation of traffic on all city routes, as well as on a number of interurban lines.

J. W. Walker has been appointed superintendent of the Traction Light & Power Company, a subsidiary of the Union Traction Company of Indiana, Anderson, Ind. Mr. Walker succeeds J. B. Shaedel, who resigned recently. He is a graduate of Purdue University and was formerly in the employ of the United States Steel Corporation at Gary, Ind.

T. H. Ceperley, who for the past twelve years has been chief operating engineer of power and substations of the Albany Southern Railroad, Albany, N. Y., has resigned on account of ill health and expects to spend the winter in the South. Mr. Ceperley will re-enter the electrical field in the spring. He was formerly connected with the Newburgh Light, Heat & Power Company, as chief engineer of the Newburgh plant, and prior to that with the Fonda, Johnstown & Gloversville Railroad.

Changes in St. Louis

Major R. J. Lockwood Made Assistant Manager of the United Railways in Charge of Purchases

To secure an increase in operating efficiency, Rolla Wells, receiver of the United Railways, St. Louis, Mo., has somewhat reorganized the company's executive personnel. Major Richard J. Lockwood has been appointed assistant manager. Major Lockwood will report to Colonel A. T. Perkins, general manager, relieving him of many duties, and thus enabling him to give his attention to more important matters. Questions pertaining to supplies and purchases will come under Major Lockwood's direct supervision.

MAJOR R. J. LOCKWOOD

The responsibilities of Walter E. Bryan, superintendent of power, and C. L. Hawkins, engineer maintenance of way, have also been extended by Colonel Perkins. The general manager has himself absorbed the duties formerly performed by the chief engineer.

Major Lockwood, the new assistant manager, is a newcomer in the electric railway field, most of his experience having been in steam railroading. He was born in St. Louis thirty-eight years ago. Shortly following his graduation from the engineering department of Washington University, St. Louis, in 1904, he entered engineering and construction work. After holding engineering and executive positions with several roads he became vice-president and general manager of two subsidiary lines of the "Frisco" system in Louisiana. He later served as vice-president and manager of the Appalachicola Railroad in Florida.

During the war Major Lockwood served with Colonel Perkins, who commanded the Division of Combat Railways in France. He rose from a private in the officers' training camp at Fort Oglethorpe through the grades of second lieutenant and captain of Field Artillery, captain and major of Engineers and finally and until the signing of the armistice was made chief engineer of the Division of Light Railways and Roads, A. E. F. In the meantime he was in the thick of things in the Chateau Thierry, St. Mihiel and other engagements.

Walter E. Bryan, superintendent of power, was born in St. Louis on Oct. 21, 1885. Graduating from Washington University in 1907 with the degree of B. S. in electrical engineering he entered the power department of the local railway system. After serving for a time as draftsman he was appointed electrical foreman in charge, under the superintendent of power stations, of substations and electrical work in the power department. In August, 1910, he left the company to become an electrical engineer for the United States Incandescent Lamp Company, but in March, 1911, he returned to the United Railways. In the following year he became assistant superintendent of power stations. Later in the same year he was promoted to superintendent.

Carl L. Hawkins, engineer maintenance of way, is also a Missourian by birth. After completing a course in electrical engineering at Washington University, he was employed by a firm of contractors on railroad construction work in Florida. Shortly thereafter he returned North and entered the service of the United Railways as an engineer in the track department. He was made chief engineer of that department in 1911, subsequently being promoted to engineer maintenance of way.

Charles A. Pohl has been appointed chief engineer of the Niagara Gorge Railroad, Niagara Falls, N. Y. Mr. Pohl is a member of the firm of Bogart & Pohl, civil and consulting engineers, New York City.

M. H. Pitman has been appointed service superintendent of Georgia Railway & Power Company, Atlanta, Ga. In this capacity Mr. Pitman has charge of the gas shops, the gas repair shop, and the gas meter shop, in addition to the electric and steam meter department. He has been connected with the company for a number of years.

Frederick E. Nelson has joined the Twin City Rapid Transit Company, Minneapolis, Minn., as publicity representative. Mr. Nelson has been appointed acting general passenger agent of the Twin City lines during the temporary absence of W. O. Clure, who is now recovering from injuries received several weeks ago in an accident. Mr. Nelson is a newspaper man by profession and at one time or another was connected with several papers in the Pacific Northwest. Since his discharge from military service he has served on the Minneapolis *Journal* and more lately on the Minneapolis *News*.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Prices of Overhead Trolley Line Material Decline

Lower Raw Material Cost a Large Factor—Demand Rather Light and Deliveries Favorable

With the copper market continuing on its downward march in an apparent attempt to set new low price records recently, the expected decline in overhead trolley line material has come about. At this writing electrolytic copper can be purchased as low as 12:50 cents per pound delivered, though large producers are nominally asking 13 cents over the first quarter.

Several of the large manufacturers of trolley line material reduced their prices on January 3, the reduction in two instances averaging 5 per cent on the whole line of ears, crossings, splicers, hangers, etc. In a third case the price drop amounted to about 15 per cent on the same date. Another large manufacturer has not announced any price change as yet.

Demand for this class of supplies on the whole is rather light, though in some instances good sales are reported, on behalf of maintenance work of course. Deliveries are favorable and range from 10 days up to an extreme period of three or four weeks.

Wiring Supply Prices Lower

Pipe, Loom, Armored Cable and Fittings Reduced with Lower Steel and Cotton Costs

Just before the year closed important revisions downward were made on several items of wiring supplies. The first of the independent mills making merchant pipe, closely related to rigid conduit, dropped its price to corporation level on Dec. 31, and was followed by other mills early in January. That was the final step to bring the independent steel market to corporation levels, thereby leaving only one steel market. Stocks are generally pretty well built up but in some sections quite spotty.

Steel strip for flexible armored conductor dropped about 20 per cent late in December so that manufacturers now are quoting price reductions of around $15 per 1,000 ft. of No. 14 two wire. Stocks are large on certain makes with rather low jobbers' prices resulting. Conductor bushings, etc., are also lower, smaller sizes about 33 per cent and larger sizes 8 per cent.

Non-metallic flexible conduit prices are off about 30 per cent, the discounts changing 15 points. Cotton material entering into the make-up of loom is quoted as much as 50 per cent lower in some instances. Stocks are heavy.

Rubber-covered wire prices while low are apparently holding, from $8.25 to $8.75 being a good ruling price in New York City for large lots of No. 14. Weatherproof, No. 14, in 250-lb. lots is quoted at from 27 to 29 cents in New York City.

Long Deliveries of Railway Type Resistance Grids

Demand Is Large and No Stocks Exist Either With Manufacturers or Railways—Prices Firm

Current buying of resistance grids on the part of electric traction companies is heavy and the supply poor. An analysis of individual orders, it is stated, shows that electric lines are buying close to their requirements but nevertheless the total demand is large. For one thing railway stocks of reserve grids are known to be low. With cold weather at hand street car lines are loath to face the possibility of heavy snows with consequent burnouts and breakage of resistance grids without having a fair stock to make replacements.

STOCKS EXPECTED TO BE BETTER

Unfortunately deliveries of grids are running long and rush orders have scant chance of meeting with immediate attention. In fact one of the largest manufacturers is apportioning deliveries on a percentage basis. In view of this condition electric railways are probably anticipating their needs more than would otherwise be the case. Stocks of railway type grids virtually do not exist with manufacturers now, in spite of the fact that one of the latter had as high as 100,000 in stock recently. Deliveries vary greatly according to the particular grid desired, but range as long as three or four months at present and in isolated instances orders have been unfilled as long as seven months. It is expected that within the next three or four months, however, stocks will be well built up in spite of the fact that a good running volume of business is anticipated right along.

The chief problem with which producers have had to contend has been to obtain grey iron castings. The supply is now improving slightly though it is still far from normal. Prices have undergone no change. It is pointed out that the large rejections and losses through breakage on grids constitute an excessive overhead, and this combined with the undiminished cost of castings and other material, manufacturers say, precludes lower prices for some time to come.

No General Drop in Gear Case Prices

One Manufacturer Lowers Price of Sheet Steel Product but No Reductions by Others

Although one of the large manufacturers of gear cases reduced the price of sheet steel cases about seven per cent on Jan. 3, this drop has not been followed by a similar action on the part of other producers, so far as can be learned.

Steel mills have lowered sheet steel prices appreciably within the past month but seemingly the chief reasons why this reduction has not been passed on to gear case consumers are current stocks of high priced material purchased some time ago and high labor costs. These two factors, according to a leading producer, are sufficient to prevent any price decreases on its product for nearly three months to come.

Orders are holding up fairly well, in some instances a slightly lessened demand being noted recently, but on the whole the total volume of gear case business seems to compare well with former years. Deliveries, however, are running longer than usual, especially on malleable cases. The latter have undergone no price change and lower quotations are not expected while the raw material remains so high in price and uncertain as to supply.

Short Supply of Coal in 1920

Scarcity Due to Coal Miners' and Railroad Strikes, Car Shortage and Foreign Buying

One of the chief difficulties with which public utilities and manufacturers had to contend during 1920 was an insufficient and irregular supply of fuel. An extraordinary and long continued chain of circumstances was to blame for this scarcity.

Following the coal miners' strike in November, 1919, surplus stocks were reduced to a comparatively low point. Then, starting with the first of the new year, a car shortage prevailed that lasted through the greater part of the year and seriously hampered efforts of producers to move coal. A wage increase of 27 per cent to coal miners went into effect on April 1, thus increasing the cost of production. Early in the same month occurred the outlaw switchmen's strike on the railroads, and this completed the demoralization of freight transportation. As large consumers were unable to obtain enough coal on contract delivery they entered the open market for deliveries almost at any price.

Successful foreign buying competition further shortened supplies, and as a result speculation and manipulation served to send coal prices skyward. In midsummer utilities paid as high as $16.50 to $23 per ton for coal at New York. At times many of the street railways were on the verge of closing down for lack of coal. Herculean efforts on the part of all concerned and heroic measures that were adopted prevented this, however. Among the latter were orders from the Interstate Commerce Commission virtually embargoing exports of coal, granting regional priorities to districts such as New England that were hardest hit, reserving the preferential use of open-top cars for shipment of coal, and giving the use of assigned cars to public utilities. These measures, coupled with a gradual improvement in transportation, relieved the situation the latter part of the year. Prices have recently been on the downgrade and early in December the last of the preferential car orders was rescinded.

Copper Market at Lowest Prices in Six Years

Further reductions in the copper market bring the producers' prices down to 13 cents a pound, delivered, for first quarter, outside market prices to 12.50 cents and certain small producers' to 12.75 cents. At the same time there have been both good sales made at these prices and increased inquiries.

The latest development, however, is the possibility that large copper producers will withhold heavy tonnages from the market in an endeavor to keep the market from going to still lower levels. The price now is said to be lower than that at which most companies can produce, although at least one producer is known still to be below these prices on his costs. Not since before the war has the metal sold at such low figures as are now ruling.

Easier Prices of Pole Line Hardware

Following the decline in steel prices during the past month, manufacturers of pole line hardware have been gradually lowering their quotations to conform to reduced raw material costs. Furthermore, slackening demand and the overcoming of prevailing long deliveries as winter approached have aided to ease the price situation. One of the leading manufacturers reduced the price of pole line hardware between 10 and 15 per cent the first of December. Another manufacturer followed suit with a drop in price of 15 per cent the middle of the month. A third has just recently announced a price decrease amounting to about 5 per cent.

Back orders have just about been caught up with now, although surplus stocks have not accumulated in any great volume. Some items are occasionally shipped from stock and delivery of the remainder ranges up to 2 or 3 weeks.

Sixteen Cars Destroyed by Fire in St. Louis

A fire which started at 7.25 p.m. on Jan. 3 in the Debaliviere carhouse of the United Railways, St. Louis, Mo., destroyed sixteen cars, damaged seventeen more cars and four trailers and left one section of the building in ruins. The damage is estimated by Receiver Rolla Wells to be $200,000 to the equipment, and $50,000 to the building. The loss is partially covered by insurance. All cars of five lines of the United Railways are housed at the Debaliviere carhouse when not in service. About 100 cars and trailers were in the carhouse and yards when the fire started. Of the cars damaged, seven motor cars and four trailers were seriously impaired and ten cars were slightly damaged.

By drafting cars from other carhouses and from the repair shops the schedules on all lines were maintained the following day. Colonel A. T. Perkins, general manager for the receiver, said the loss would not seriously affect the service although it largely offset the gain of thirty-seven cars recently put into service as part of fifty authorized by the public service commission. To replace the cars that were destroyed will entail considerable expense as many of them were of older types and cost less than half the present selling price of modern type cars.

Origin of the fire was undetermined on Jan. 4, but it was thought the conflagration started in a car standing in the center of the southeast corner of the carhouse.

Rolling Stock

Galesburg (Ill.) Railway, Lighting & Power Company has received ten new safety cars for service on its lines.

Brantford Municipal Railway, Brantford, Ont., Canada, has purchased and put into operation two one-man cars formerly operated on a Connecticut railway which went into insolvency.

W. S. Twining, City Transit Director, Philadelphia, Pa., has called for bids

NEW YORK METAL MARKET PRICES

	Dec. 1, 1920	Jan. 5, 1921
Copper ingots, cents per lb	14.00	12.75 to 13.00
Copper wire base, cents per lb	17.00	16.25
Lead, cents per lb	5.50	4.75
Nickel, cents per lb	43.00	43.00
Zinc, cents per lb	6.00	6.00
Tin, cents per lb	33.25	36.75
Aluminum, 98 to 99 per cent, cents per lb	32.90	28.30

OLD METAL PRICES—NEW YORK

	Dec. 1, 1920	Jan. 5, 1921
Heavy copper, cents per lb	10.50 to 11.00	10.00 to 10.50
Light copper, cents per lb	8.50 to 9.00	8.00 to 8.25
Heavy brass, cents per lb	6.50 to 7.00	6.00 to 6.50
Zinc, old scrap, cents per lb	3.25 to 3.50	3.00 to 3.25
Yellow brass, cents per lb	4.50 to 5.00	4.00 to 4.50
Lead, heavy, cents per lb	4.00 to 4.50	3.50 to 3.75
Steel car axles, Chicago, pet net ton	20.00 to 21.00	17.00 to 18.00
Old car wheels, Chicago, per gross ton	32.00 to 33.00	21.00 to 22.00
Steel rails (short) Chicago, per gross ton	19.00 to 20.00	16.50 to 17.00
Steel rails (rerolling), Chicago, gross ton	20.00 to 21.00	17.00 to 18.00
Machine shop turnings, Chicago, net ton	7.50 to 8.00	6.00 to 6.50

ELECTRIC RAILWAY MATERIAL PRICES

	Dec. 1, 1920	Jan. 5, 1921
Rubber-covered wire base, New York, cents per lb	23.00	18.00
Weatherproof wire base, New York, cents per lb	22.00	19.00 to 20.00
Standard Bessemer Steel Rails, per gross ton	45.00 to 55.00	45.00 to 51.00
Standard open hearth rails, per gross ton	47.00 to 57.00	47.00 to 53.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	73.00	73.00
Rails, girder (grooved), per gross ton, f.o.b. mill	88.00	88.00
Wire nails, Pittsburgh, cents per lb	3.25 to 4.25	3.25
Railroad spikes, drive, Pittsburgh base, cents per lb	3.25 to 4.25	3.65 to 4.00
Tie plates (flat type), cents per lb	3.00 to 3.75	2.75
Tie plates (brace type), cents per lb	3.00 to 3.75	2.75
Tie rods, Pittsburgh base, cents per lb	6.00 to 6.50	6.00
Fish plates, cents per lb	3.25 to 4.25	2.75
Angle bars, cents per lb	3.25 to 4.25	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb	6.00 to 7.00	5.50
Steel bars, Pittsburgh, cents per lb	2.35 to 3.00	2.35
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.20 to 5.35	4.20
Sheet iron, galvanised (24 gage), Pittsburgh, cents per lb	5.25 to 6.55	5.25
Galvanized barbed wire, Pittsburgh, cents per lb	4.10 to 4.85	4.10
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95 to 4.45	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes, A quality), New York, discount	79%	79%
Waste, wool (according to grade), cents per lb	15 to 21	13 to 19
Waste cotton (100 lb. bale), cents per lb	15 to 17½	11 to 15
Asphalt, hot (150 tons minimum), per ton delivered	40.00	40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	36.00	36.00
Asphalt, filler, per ton	36.00	36.00
Cement, New York, per bbl	4.90	4.50
Linseed oil (raw, 5 bbl. lots), New York, per gal	.85	.83
Linseed oil (boiled, 5 bbl. lots), New York, per gal	.87	.85
White lead (100 lb. keg), New York, cents per lb	14.25	14.00
Turpentine (bbl. lots), New York, per gal.	.95	75

* These prices are f.o.b. works, with boxing charges extra.

on 100 steel passenger cars for the Frankford Elevated Railway, which, it is expected, will be operated under lease by the Philadelphia Rapid Transit Company. Bids will be opened on Jan. 25.

The City of New York has ordered forty-three more safety cars from the J. G. Brill Company. This order follows one placed with the same company about the middle of October for twenty-eight safety cars, at a cost of $7,050 each, on behalf of the Staten Island Midland Railway, which resumed operation under the city on Dec. 1. The new cars will be apportioned on the Staten Island and Williamsburg Bridge lines.

The Detroit (Mich.) Municipal Railway has received the first of the 25 safety cars ordered by the Detroit street railway commission for use on the new municipal lines. The remaining cars are expected to arrive at the rate of two each day. The cars will be stored temporarily at the upper end of Montclair Ave., until the first car barn is completed. Plans for the latter are under way but actual construction has not started. The Peter Witt type of double-truck car for use on the heavy traffic streets has been discussed and it is probable that an order for one of these cars will be placed shortly. A car of the Peter Witt type capable of carrying 56 passengers is on exhibition in Cadillac Square.

Track and Roadway

Columbus, Delaware & Marion Electric Company, Columbus, Ohio.—Upon the application of the Columbus, Delaware & Marion Electric Company, Judge E. B. Kinkead of the local courts has granted a temporary restraining order against the Ohio Highway Commission from proceeding with the improvement of North High Street, a distance of about two miles. The complainant alleged that the estimate on the improvement is $380,490, which is excessive and that its share of the improvement will cost $127,000. It is further alleged that this is the wrong time for the award of the contract. It is also claimed that under its franchise the traction company has the right to remove its tracks to the center of the street within a reasonable time and that the state highway commission, by letting the road contract is endeavoring to rush the company in this work.

Power Houses, Shops and Buildings

Monongahela Valley Traction Company, Morgantown, W. Va.—The Monongahela Valley Traction Company has ordered 25 miles of steel towers from the Blaw-Knox Company. The shop work is now under way on these towers.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—The first generating unit of the Lakeside plant of the Milwaukee Electric Railway & Light Company is in service. This new plant, the ultimate capacity of which is 200,000 kw., will give the Milwaukee district ample electric power supply.

Bamberger Electric Railroad, Salt Lake City, Utah.—Since the necessary steps have been taken to give Kaysville a depot on the Bamberger Electric Railroad the Public Utilities Commission of Utah has dismissed the petition of that city for an order directing the railroad company to construct the depot.

Jamestown (N. Y.) Street Railway.—The office building and part of the West Third Street carhouse of the Jamestown Street Railway was destroyed by fire on Dec. 26. A. N. Broadhead, president of the company, estimated the loss at $50,000. The structure was a frame building erected in 1886. All of the company's tickets and records were in steel vaults and were saved.

Trade Notes

The Brenner Manufacturing Company, 19 Gray Avenue, Utica, N. Y., manufacturer of air compressors, etc., has filed notice of increase of capital stock from $250,000 to $500,000.

The Tubular Woven Fabric Company, Pawtucket, R. I., will open a Pittsburgh office in charge of Gray Jones, formerly of the Cutler-Hammer Company. This is effective Jan. 1, 1921.

The American Insulating Machinery Company, Fairhill and Huntingdon Streets, Philadelphia, has filed notice of increase in capital stock from $50,000 to $200,000.

Electric Plant at Evans Bay, New Zealand.—The City Council of Wellington, New Zealand, contemplates a number of improvements, among which are the erection of an electric power station, tramway extensions, new car sheds and cars, to cost about £664,887.

The John E. Thropp's Sons, Lewis Street, Trenton, N. J., has acquired property in the vicinity of Fair Street for future extensions. The company manufacturers mechanical stokers, etc.

The Louisville Electrical Manufacturing Company, 660 South Second Street, Louisville, Ky., is planning to erect a new plant, 60 ft. x 150 ft., for the manufacture of portable electric tools.

The Automatic Reclosing Circuit Breaker Company, Columbus, Ohio, announces the appointment of the W. D. Hammer Company, 508 Traction Terminal Building, Indianapolis, Ind., as its representative in the State of Indiana and western Kentucky.

The American Blower Company, 141 Broadway, New York City, manufacturer of mechanical draft equipment, fans, motors, etc., has increased its capital stock from $1,500,000 to $3,750,000. The company has plants at Green Island, N. Y., and Detroit, Mich.

The Line Material Company, South Milwaukee, Wis., through Vice-President L. E. Hendee, announces that the recent fire which wiped out the office did not halt the company's operations. All vital records were found intact in the safes, while the operating plant was undamaged.

The Power Plant Engineering Company, Seattle, Wash., has been incorporated and offices have been established in the L. C. Smith Building. The company is composed of engineers experienced in power-plant installation and operation, and it is in a position to contract for, design and install all power equipment. It also has the exclusive agency for the Santmyer powdered coal equipment. W. J. Santmyer is president, R. S. Whaley is vice-president, and A. E. MacInnis is secretary-treasurer.

Garnet Blocksidge, railway department, Philadelphia office of the Westinghouse Electric & Manufacturing Company, has resigned to become sales engineer, London office of the Westinghouse International Company. After graduating from the Virginia Polytechnic Institute in 1906, Mr. Blocksidge joined the Westinghouse Electric & Manufacturing Company as a graduate student, and remained at East Pittsburgh until 1912, when he was transferred to the Baltimore office as salesman in the railway and light department.

The Black & Decker Manufacturing Company, Towson Heights, Md., has established a new branch office at 303 Penn Avenue, Pittsburgh, Pa., in charge of W. D. Royer, formerly sales engineer of the Robbins Electric Company, Pittsburgh. This office will be the headquarters for the Black & Decker sales force in western New York, western Pennsylvania and the northwestern part of West Virginia. A service station has also been established at the same address.

New Advertising Literature

Car Seats.—The J. G. Brill Company, Philadelphia, Pa., has issued bulletin No. 247, describing and illustrating "Brill Non-Reversible Seats."

Welding.—Metal & Thermit Corporation, 120 Broadway, New York City, has issued pamphlet No. 39, an illustrated booklet on "Thermit Insert Rail Weld."

Fire Extinguisher.—Foamite Firefoam Company, 200 Fifth Avenue, New York City, has issued a pamphlet describing its new "All Weather," Model A, 2½-gal., non-freezing fire extinguisher.

Water Heaters. — Ross Heater & Manufacturing Company, Inc., Buffalo, N. Y., manufacturer of heaters for boiler feed, etc., has issued catalog F, a thirty-nine-page booklet illustrating and describing various types of heaters, condensers, expansion joints, coolers and airjector pumps.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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Pay-Leave Fare Collection Appeals to Safety Engineer

STILL another advocate of the pay-leave plan of fare collection so successfully used on various electric railways has come to the front. It is none other than the local director of the National Safety Council in Kansas City, Mo., who is at present urging the abandonment of the Beeler plan of handling cars in the downtown districts of that city.

While we are not going to take sides with him in the question of handling traffic, we do feel that this is an opportune time for many electric railway operators to consider strongly that, by the pay-leave plan on outbound trips and the pay-enter plan on inbound trips, they can materially increase the track capacity and they will greatly benefit their patrons in enabling them to reach their destinations and homes more rapidly than when both directions of travel are handled strictly on the pay-enter plan.

Another Debt the Industry May Owe to Franklin

NEXT week is national Thrift Week, which begins on Jan. 17, Benjamin Franklin's birthday. The plan has received the approval of a number of national organizations, and the Governor of New York State has just issued a proclamation asking all citizens to observe the week in honor of Franklin, not by ceasing work, but by following his precepts on thrift; in fact, a movement is on foot to have each year a thrift week beginning on Jan. 17.

A campaign in favor of thrift can well be encouraged in this country, not on the theory that Americans have become greater spenders than formerly, but because a great deal of property was destroyed during the war and, broadly speaking, that amount will have to be replaced by savings before the credit and financial structure of the world will become normal again. The subject also is one closely related to the prosperity of the electric railways and the service which they can render to the public, because of the needs which the utilities have for additional funds each year to take care of their maturing obligations. Moreover, as was shown last week, this money will have to come largely from small investors, because with the present income tax laws, individuals and estates with large incomes are seriously penalized if they hold securities other than those which are tax exempt. The extent of this demand for investment funds by electric railways is indicated by a table of electric railway securities maturing during 1921, published in the *Wall Street Journal* last week. This table was included in the last issue of this paper and gave a total for electric railway bonds and notes maturing during 1921 of $207,617,530. Even if most of the savings from thrift campaigns do not go directly into utilities they will help their refinancing if they add to the amount of investment capital of the country.

Thrift campaigns should not be considered in any way to be antagonistic to campaigns urging people to relieve unemployment by purchasing articles. Money saved and invested is expended just as truly as if spent for luxuries, and its expenditure keeps employed an equal number of men. But there is this difference: It is spent for something productive and thus tends still further to increase the national wealth. Even purveyors of luxuries benefit from a thrift campaign, because ultimately it results in a larger group of possible buyers of the articles which they provide.

Many people do not realize how rapidly money reproduces itself, but in the thrift campaign for war savings stamps and others which have been conducted many interesting facts have been developed. Thus, it has been declared that if $7,000 and its proceeds had been kept continuously invested at 6 per cent from the time of the settlement of Jamestown until now the sum would be equal at the present day to the entire national wealth of this country, public and private. It will be remembered that Benjamin Franklin bequeathed a sum of money each to Boston and Philadelphia which was to be put at compound interest and then, with the accumulation, be put to the service of the public at the end of a century. While the actual amounts accumulated fell short of his calculations, the citizens of both cities are today enjoying the benefits of his forehandedness. If the memory and maxims of Benjamin Franklin will encourage efforts of this generation to thrift it may constitute another contribution by him to the electrical industry comparable with that which established the identity of lightning and electricity.

The Scrap Pile an Index of Progress

A REPRESENTATIVE of this paper asked one of the electric railway visitors from abroad last fall what most impressed him in regard to the operating practice of electric railway companies in this country. The visitor, who had made an extensive tour of inspection of different electric railway properties, promptly replied: "The size of their scrap piles." He then explained that he spoke both literally and figuratively and that what he had in mind was the amount of apparatus and equipment discarded as unfit for use by electric railway companies. Some of this was literally thrown on the scrap pile, but all was disposed of as scrap. In view of the more frugal practice observed by electric railway companies on the other side of the Atlantic, such a policy appeared to him to be almost criminal waste.

Much of this scrapping of material, in the opinion of the speaker, was due to lack of proper maintenance. Cars, for instance, would be used up in one-half or one-third of the time they would last abroad, principally because proper attention had not been paid to keeping up the paint and varnish and other protection. Still other cars which were in good condition would be discarded because "they were out of fashion." Equipment parts would be thrown on the scrap heap because no one seemed to think it worth while to rescue them, and so on down the list.

The fault of waste is one which is often charged against America, but is the practice just mentioned really waste? In fact, are not the enterprise and real efficiency and economy of our railway managements often gaged directly rather than inversely by the size of their "scrap heap"?

It may at first sight, for instance, seem wasteful to neglect the maintenance of a car body, but if there were perfect maintenance, car bodies would last indefinitely except for those destroyed by collisions. Yet car design is a progressive science, and if the physical life of a car body is longer or very much longer than its life as dictated by the existing status of car design, no great good is obtained.

Of course, the same principle applies to equipment parts and apparatus. There are doubtless instances where both have been scrapped too soon, but we believe the number of instances is far larger where they have been scrapped too late. This is especially the case with complete apparatus and equipment. On too many roads obsolete motors have been kept in operation long after they should have been thrown on the scrap pile because of their high maintenance cost and inefficiency. The wise manager is the one who knows the best time to throw away equipment and then acts upon his convictions. Some years ago this paper suggested as a slogan embodying the above principle the phrase, "Don't Build Cars to Last Forever." If cars are not built to last forever, obviously they and their component parts must be discarded some time.

Engineers' Program for 1921 Activities Promises Hard but Effective Work

THE members of the Engineering Association look to the subject committee each year to scan the field so closely as to permit the drawing up of a program which is comprehensive and interesting. The planning of this program is really one of the most important jobs of the association year. When it has been approved by the association and revised by the executive committee it forms a rather rigid guide for the committee work. The presumption that the topics selected are the most important ones for study is a fair one on the part of the committee members. They assume that if they carry out the assignments made to them they are doing their best work for the association. The list of 1921 assignments was printed in the Dec. 25 issue of this paper, page 1296, and its several sections ought to be studied carefully by the specialists in the respective fields.

In examining critically a list like this, one naturally takes the point of view of the committee members, who must do the assigned work and prepare acceptable reports. One asks, in this connection, is the work necessary and will it be inspiring? Most committee work is necessarily tedious; in fact one of its purposes is to relieve the industry as a whole from the task of collecting and digesting data, and similar duties. Hence it is natural to expect that the preparation of a report will be more or less of a "grind." But there should be some inspiration in it, too, if the best results are to be had. From these standpoints the 1921 assignments appear to be satisfactory. The numbers of topics in the several groups are not large, and in each there is at least one highly attractive topic. For example, the building and structures committee is to work on a shop layout; the equipment committee is to report on the life of wearing parts and related topics; the heavy traction committee is to compare the operation of locomotive and multiple-unit train operation; the power distribution committee will study wear of overhead contact conductors; the power generation committee will bring up to date the subject of the automatic substation, and the committee on way matters will consider substitutes for wood ties. There is also a new committee on apprentice systems which ought to stir up something at the next convention.

As the committees take up their work, it is appropriate that attention should be directed to the principles outlined above. The committees will need the co-operation of the entire industry in their researches. If the commissions which have been given to the committees are faithfully carried out, the 1921 convention of the Engineering Association will set a new high mark for excellence.

Connecticut Starts to Apply Federal Commission Findings

THE special report of the Connecticut Commission on the electric railway situation in Connecticut, of which an extended abstract was presented last week, shows that the commission has spared no effort to bring out the facts of the case and to apply to the local conditions the financial features of the recommendations of the Federal Electric Railways Commission. The commission has struck two ways. In its functions of securing for the public adequate service at reasonable rates, it admonishes the company in no uncertain terms. More strongly perhaps, it speaks to the public, or Legislature, in telling it what it must do in order to assure itself of the service at rates which it desires to pay and also in order adequately to pay for the service, provide for a return on the investment and assure credit upon which extensions and improvements may be based. Above all, it urges a spirit of co-operation, understanding and fair play.

An outstanding suggestion is to the federal court, to the effect that it restore the Connecticut Company to the New Haven road, which had originally created the property in a desire to link together in an economical operating unit the various transportation agencies of southern New England. That the community has not gained by this disintegration seems apparent to the commission.

To the company the commission recommends the sound policy of operation by independent divisions under competent local managers who have the necessary authority. It suggests the use of motor vehicles as substitute transportation on non-paying lines and as auxiliary to existing lines. It recommends increased publicity and suggests certain service improvements, which are probably sincerely desired by the company as well, as soon as its funds can support them.

To the public, the commission urges the abolition of many taxes and imposts, now proving a burden and reflected in poorer service and higher rates to the public. It suggests that legislation be enacted allowing the abandonment of unprofitable lines and permitting the railway company to operate motor vehicles. And most important, in this State of much jitney experience, it suggests that jitneys be made common carriers, subject to the control of the commission, except for certain safety and license rules of the State's motor vehicle department.

While the company's management may not care for some of the inferences and direct statements in the report and while the public may be slow to recognize the correctness of some of the admonitions directed its way, yet the report gives an impression of sound common sense. One is particularly struck by what might be called the commission's outstanding sanity in the question of valuation. While details of methods employed must be awaited before competent comments may be made, the logic of the commission in arriving at a conclusion at a cost of $10,000 as compared with a minimum estimated expense of $100,000 if the usual method has been followed seems unassailable, provided, of course, that an essentially correct result has been obtained.

Connecticut's new engineer-lawyer Governor, E. J. Lake, in an independent message, has closely paralleled the suggestions of the commission, in principle if not in detail.

It is, of course, too early to predict the form of any actual legislation which will result, but these recommendations in Connecticut, where electric railway and jitney troubles are serious, indicate both that there is action pointing toward constructive utility legislation, as has been anticipated in these columns, and that the report of the Federal Electric Railways Commission is taking effect in concrete form.

Educating the Man on the Job

TO GET the maximum efficiency from the men directly responsible for electric car maintenance requires that these men have a general knowledge of the functions which the various parts of the equipment are expected to perform and of the methods used in calculating and checking dimensions and adjustments. Most brake repair men will immediately concede the advantage of having the same shoe pressure on each pair of wheels during the braking period. In practice they find unequal shoe wear occurring continually, but if asked to check up their equipment and determine the pressure they are actually getting, few could do it. Such questions as the relation which unequal shoe clearance, excessive piston travel and high leverage bear to the frequency with which inspection and adjustment must be made will be better appreciated if the men can follow out some of the fundamental calculations of brake-rigging design on their own equipment. At first thought this problem may appear rather difficult, but a little consideration shows that in reality it is very simple and can be readily understood without the use of complicated mathematical formulas.

An article in this issue, which is the first of a series by H. M. P. Murphy, takes up some of the elemental considerations of brake-rigging calculations. Articles which are to follow will apply these to the most common types of brake rigging found on electric cars. These calculations are presented in a manner that can be readily understood by the average car repairman and should prove of educational value to the men most closely connected with the work if this information is made available to them. On account of the differences in car construction and weight there can be no fixed standard as to levers, but foremen and their assistants should be interested in informing themselves as to methods of making easy calculations. A little study and analysis will show many minor details in maintaining foundation brake rigging which would, if neglected, lead to serious accidents, or at least to a decrease in the efficiency of the braking equipment.

Customers' Notions Sometimes Make Supplies Cost More

THE contention of the standardization "fans" is that non-standard equipment will in the end cost more. If a reasonable number of companies adopt association standards this will prove true. There is a real drift or movement now in this direction. An element in the situation is the willingness of purchasers to suppress their desire for individuality for the good of the treasury.

Time was when every designer of electric railway apparatus wanted his designs to be different, thus stamping his individuality and personality upon his work. Not being quite satisfied with what he found ready to his hand, he got up something which he thought a little better. This of course was a special product for which his employer had to pay extra. This condition prevailed from a trolley hanger to a power plant.

This craving for individuality was opposed to manufacturing economy, often because the offender was not familiar with manufacturing processes. The present committee make-up of the Engineering Association, with railway and supply engineers on the same footing, is having an excellent effect, among others, in educating operating men as to these processes.

In last week's issue of this paper an article was printed which emphasized the above-mentioned point, but with regard to steel poles. It gave the manufacturer's point of view as to this important product. The careful reader was undoubtedly impressed by the fact that many considerations enter into the selection of details of design of steel poles, and other things, which are apt to be overlooked altogether. Presumably the salesman points these out when specifications are handed to him, but the salesman is hardly in a position to dictate or even urge a change in specifications when he is competing for an order. It is really up to the purchaser to know what he wants, and he ought to want what can be had most economically. In other words, the less notional he is the better.

Quotation from the Federal Electric Railways Commission Report

No. 3

ELECTRIC railways were not conservatively financed in their early years, and have not since made good their overcapitalization, except to a limited extent, otherwise than through the process of bankruptcy and reorganization. In the early days the promoters of electric railway properties believed that the long-term franchises with a 5-cent fare would be permanently profitable. Large sums of money were required to develop the business. In many cases the promoters issued bonus stock to represent money, service or property and added nothing to the value of the plant. As a result of this practice, there are many cases where the existing capitalization exceeds the investment in the plant or the value thereof, and there has been neglect to amortize this excess capitalization.

The Force Action of Brake Riggings

Most Common Forms of Levers Used in the Brake Rigging of Electric Cars Are Described and the Fundamental Laws of Leverage Are Worked Out and Applied to Practical Installations—By Solving Several Problems Involving the Forces Acting at the Various Points of Levers Those Interested Can Become More Familiar with the Subject

BY H. M. P. MURPHY

ELABORATE and costly experiments have been made to secure braking efficiency, braking power has been calculated to a nicety and everything possible has been done to insure proper installation of brake equipment, yet the results obtained ultimately depend on the thoroughness with which adjustments are made and the mechanical relations maintained. The most careful designing may be upset by such small items as the position of a brake lever, wrongly applied or missing cotter pins, holes worn oblong in brake levers, excessively worn brake lever pins or wrongly applied levers. Proper maintenance requires that careful attention be given to checking brake leverage, and foremen and their assistants should be posted on easy methods of making calculations. With this object in mind the editors of this paper have arranged for a series of articles on brake rigging design and calculation, the first of which is published herewith. The studies presented will be given in as simple and fundamental a manner as possible so that the whole subject may be more fully understood by the men actually doing the work. H. M. P. Murphy, the author, has had a long and varied experience in the calculation, installation and operation of braking systems with the pioneer company on brakes, the Westinghouse Air Brake Company, and the information which he presents should be of value to the mechanical departments of electric railways.

IN ALL brake systems economy and other practical considerations require that the force exerted by the brake-cylinder piston, or other source of power, be multiplied many times before being delivered to the brake shoes. Consequently the most important parts of any brake rigging are the devices which do the multiplying work and which are ordinarily simple levers or their equivalents. In dealing with this subject one of the fundamental requirements that must always be fulfilled in any satisfactory design is that each lever shall have only three independent parallel forces acting on it at the same time. If an attempt be made to cause four or more independent forces to act on a lever at the same time perfect equalization is no longer possible in practice and can only be obtained in part by the use of springs. On this account, and because the use of such devices offers no advantage whatever, the three-point lever has become the universal standard and is the only one that will be discussed here, although the same fundamental principles are applicable to all types of levers.

DEFINITION OF A LEVER

Whenever the generally accepted term "lever" is used it refers to a rigid bar, either straight or curved, which is so designed that it may be acted upon by three parallel forces in such a way as to produce a balance between them and to cause them to bear any desired relation to each other.

There are two kinds of three-point levers, namely, "straight line" and "eccentric." These will be taken up and described. The most common form of lever is a flat steel or iron bar, with three holes drilled in it in the same straight line, as shown in Fig. 1, the forces being transmitted by pins run through the holes and fastened in the jaws of rods or brackets. This type of lever is called the "straight-line" lever. At times a slight modification of the straight-line type of lever is employed, as illustrated in Fig. 2, one of the end holes being replaced by a semicircular notch or a curved bearing surface, as indicated. With this type a hooked jaw or a slotted head transmits the force to the end thus designed, instead of through a pin, as in the case shown in Fig. 1. Occasionally levers of the straight-line form are bent into various shapes in order to clear some obstruction. Such a lever is shown in Fig. 3.

The eccentric form of lever differs from the straight-line type only in that the three pin holes or bearing points are not in the same line, as illustrated in Fig. 4. This type of lever is not generally desirable from a practical point of view and should never be used when it is at all possible to avoid it. The object of bending a lever in this way is to provide clearance where necessary.

The simple principles or physical laws which govern the action of all levers, and similar force-multiplying devices, are in reality self-evident facts and therefore require no elaborate proof. Before stating these laws in a broad sense it will, however, be well to illustrate them by aid of a few elementary examples: Thus in Fig. 5 let a straight-line lever be suspended at the middle point by a cord passing over a pulley and suppose that the weight of the lever itself is neglected; then if a 100-lb weight be hung at one end, 20 in. from the central point, the lever will be balanced if another 100-lb. weight be hung on the opposite end at the same distance from the center end if two 100-lb. weights be attached to the cord.

Again, suppose that a 100-lb. weight is suspended on a lever, as in the previous case, at 20 in. from the central point. Now the lever may be perfectly balanced, as shown in Fig. 6, by hanging two 100-lb. weights on the opposite end at 10 in. from the central point (*i.e.*, at one-half of the single weight distance from the central point) and by attaching three 100-lb. weights to the cord.

As another example, suppose that a 100-lb. weight is suspended on a lever, as in the preceding cases, at 20 in. from the central point. Now the lever may be perfectly balanced, as shown in Fig. 7, by hanging four 100-lb. weights on the opposite end at 5 in. from the central point (*i.e.*, at one-fourth of the single weight distance from the central point) and by attaching five 100-lb. weights to the cord.

In any of these examples it is equally true that the same weights or forces will remain in balance if the lever be swung about the central point at any angle; thus, the same relations between the weights indicated in Fig. 6 will be maintained if the lever be swung at the angle shown in Fig. 8, the weights all acting vertically; that is, in parallel lines.

By an inspection of Figs. 5 to 8 it is seen that the two end forces acting on a lever are always exerted in the same direction, which is opposite to that of the central force. The examples illustrated also show that the middle force is always equal to the sum of the two end forces. Thus in Fig. 6 the middle force is 300 lb., which is equal to the sum of the two end forces of 200 and 100 lb. respectively, and either end force is equal to the middle force minus the other end force. Thus in Fig. 7 the force acting on the short arm is 400 lb., which is equal to the middle force of 500 lb. minus the other end force of 100 lb., or, the force acting on the long arm is 100 lb., which is equal to the central force of 500 lb. minus the opposite end force of 400 lb.

A FULCRUM IS DEFINED

In dealing with levers of any type or with other force-multiplying devices, such as locomotive bell cranks, it is customary to consider one of the three points or pin centers as the center about which the lever turns. A point thus considered is called the fulcrum. It is often thought that the fulcrum should be a fixed point, but this idea is entirely wrong. On the contrary, it should be emphasized that no matter what may be the duty of a lever or whether it has a fixed center or not any one of the three points (or pin centers) may be considered as the fulcrum. By remembering this important fact the problems of figuring leverage is reduced to one of extreme simplicity, and, as will be shown later, one single rule may be used for finding the forces acting on any lever.

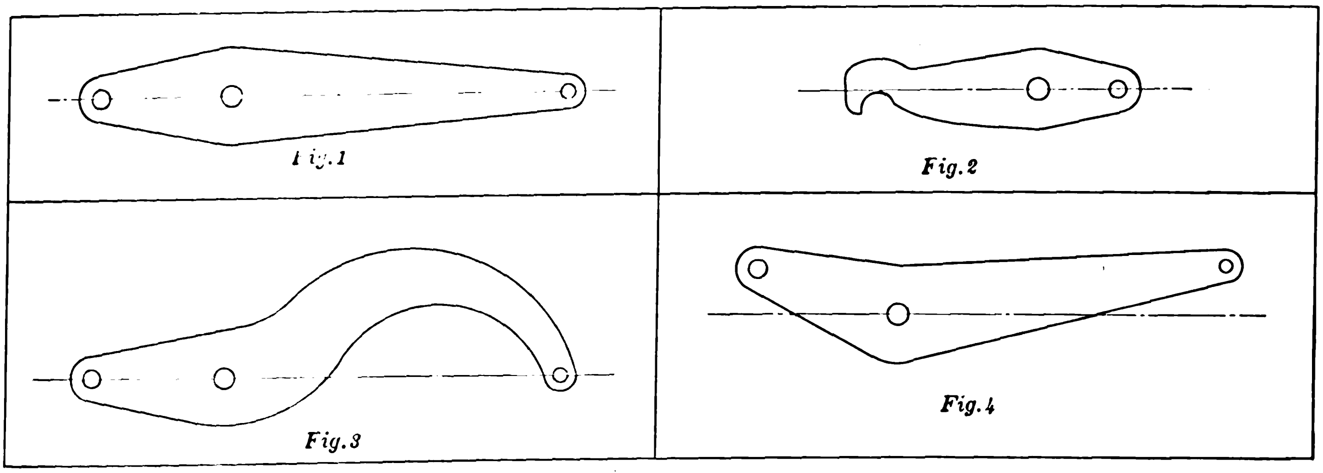


Fig.1 Fig.2 Fig.3 Fig.4

COMMON TYPES OF THREE-POINT LEVERS

Fig. 1—Straight-line type of lever. Fig. 2—Straight-line type with hooked jaw. Fig. 3—Straight-line type bent to provide clearance. Fig. 4—Eccentric type of lever.

In the case of any straight-line lever the distance between the point of application of a force and the point considered as the fulcrum is called the lever arm of the force in question. When any one of the three points of a lever is considered as a fulcrum the forces acting at the two other points are so related to each other and to their lever arms that the product obtained by multiplying either force by its own lever arm is always equal to the other force multiplied by its lever arm. Figs. 5, 6, 7 and 8 illustrate this. For example, in Fig. 6 or Fig. 8 consider the left-hand point of the lever as the fulcrum. Then by applying the law in question it is seen that the product obtained by multiplying the middle force, 300 lb., by its lever arm, 10 in., is 3,000, which is equal to the product of the right-hand end force, 100 lb., by its lever arm, 30 in.; or, in the same figures, consider the middle point of the lever as the fulcrum, then it is also seen that the given law applies, for 200 × 10 = 2,000, which is equal to 100 × 20 = 2,000; also, by considering the right-hand point of the lever as the fulcrum it is seen that the same law again applies, for 200 × 30 = 6,000, which is equal to 300 × 20 = 6,000.

FORCES DEVELOPED BY STRAIGHT-LINE LEVERS

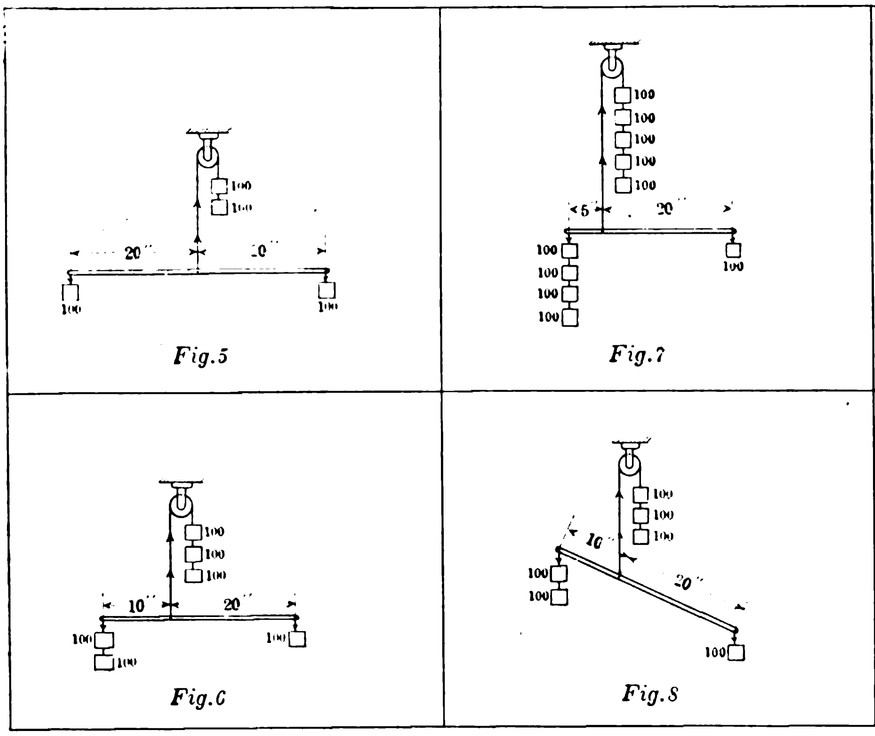
In order to obtain a direct method for determining the forces developed by any straight-line lever it is apparent that the law may be given as follows: If any one of the three points of a lever be considered as the fulcrum and if either one of the forces acting at the two other points be multiplied by its own lever arm and this product be divided by the lever arm of the second force the result obtained will be equal to the second force.

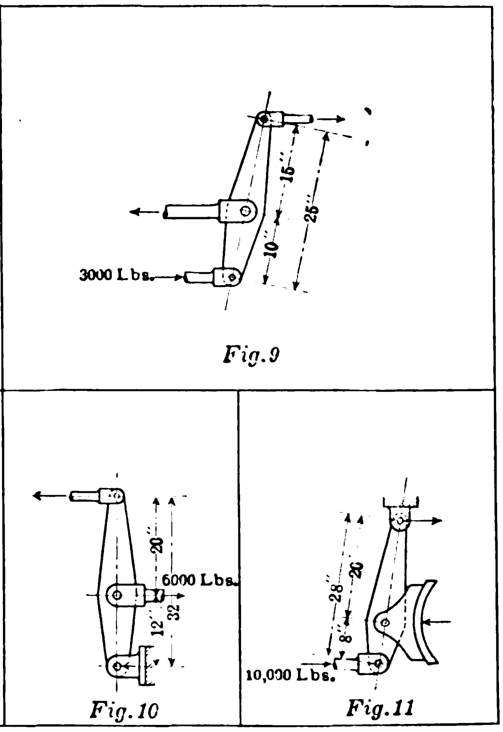
This method may be illustrated by Figs. 5, 6, 7 and 8. For example, consider the lever shown in Fig. 7 and suppose that the right-hand point is assumed to be the fulcrum. Then by multiplying the left-hand force, 400 lb., by its lever arm, 25 in., and dividing the product, 10,000, by the lever arm, 20 in., of the middle force the result is seen to be equal to 500 lb., the middle force. Similarly, if the middle force of 500 lb. be multiplied by its lever arm, 20 in., and if this product, 10,000, be divided by the lever arm, 25 in., of the left-hand force the result is seen to be equal to 400 lb.; that is, the left-hand force. Again, suppose that the middle point be considered as the fulcrum. Then if the right-hand force of 100 lb. be multiplied by its lever arm, 20 in., and if this product, 2,000, be divided by the lever arm, 5 in., of the left-hand force the result is seen to be equal to 400 lb.; that is, the left-hand force. Consequently it is clear that the truth of the law, or principle, under consideration holds for any case whatever, and, therefore, that in order to compute the forces acting on any three-point lever it is merely necessary to remember this law, which, for convenience, will be called the "leverage rule" and which may be restated in the following concise form: When the force applied at one point of a lever is known and it is desired to find the force developed at (*i.e.*, acting at) either one of the two other points consider the third (*i.e.*, remaining) point as the fulcrum. Then the desired force may be found by multiplying the known force by its own lever arm and by dividing this product by the lever arm of the desired force.

The lever point (or pin center), which is to be considered as the fulcrum in any specified case, is, of course, the point at which neither the known nor the desired forces act; that is, in order properly to select the "fulcrum" note the points of application of the known and desired forces. Then the third or remaining point should be considered as the fulcrum.

EXAMPLES OF THE LEVERAGE RULE

To illustrate the use of the leverage rule consider a lever of the type and size shown in Fig. 9. Suppose that a force of 3,000 lb. is applied at the lower end point as indicated and let it be required to find the force developed at the middle point. Consider the upper end point as the fulcrum. Then by the rule, which for simplicity may be expressed in the following mathematical form:





DIAGRAMS ILLUSTRATING LAWS OF LEVERAGE

Fig. 5—Lever suspended at middle point.
Fig. 6—Lever suspended at point with weight distances of ends in ratio of 1 to 2.
Fig. 7—Lever suspended at point with weight distances of ends in ratio of 1 to 4.
Fig. 8—Lever swung through an angle.

COMMON FORMS OF BRAKE LEVERS

Fig. 9—Live cylinder lever.
Fig. 10—Dead cylinder lever.
Fig. 11—Brake hanger lever.

The desired force =

$$\frac{\text{(the known force)} \times \text{(the lever arm of the known force)}}{\text{the lever arm of the desired force}}$$

As in this case the middle force is the desired force and the lower end force is the known force, and also as the lower end force = 3,000 lb., the lever arm of the lower end force = 25 in. and the lever arm of the middle force = 15 in., the mathematical calculation is obtained from:

$$\text{The middle force} = \frac{3{,}000 \times 25}{15} = 5{,}000 \text{ lb.}$$

In the same manner the force developed at the upper end point may be found by considering the middle point as the fulcrum, thus:

$$\text{The upper end force} = \frac{3{,}000 \times 10}{15} = 2{,}000 \text{ lb.}$$

Now as a check on these computations the two end forces added together must be exactly equal to the middle force. This is seen to be the case, for 3,000 + 2,000 = 5,000.

As a further example of this method of calculation consider a lever of the type and size shown in Fig. 10. Suppose that a force of 6,000 lb. is applied at the middle point, as indicated, and let it be required to find the force developed at the upper end point. To solve this problem consider the lower end point as the fulcrum and then, by the mathematical expression previously given:

The desired force =

$$\frac{\text{(the known force)} \times \text{(the lever arm of the known force)}}{\text{the lever arm of the desired force}}$$

$$\text{The upper end force} = \frac{6{,}000 \times 12}{32} = 2{,}250 \text{ lb.}$$

Also to find the force developed at the lower end point consider the upper end point as the fulcrum. Then by applying the rule,

$$\text{The lower end force} = \frac{6{,}000 \times 20}{32} = 3{,}750 \text{ lb.}$$

Now as a check on these computations the two end forces added together must be exactly equal to the middle force. This is seen to be the case, for 2,250 + 3,750 = 6,000.

A still different but similar application of this may be had by considering a lever of the type and size shown in Fig. 11. Suppose that a force of 10,000 lb. is applied at the lower end point, as indicated, and let it be required to find the force developed at the upper end point.

Consider the middle point as the fulcrum. Then by applying the mathematical rule previously given:

$$\text{The upper end force} = \frac{10{,}000 \times 8}{20} = 4{,}000 \text{ lb.}$$

Also to find the force developed at the middle point consider the upper end point as the fulcrum. Then:

$$\text{The middle force} = \frac{10{,}000 \times 28}{20} = 14{,}000 \text{ lb.}$$

Now as a check on these computations the two end forces added together must be exactly equal to the middle force. This is seen to be the case, for 10,000 + 4,000 = 14,000.

IMPORTANT FACTS CONNECTED WITH THE USE OF THE LEVERAGE RULE

The important facts which have been illustrated by the preceding examples may be summarized as follows: First, any one of the three points or pin centers of a lever may be considered as the fulcrum whether there is a fixed point or not; second, in the computation of one of the two unknown forces acting on a lever the point at which the other unknown force acts must be considered as the fulcrum, and, third, each of the unknown forces acting on a lever may be found by aid of the "leverage rule," providing that the point considered as the fulcrum is properly selected in each case and that the lever arms of the desired and known forces are correctly measured in accordance with the fact that for straight-line levers the lever arm of any force is the distance between the point of application of the force and the point considered as the fulcrum.

It is now evident that by remembering the simple but general "leverage rule" and the true significance of the terms "lever arm" and "fulcrum" the forces developed in any standard form of brake rigging may be easily computed, for all of such systems are composed of a series of simple levers connected by suitable means, such as tie rods, etc., for transmitting the forces concerned. The usual method of procedure employed in the solution of brake rigging leverage problems will be fully explained in the following articles.

The Inspection of Rail Bonding

Inspectors Must Make Certain that All Joints Are Bonded, that Proper Types of Bonds Are Used, that Rails Are in Proper Condition for Bonding and that the Work Is Done Satisfactorily —Analysis of the Methods to Be Employed to Achieve the Desired Results

BY G. H. McKELWAY
Engineer of Distribution Brooklyn (N. Y.) Rapid Transit Company

NO MATTER how good a rail bond may be immediately after installation, there is no type that can be relied upon to remain in good condition indefinitely. It is therefore important that they be inspected and tested periodically in order that those that deteriorate may be removed and be replaced with good ones. Some railway companies, particularly those whose tracks are laid and bonded by contractors, have inspectors on the work during the time of installation to see that the bonds are applied properly and also have tests of the bonds made as soon as they are installed. Where concealed bonds are being installed by contract such inspectors are often needed to make certain that the bonds are installed at all. Even if the contractors in charge of the work are entirely honest and furnish enough bonds for all joints, yet the men whose duty it is actually to install the bonds may not put all of them in, either through carelessness, laziness or dishonesty.

The first duty, and the most obvious one, of such an inspector therefore is to see that all of the joints are bonded. The next is to see that the proper type and length of bond is used, and then to make sure that all bonds are applied in such a manner as to make good contact with the rail and to insure that they will remain in good condition as long as possible.

First the rail should be properly prepared to receive the bond terminal. If expanded terminal bonds are to be employed holes of the proper size should be drilled in the rail at the proper height and the right distance apart. The height of the hole may seem unimportant, but if it is not in just the right place the bonds may be pinched between the splice plate and the web of the rail where the bonds are installed under the plates. At best there is very little room for the bonds under many of the plates, and a slight variation in the location of the bond may easily place it where the joint plate will squeeze it when the bolts are drawn up tight. The holes themselves should be drilled with well-sharpened bits so that the metal will be cut out cleanly and not torn out raggedly so as to leave burrs in the hole.

The question as to whether or not any lubricant should be used when making the holes is still an open one, although it has been debated for many years. The consensus of opinion seems to be that it is safe to use a lubricant if proper precautions are taken to insure its removal after the drilling has been finished. But the supporters of the use of a lubricant are divided as to whether plain water, soda water or oil should be used.

MOISTURE WILL CAUSE RUST

The objection to the use of water is that any moisture left in the hole will cause rust, which is an insulator. The contact between the terminal and the sides of the hole is imperfect and the resistance is increased not only at the point where the original rusting occurred but utlimately at other points to which the corrosion may extend. Oil is also an insulator, but it is claimed that all but a very thin film of it will be pushed out of the hole when the bond terminal is inserted and expanded. The excess oil, however, when driven out of the hole will gather around the edges and will stay between the head and button of the terminal and the web of the rail, thus reducing the conductance between those parts. To make a really good job all of the water or oil should be wiped off before the bonds are installed and this is too much to expect from the ordinary class of bonding labor in the field, so that the safest way is to drill the holes dry.

Not only must the inspector be on guard against any moisture that might be introduced into the hole during the act of drilling, but precautions should be taken to make certain that no dampness from the atmosphere or from any other source may enter later. To this end no bonding should be done during rainy weather, and even on clear days the bonds should be installed in the holes as soon as possible after the latter have been drilled. When holes are drilled on one day and the bonds are not installed until the next it is sometimes the practice to plug the holes with paper to exclude the dampness. This is better than nothing, but the best plan is to run a reamer through the holes the next morning, taking off only enough metal from the sides of the holes to be sure of removing any corrosion that may be present.

After the terminals have been placed in the holes the inspector should satisfy himself that they have been sufficiently expanded. With tubular terminals there is little to watch except to see that the taper punch is used in accordance with the instructions and that the drift pins are driven home. In the installation of compressed terminal bonds the compressors must be in good condition, well greased, and with screw threads, pins or cups unbroken and well centered in the bond terminals, and sufficient force must be exerted by the bonders to make sure that the bonds are well compressed. Where hydraulic compressors are used it is much easier to obtain satisfactory compression than with the screw type, as the former do not require the bonders to exert as much strength in their operation as do the latter.

The screw compressors are generally used on all but large jobs because of their low first cost and lighter weight. If the screw compressors are well made and operated they can turn out as satisfactory work as the hydraulic type and will compress just as much. That this is true will surprise many persons, but it was proved by a competitive test made by a large railway company a few years ago. The saying of Archimedes, that given a lever long enough he could move the world, can be adapted to the screw type of compressor. By using a long enough wrench and particularly if a ratchet wrench is used, so that it can be made to take hold of the screw at the angle best suited for the application of power by the men operating it, sufficient power can be supplied to give any compression needed. In fact, that can be furnished by two husky men on the end of the ordinary wrench if they are only willing to work hard.

POLISHING INSURES GOOD CONTACT

Another point that is always recommended but which is seldom carried out in practice is the polishing of the bond terminals with emery cloth before they are installed in the holes. This polishing is to make sure of good contact between a clean, bright terminal and the clean sides of the hole. Mercury amalgam is occasionally used to make a still better contact, but, although there is a very slight improvement in the contact resistance at the beginning, this is only temporary and the contact cannot be relied on permanently to improve the bonding.

Where soldered bonds are installed the inspector should see that the portion of the rail to be covered by the terminal has been carefully polished, that the terminals are placed on the polished portions of the rail and not partly on the smooth and partly on the rough metal and that the rail and the terminal are sufficiently heated before the solder is applied to them. The rail should be tinned before the bond is clamped in place, and this cannot be done well unless the blow torch has been playing on it for some time. It is easy to heat the terminal thoroughly after it has been put in place, but owing to the much greater amount of metal in the rail and the ease with which the heat is conducted away from the point where it is applied there is always danger that the solder will adhere closely to the terminal but not to the rail and that a poor job will result.

With the various types of welded bonds the same precautions must be taken as with soldered bonds except that there is no necessity for preheating the rail. When a welding car is used, after the welding has been begun it is only necessary to see that the proper pressure is applied to the bond and that the current is kept on for the right length of time. When the bonds are applied by the arc-weld process the operation is not so mechanical and the type and length of the arc, as well as the method of depositing the molten metal, must be watched.

When special work is to be bonded with cable jumpers not only the connections between the terminals and the rail should be inspected but also the connections between the various wires and between the bonding wires and the sections of bonds running to individual pieces of the special track work as well. The inspector should make sure that the splices in these wires are not only well wrapped but also carefully soldered, for unless the work is carefully supervised there will be attempts to make some if not all of these connections with "dry splices," using no solder at all.

TESTING FOLLOWS INSPECTION

After the installation of the bonds has been completed tests should be made to insure that they have been put on properly and are fulfilling the requirements specified. With the welded and soldered bonds these tests are often made by purely mechanical means, the terminals of the bonds are kicked or struck a light blow with a hammer to see that they cannot be easily knocked off. A variation of this method is to slip a bar through the loop of the bond and to use that as a lever in an attempt to pry the bond from the rail. In order that enough but not too much strain may be thrown on the bond it is well to specify the length of the bar to be used and to have the pull exerted at the specified height through a spring balance to measure the amount of the force applied. It is also customary with some companies to pull off a certain percentage of the bonds and examine the terminals to see the extent of the contact made between them and the rails. These few bonds are taken at random and therefore are supposed to represent the average conditions of the whole lot of bonds that are installed.

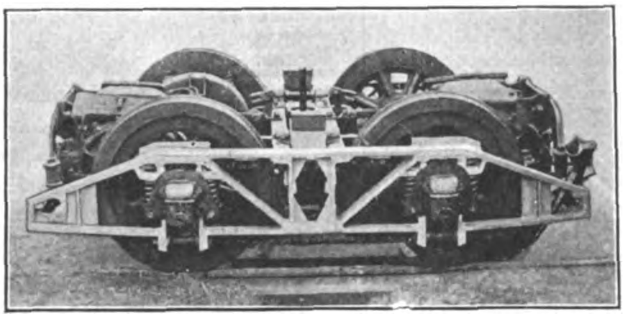
Mechanical testing will serve no good purpose with the expanded terminal bonds, and although visual inspection will show a few things, such as whether or not the compressor was properly centered on the bond, whether the button was formed properly, and whether any splitting of the terminal took place, yet that is about all, and there is no way, except by testing electrically, to make certain as to the quality of the contact made. As was mentioned by the writer in a previous article, it is extremely doubtful whether electrical tests of recently completed bonding are of any value except to show up bonds that have been very poorly installed or to locate joints where no bonds at all have been placed. The contact resistance between the joint plates and the webs of the rails is so low when the tracks have just been laid and until a film of rust has had time to form between them that a much greater proportion of the current is at first carried by the plates than is the case later, and therefore the bonds appear to be in better condition than they really are. Later tests, however, will produce the desired results.

Arc Welding on Railway Properties*

The Convenience and Economy Resulting from Electric Welding Are Now Recognized Quite Universally by All Railways—New Uses and Practices Are Coming to Light Continually—Some Important Details of the Science of Electric Welding and the Results Obtained Are Related—New Applications for Arc Welding Are Also Pointed Out

BY A. M. CANDY
Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

THREE views of three different truck frames which are entirely welded, no rivets being used in their construction, are shown in Fig. 1. This is a practice now being used to a certain extent by the Government Electric Railways of Sydney, Australia. The journal boxes used with these trucks are also made up completely by welding. Another interesting use of arc welding on this property is in making gear cases, as pictured in Fig 2. It will be observed that not only is the shell of the gear case welded but also the reinforcing strips on the sides. The latter are welded by what is known as the plug welding method, wherein metal is deposited in small holes drilled through the outer plate. These places can be identified by the rough approximately circular spots at various locations over these reinforcing plates. A somewhat similar method of welding gear cases is used by some of the large manufacturers here.



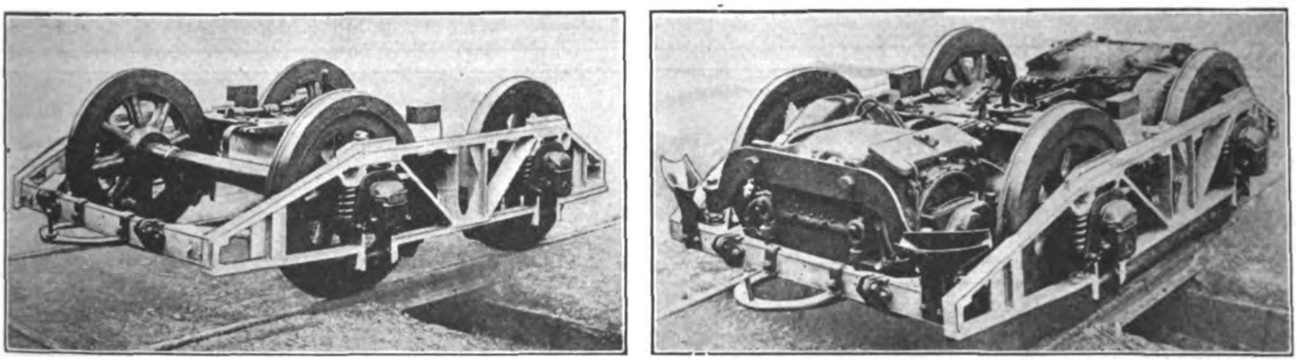


FIG. 1—ALL-WELDED STREET RAILWAY TRUCK USED BY THE GOVERNMENT RAILWAYS, SYDNEY, AUSTRALIA

Fig. 3 shows the bottom of a welded steel transformer tank, which is a good illustration of a welding job that can be done more satisfactorily by the arc process than by the gas process for the following reason: If the gas flame is played against the center of the Z-bars in order to bring them to a welding temperature for welding the bracing strips the bars will become so badly heated that they will buckle up in the center, making it practically impossible to do a satisfactory job. In the case of the arc process the arc heat is so concentrated and the weld can be made so rapidly that the entire joints between the Z-bars and the bracing strips can be made without throwing the Z-bars out of alignment appreciably. This close-up view of the bottom seam shows how uniformly a good operator can put down the deposited metal. Incidentally, this entire case was welded by an operator who had been using the oxy-acetylene welding process for years, but who had only two weeks' training previous to building this particular arc-welded tank.

Fig. 4 shows the method used by one of the pressed steel car builders for attaching the felt lining for the inside of a car body. The positive side of the welding circuit is attached to the car body and the operator, using a pair of pliers connected to the negative side of the circuit, grips finishing nails in the pliers so that he can touch the head of each nail against the side of the car sheeting, drawing an arc. He then pushes the nail into the molten metal thus formed and releases the pliers, leaving the nail attached to the plate as indicated. The felt lining is then pressed down over these nails, after which small circular disks of tin, such as are used for fastening tar paper roofing, are pressed down over the nails. After this has been done the nails are clinched over to hold the lining in position.

In Fig. 5 is illustrated a very neat and satisfactory way of building up the worn surfaces of a standard coupler knuckle. A number of steam railroads are following this practice.

EXPERIENCE IN WELDING UNDERSIZE MOTOR SHAFTS

If undersize motor shafts are reclaimed by welding and turning down to proper size it would appear from superficial observations that this practice is satisfactory. However, if the shaft is cut through the deposited section, as illustrated by Fig. 6, and the section is ground, polished and etched it will be found that the deposited

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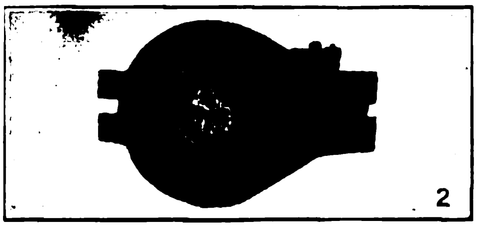
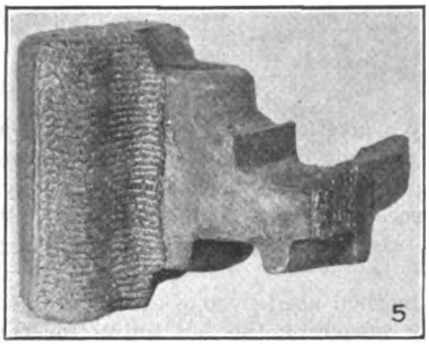
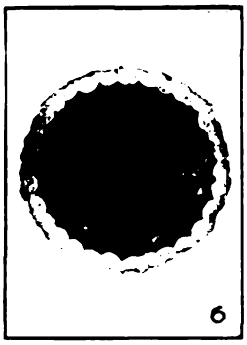
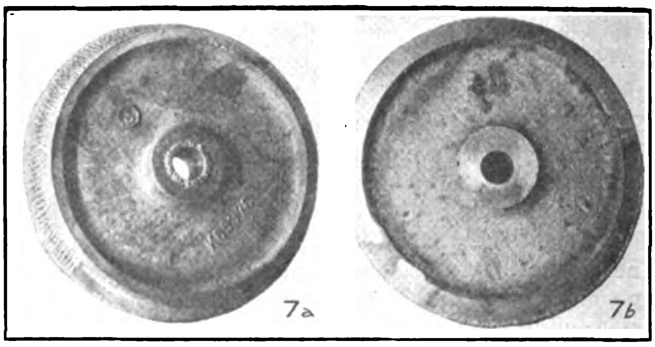
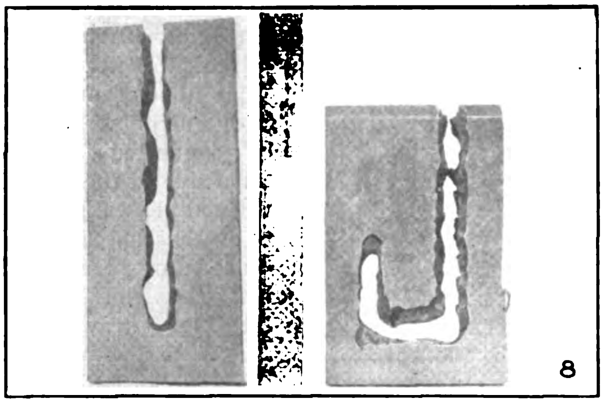
*Abstract of address made before Association of Railway Men, Mansfield, Ohio, Dec. 7, 1920.

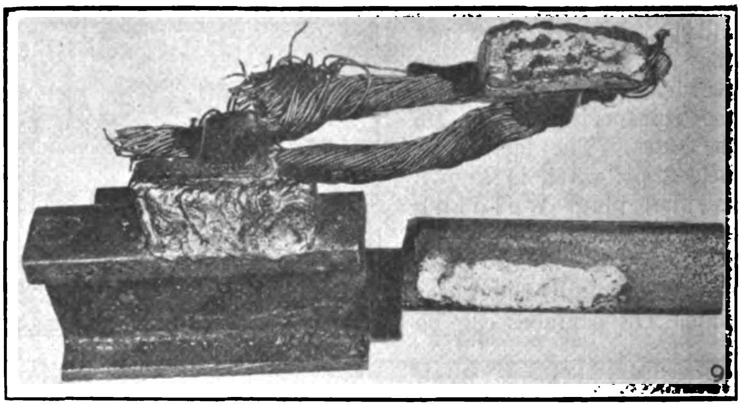


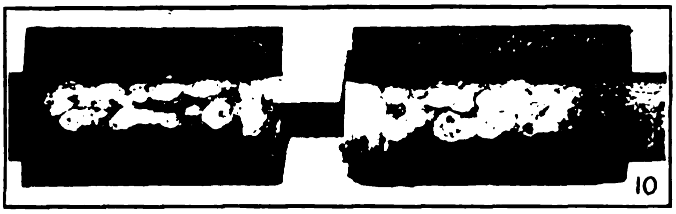


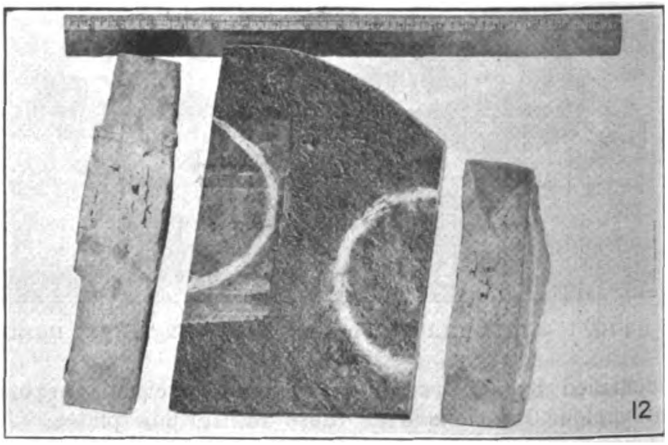


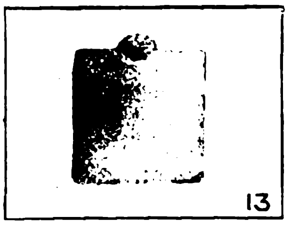


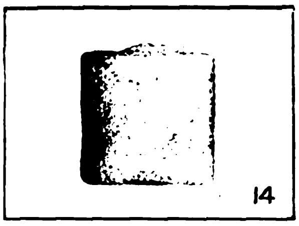


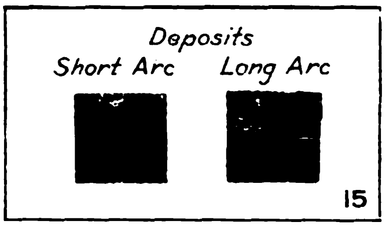












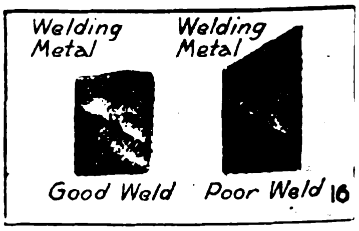


Fig. 2—Method of welding gear cases used by Sydney, Australia, electric railways.

Fig. 3—Bottom welding on a steel transformer tank, where arc welding surpasses gas welding.

Fig. 4—Welding finishing nails head-on to car sizing for attaching felt lining.

Fig. 5—Manner of reclaiming worn coupler head by arc welding.

Fig. 6—Section through built-up armature shaft, showing blowholes and change in crystalline structure.

Fig. 7—Two views of car wheel on which the flange has been built in thirds by welding.

Fig. 8—Cutting cast iron (left) and steel plate (right) by means of the electric arc, using the graphite electrode process.

Fig. 9—Arc welded bond tested for strength. Right-hand terminal indicates thorough weld resulting from weld made with rail positive and electrode negative.

Fig. 10—Appearance of rail surface from which arc-welded bond has been sheared. Weld was made with rail negative and electrode positive.

Fig. 11—The depth of crater and the overlap of deposited metal form an index of the depth of penetration of the weld.

Fig. 12—Two welds on cast steel; left-hand weld was made with metallic electrode, whereas right-hand weld was made with graphite electrode process.

Fig. 13—Polished and etched section through metal deposited by using a short arc.

Fig. 14—Polished and etched section through metal deposited by using a long arc.

Fig. 15—Surface appearance of welds made with short arc (left) and with long arc (right).

Fig. 16—Section through two welds, showing effect of current value. Too low current was used in right-hand piece.

metal, which is practically pure iron in cast form, contains a certain amount of blowholes. Furthermore, the heat of the arc and of the deposited metal has raised the temperature of the shaft metal adjacent thereto to a sufficiently high value so that when it is cooled rapidly the crystalline structure is changed. This metal is chilled rapidly both by heat which is conducted into the central portion of the steel shafting, which is at a relative low temperature, and by radiation through the deposited metal to the air. The result is a chilled section of steel shafting which is relatively brittle. A subsequent heat treatment will bring back all of the shaft material to its original crystalline structure, but no amount of heat treatment will change the characteristics of the deposited metal by any very appreciable degree, due to the fact that it is cast material and contains practically no carbon.

TAPERED FITS ARE BUILT UP ECONOMICALLY

For these reasons we do not ordinarily recommend building up of heat-treated steel shafting at points where severe strains take place. There are cases, however, where this is entirely permissible; for example, in building up the tapered fit for a gear pinion or the threaded end of a shaft for re-turning to accommodate a nut for securing the pinion. We have also used this process for extending some shafts used on cranes in our own shops with very good results. However, there are cases where the severe vibration and alternating stresses set up in the shaft will make it absolutely inadvisable to apply the welding process.

Fig. 7 illustrates a built-up flange and bore of a car wheel. Approximately one-third of the flange was left in its original state, another third at the right was welded and then turned down, after which the left-hand third was built up and left as finished from the welding operation. The reverse side of this same wheel is also shown in Fig. 7. By the discoloration seen in the lower right hand one-third portion of the wheel it is obvious that the heat of the welding arc and the deposited metal have changed the structure of the wheel materials. The use of this practice is therefore of very questionable value, especially where high speed service is encountered. For city service, however, I believe this practice would prove satisfactory and if properly handled would be often found more enomical than the use of a new wheel or turning the wheels down to re-establish the proper contour.

The welding of small cast-iron sections presents special problems. The deposited metal is soft, as is also the cast iron, but the metal at the zone of union between the cast iron and the deposit, representing a skin of approximately $\frac{1}{32}$ to $\frac{1}{16}$ in. in thickness, will be very hard. This is because the pure iron deposited by the metallic electrode absorbs some of the free carbon, known as graphitic carbon, from the cast iron and is chilled due to the heat flow into the cast iron and also radiation to the air. This therefore forms a shell of high carbon cast steel which is very hard and can only be eliminated by either preheating the cast iron before the welding work is done or else annealing the casting after the welding is finished. Where the material can be finished by grinding it is unnecesary to get rid of the hard zone. But if machine work must be done in the region of the zone of fusion it is necessary to have this hard shell eliminated.

The electric arc can be used effectively for cutting purposes. Fig. 8 shows two samples of cutting by the graphite electrode process. The sample at the left is a piece of cast iron 1½ in. thick, which was cut for a length of approximately 10 in. in three minutes, using a current of 400 amp. This is at the rate of 16½ ft. per hour. The sample at the right is a piece of steel plate 1 in. thick which was cut using a 400 amp current, the length of the cut being approximately 13 in. It was made in three minutes, or at the rate of 21½ ft. per hour.

Fig. 9 shows a test sample of electrically welded rail bond, the weld having been made with the bond connected as the negative electrode and the rail as positive. The sections of rails which were available were not sufficiently large to permit welding the bond in its proper position on the side of the head, and therefore it was welded on the face of the head. This bond was tested for strength in an Olsen testing machine by gripping the two pieces of rail in the jaws of the machine. The test results are as follows:

One of the twin cables pulled out of each terminal at 1,350 lb. The left-hand copper terminal was then given a shearing stress by compressing it, the compressing pressure being 11,200 lb., when it commenced to shear from the deposited metal. The deposited material of the right-hand terminal was sheared from the rail by a pressure of 34,000 lb. By observing the light portion shown on the head of the rail it is evident that a very good job of welding was secured, giving a very thorough fusion.

Fig. 10 shows the results obtained using the welding polarity obtained by making the rail negative and the electrode positive, as in ordinary service where welding current is obtained from the overhead trolley wire working through a resistance to the electrode. These samples were also pulled in the Olsen machine and given a shearing test with the following results:

The cables pulled out of the terminals at 5,520 lb. The weld metal sheared from the left-hand rail section at a pressure of 29,580 lb., and from the right-hand rail section at 17,400 lb. The "spotty" appearance of the weld surface from which the bond has been sheared indicates that the fusion of the metals was not complete. This appearance in Fig. 10 is compared with that in Fig. 9.

HOW TO INSPECT A WELD

Fig. 11 shows the results obtained when making a deposit upon a strip of steel plate by using a $\frac{3}{16}$-in. diameter electrode and a current of 350 amp. This also shows how the depth of the penetration of the deposited metal, indicated by the section of the two center pieces, can be judged from the depth of the crater appearing both in the right-hand piece and at the three places on the left-hand piece. By observing these characteristics, together with the overlap of the deposited metal at its edges, the operator can very readily judge the satisfactoriness of the deposit relative to a weld of desirable strength.

Fig. 12 illustrates polished and etched sections through welds made in a steel casting, that at the left having been made using a $\frac{3}{8}$-in. diameter metallic electrode and 400 amp., whereas the right-hand weld was made using the graphite electrode process. The same metallic electrode material was used as filler metal and the same current in both cases. When using large metallic electrodes or the graphite electrode process the operator is very likely to have a considerable amount of slag inclusion, as indicated by the sections. Therefore we do not ordinarily recommend these processes except where the speed of doing the work is of more importance than strength of the weld. In the case of the left-hand metallic electrode weld the metal was deposited at the rate of approximately 3⅓ lb. per hour, whereas in the right-hand weld made by the graphite electrode process the metal was deposited at the rate of approximately 3.43 lb. per hour. The size of the parts can be judged from the rule, which is shown immediately above the pieces.

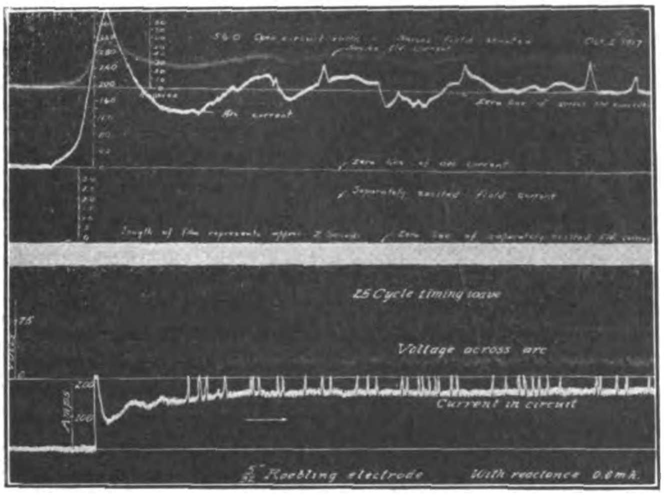


FIG. 17—GRAPHS COMPARING RESULTS WITH AND WITHOUT REACTOR. AT TOP, NO REACTOR IN CIRCUIT AT BOTTOM, REACTOR USED

For test purposes a 14-lb. deposit approximately 4 in. wide, 2 in. thick and 12 in. long made on a piece of ⅜-in. steel by using 5/32-in. diameter electrode and 160 amp. of current was made. This was ground, polished and etched and it could then be seen that very little slag or oxide inclusions were present. Therefore where a weld of maximum strength is desired we usually recommend the use of smaller size electrodes, namely, 5/32 to 3/16 in. in diameter maximum, and a current of from 160 amp. for the smaller to 225 amp. for the larger electrode.

Test samples in the shape of a small shaft with a threaded head at each end were then turned up from the metal in the 14-lb. deposit. The tests on these pieces of solid deposited metal showed the following characteristics:

Ultimate tensile strength, 58,225 lb. for one piece and 56,075 lb. for another, the yield point being 35,875 lb.; elastic limit 29,000 lb., per cent elongation in 2 in., 16 for one and 18 for the other; per cent reduction of area, 23.4 for one and 27.8 for the other.

LENGTH OF ARC AND PROPER CURRENT VALUE

Fig. 13 shows a polished and etched section through a deposit made with ⅛ in., 22-volt arc on a piece of 1-in. x 1-in. steel. The depth of penetration of the deposited metal and the concentration of this material are evident. Fig. 14 shows a similarly prepared section through a deposit made with a long arc. In the case of the long arc the air drafts which are always present cause the arc to play about over the surface of the work, scattering the metal around and causing a great deal of porosity. It will be observed in Fig. 14 that the deposited metal has not penetrated into the steel piece to any extent and that it is scattered over a considerable area. Fig. 15 shows the plan view of these same two pieces, showing the metal deposited by the short arc at the left to be very smooth and relatively free from porosity and oxidation, whereas the metal deposited by the long arc at the right is very porous, poor material and is scattered over a considerable area.

Fig. 16 illustrates the importance of using a sufficiently high current to obtain good fusion between the deposited metal and the part being welded. The sample at the right was made with too low a current value, so that the deposited metal pulled away from the surface very readily, as indicated at the top edge. The left-hand sample was made with a sufficiently high current. When tested it broke through the center of the weld, where it would be expected to break, owing to the fact that the entire section was machined down to a uniform thickness. The deposited metal is cast material and hence would break before the parts welded, which were mild rolled steel.

The use of a reactor or inductance coil in each metallic electrode circuit is recommended. The advantages of the reactor are that it makes it easier for the operator to strike his arc and also gives the arc additional stability. This is of especial value if the steel upon which the operator must do his welding work contains foreign matter, such as grease, absorbed gas, rust or other foreign substances, which under the heat of the arc will form gas, tending to blowholes in the molten metal. The electromagnetic energy stored in this reactor gives the arc additional stability. When the operator strikes his arc the reactor keeps the current from building up to such a high value as to cause the electrode to stick or freeze to the work.

In Fig. 17 is shown in curve form the result of using a reactor. The upper curve was taken with a welding circuit having no reactor connected therein. Below is illustrated the effect of the reactance in the same welding circuit, without changing any other conditions except connecting in the reactor in series with the welding resistance.

Moving Platforms for Crosstown Lines

Consulting Engineers Outline a Solution of the Crosstown Traffic Problem by Using Moving Platforms Propelled by the Electric Carrier System—Details of the Proposed Platforms Are Given

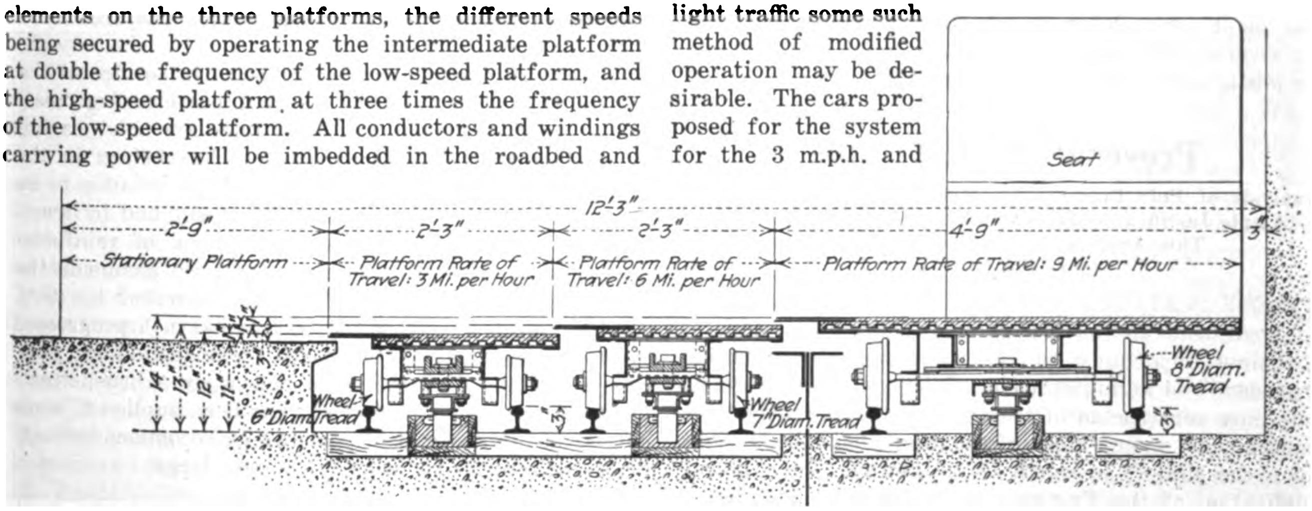
AT THE meeting on Nov. 17 of the New York section of the American Society of Civil Engineers L. B. Stillwell of the firm of Stillwell & Putnam, consulting engineers, presented a paper briefly describing a moving platform to handle crosstown traffic on Fourteenth, Forty-second and Fifty-seventh streets. Since the publication of the abstract of this paper in the ELECTRIC RAILWAY JOURNAL of Nov. 27, 1920, on page 1102, more detailed information has become available about the design and the means of propulsion of the moving platform.

As early as May 15, 1902, moving platforms were proposed to the former Rapid Transit Commission by the then Commissioner of Bridges, Gustav Lindenthal, who wished to install such equipment on the Brooklyn Bridge. The Public Service Commission, however, having succeeded the Rapid Transit Commission, declined to approve Gustav Lindenthal's plan. Several times since propositions to install moving platform subways on the more important crosstown routes have been laid before the traction companies and the Public Service Commission, only to meet with an unyielding opposition. Now further public efforts have been induced by the inadequacy of the shuttle train service in the Forty-second

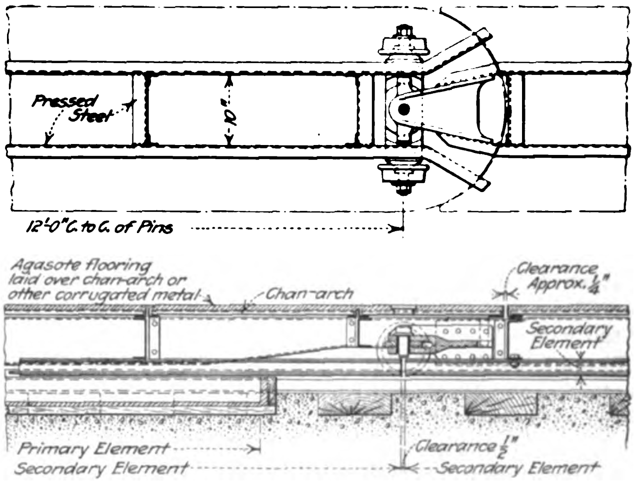
Street subway, and certain legislative changes in the Public Service Commission afford an opportunity which will permit serious consideration of a method offering a solution for the relief of congested crosstown traffic.

In the report on this subject by the engineers recommending the new plan the success of previously proposed methods where the platform is carried on rollers, mounted on shafts which are driven by stationary motors, is doubted because of inherent mechanical difficulties. The electric carrier system of propulsion will permit the use of platforms mounted on car trucks, which will effect a material reduction in the cost of construction, operation and maintenance, and also of the space required. The distinguishing characteristic of this system is the method of propulsion. Instead of a complete motor being mounted upon the car and transmitting mechanical power therefrom through gears to the wheel, or driving carrier wheels on which the platform moves, the three-phase induction motor of the squirrel-cage type is used. These parts are separated, that corresponding to the stationary or primary element of the motor being straightened out into sections about 5 ft. long and placed midway between the rails in the roadbed, while that corresponding to the revolving element, also straightened out, forms a continuous short-circuited secondary mounted on the bottom of the car. The primary elements, when energized with three-phase current by induction, magnetize the short-circuited secondary which extends continuously along the bottom of the car. The result is that the force created between the induced secondary current and the shifting field of the primary propels the car.

The scheme proposed is to use three platforms of 27 in., 27 in. and 57 in. width, respectively, moving at 3, 6 and 9 m.p.h. The high-speed platform carries seats for two persons spaced at 3-ft. intervals. It is proposed to use identical construction for the electrical elements on the three platforms, the different speeds being secured by operating the intermediate platform at double the frequency of the low-speed platform, and the high-speed platform at three times the frequency of the low-speed platform. All conductors and windings carrying power will be imbedded in the roadbed and thoroughly protected and insulated against damage by water in a manner to make accidental contact and danger very remote. The current will be carried at relatively high potential to transformers located at points along the system and thence by cables in ducts to the primary element between the rails. The primary element, as explained, is not continuous, but will be installed at intervals in sections about 5 ft. long. In the case of the 3 m.p.h. platform the primaries will be approximately 400 ft. apart, in the case of 6 m.p.h. platforms 200 ft. and in the case of the 9 m.p.h. platform 60 ft. apart. Each primary element will produce a pull equivalent to a 1½ to 2-hp. motor. The secondary, consisting of copper punchings imbedded in the lamination, is continuous except for a ½ in. break between cars.



CROSS SECTION OF SUBWAY SHOWING ASSEMBLY OF PLATFORMS



PLAN AND LONGITUDINAL SECTION SHOWING MOVING PLATFORM DESIGN

The power supply will be produced by a motor generator set, in which a single motor will drive three generators mounted on a single shaft. The generators will produce three-phase alternating current at 10, 20 and 30 cycles respectively or some multiple of these frequencies. As the speed of the different platforms depends on the frequency of the three-phase current applied to the primary, it is clear that any platform may be operated at a lower speed by changing the frequency supplied to it, in case it should be desired to shut down one platform and operate the other two, or in case one platform only is to be operated. During periods of light traffic some such method of modified operation may be desirable. The cars proposed for the system for the 3 m.p.h. and 6 m.p.h. elements will be about 12 ft. long and 28 in. wide, constructed from channels which support a pressed-steel platform covered with 1½-in. agasote, giving a light and non-slippery surface. Each car is supported by a pair of wheels and coupled at the rear by a kingpin to a similar pair of wheels on the car immediately following. The two slower-speed elements run on a track of 18-in. gage, while the gage of the track for its 9 m.p.h. platform is 32 in. Axle friction on curves will be minimized by the use of roller bearings for the wheels. Friction and wear can still further be reduced by keeping the track well greased on curves and on tangents, since magnetic pull and not the adhesion of the wheels to the track is used for propulsion. The resulting low rail and wheel wear will reduce the extent of the adjustments required to maintain the standard air gap, but such adjustments can easily be made when necessary.

The high-speed platform overlaps the medium-speed platform, which, in turn, overlaps the low-speed platform. This difference in elevation is secured by the use of 8-in., 7-in. and 6-in. wheels on the high, medium and low-speed platforms respectively. The overhanging edge of each platform is covered with a non-slip tread to prevent accidents to passengers while passing from one platform to another. Posts on the low-speed and intermediate platforms are provided as supports to assist the less alert passengers in progressing from one platform to another. The third platform has a passageway 21 in. wide besides the seats, which occupy 36 in. of the width.

The application of the electric carrier system to the Forty-second Street loop would require three platforms, each approximately 10,100 ft. long. The seating capacity of the 9-mile platform would be 31,680 passengers per hour in each direction. The weight per seat for all three elements would be roughly 375 lb., while that of a loaded subway train is approximately 1,800 lb. per passenger. About 350 kw. would be necessary for its operation and about 3,000,000 kw-hr. per year. Although, electrically, the air gap of 3/16 in. used is far from ideal, the increased losses due to a low power factor are inconsiderable compared with the small amount of power required for its operation. The estimated initial cost of this project for equipment and its installation, exclusive of excavation, is about $750,000.

An electric carrier system installed as a demonstration plant near Paterson was in successful operation for several years and its use is now being contemplated for postal service in several large cities.

Preserve the Pole Line

Analysis of Pole Preservative Methods in Indiana Shows Ample Justification for Their Use—Data Upon Which This Analysis Is Based Were Secured from 100 Utilities

PRESERVATIVES for wooden poles, preservative treatments and all that pertains thereto are subjects of prime importance to electric railway distribution engineers and administrative officials. While very few pole lines constructed of treated poles have reached the replacement stage, any information that sheds light upon the subject is worth investigating. In a recent publication of the Engineering Experiment Station of Purdue University Prof. R. V. Achatz has set forth the results of a study which he made with particular reference to the needs of executives responsible for the construction policies of public utilities. Data for this study were obtained from about 100 electric railway, steam railroad, telephone, telegraph and electric power companies operating in the State of Indiana. The estimated annual requirements of these companies are about 40,000 poles. From 60 to 70 per cent of those now being set are given some kind of preservative treatment. Practically all of the well-known forms of pole treatment are being used.

Some timbers decay rapidly when exposed to the weather, while others are affected to an almost negligible extent. Most pole decay occurs at the ground line and the rapidity with which decay progresses depends greatly on the character of the soil and the climate. It is obvious, therefore, that no one preservative or method of treatment is best for all purposes. The choice of preservative should depend upon the conditions of service, as well as upon the method of application and the price.

To provide effective protection from decay the wood preservative must have strong germicidal properties; it must have penetrative ability; it must not evaporate, and it must not be soluble in water. Preservatives obtained by the distillation of coal tar possess these qualities and have come into wide use. Dead oil of coal tar or creosote oil and the higher boiling oils, known as carbolineums, are the most satisfactory preservatives. Coal tar itself should not be used, as it has little value as a preservative, and "mixed creosote oils"—that is, those preservatives containing undistilled products—are not recommended.

In Indiana the commonly used treatments are the brush and the open-tank. Poles of less durable woods treated by the pressure tank process are as yet expensive for this reason and have not come up to the present time into general use.

An analysis of the economic side of pole preservation shows that under average conditions an increase of life of about two years will justify brush treatment, three and one-half years open-tank dipping treatment in hot creosote, and seven and one-half years hot and cold-bath open-tank treatment. The results of the inspections made in various parts of Indiana indicate that an increase in life greater than that necessary to justify treatment will be secured if the treatment be properly given. In most cases where treatment has failed to protect the poles from decay the failure can be traced to improper treatment or to causes which the treatment itself could not control.

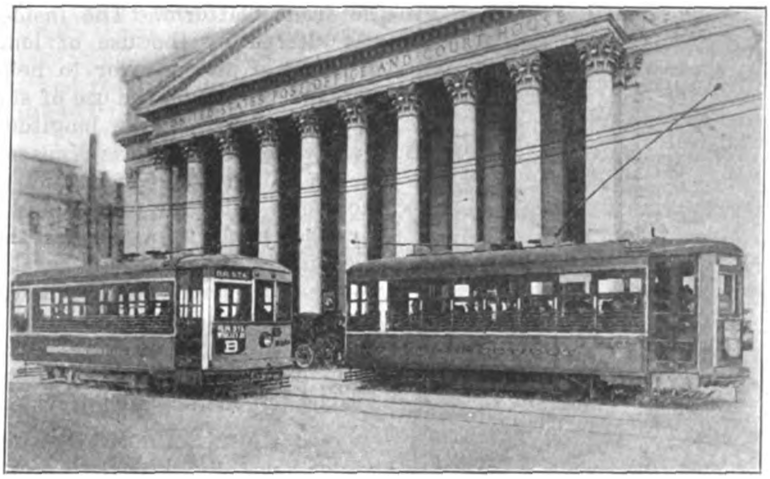
By far the greater number of poles in service at the present time have been set without preservative treatment. As the poles on the older lines are now nearing the end of their life much interest has arisen in the problem of deferring replacement. It is possible to do this to a certain extent by reinforcement and by treatment in place. The most common form of reinforcement is that of setting a creosoted stub alongside the weakened pole and binding the two together by wire. Another method used where decay has not progressed too far is to excavate the earth from around the pole, clear away the diseased wood and apply a brush treatment. Concrete reinforcement has been applied to some extent, but on account of cost can be recommended only where the cost of replacement is very large.

Report on Lubricants

A REPORT of the inquiry committee on lubricants and lubrication, made under the direction of the Department of Scientific and Industrial Reasearch in England, has just been published. This report contains the results of a research made to determine the relation between viscosity of lubricants and the load on a bearing and the action of lubricants at high temperatures as applied to commercial methods of oil testing. Copies of this report may be obtained directly by addressing H. M. Stationery Office at Imperial House, Kingsway, London.

Trend of Safety Car Construction

A Review of Some of the More Recent Changes in Safety Car Design Points Toward the Development of a Type with Increased Capacity, Greater Comfort and Convenience and Additional Safety —Changes During the Past Year Have Been Directed Principally Toward Increasing the Strength of Various Structural Parts



SAFETY CARS ARE A FAMILIAR SIGHT IN NEW HAVEN

ONE-MAN car operation has proved both satisfactory and economical for light and average service requirements. For lines where traffic is very dense a larger unit is needed. There is still a very commendable desire on the part of both operators and manufacturers to improve safety car construction and to enlarge the field of its usefulness. In the report of the committee on safety car operation, presented to the American Electric Railway Transportation & Traffic Association at its convention held in Atlantic City last October, conclusions were given as to the limitations of the safety car based on answers from member companies received to a questionnaire. This report states that half the companies that sent in information and are operating safety cars report changes and departures from specifications of the standard Birney safety car. The principal changes consist of:

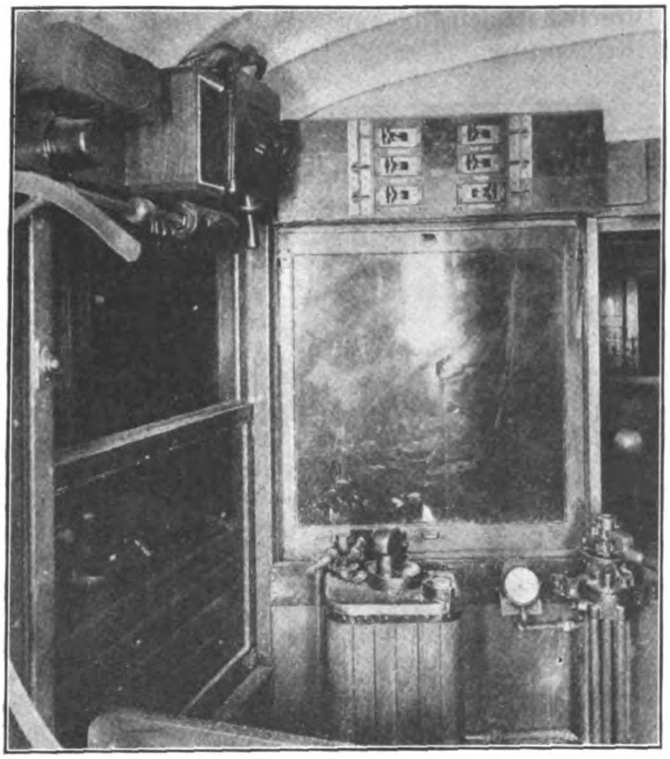
1. Use of heavier and better riding trucks.
2. 24-in. cast steel wheels replaced by 26-in. steel wheels.
3. Specially designed rubber cushions installed in the truck suspension bolts to reduce noise.
4. Larger motors used for propelling the car.
5. Larger compressors used.
6. Air piping located inside of car to prevent freezing.
7. Brake levers and chains provided with safety jaws.
8. Additional heaters installed in place of the eight used as standard, one of these being a cab heater.
9. Seating arrangement changed.
10. Wider seats and wider aisle used.
11. Wooden-slat seats replaced by full rattan covered or upholstered seats.
12. Fenders used in place of life guards.
13. Voltage push buttons without exposed metal parts used instead of buttons with exposed parts.
14. Platform arrangement revised to facilitate loading and passenger movement.
15. Maximum step height reduced by using ramp platform.
16. Double floor used.
17. Structural strength of underframe increased.
18. Platform strengthened.
19. Heavier bumpers and stronger dash used.
20. Heavier materials used for roof and sides.
21. Headlining added for interior ceiling to improve appearance and add warmth in winter.
22. Lining added between the floor and window sill along sides and dash.
23. Storm sashes added.

It will be noted from this list of changes that the more important ones have to do with increasing the strength of various structural parts, increasing the facility for boarding and alighting passengers, providing a seating arrangement to meet local conditions and providing more heating capacity and a more heat-resisting body construction in places where severe winter weather is encountered, the standard safety car having been developed for climatic conditions prevailing in the south. The changes have increased the weight of the car somewhat, but have undoubtedly resulted in a stronger construction and one which will withstand severe operating conditions more satisfactorily.

CHANGES IN CAR CONSTRUCTION

The present trend of safety car design can best be studied by considering some of the changes from the standard type of construction that have been made by various railways in an endeavor to meet operating conditions as they exist on their individual properties. In this analysis the changes which have been made and those which are being advocated by railway engineers as desirable can be grouped under five headings: (1) Changes necessary for strengthening construction; (2) changes for providing greater comfort and convenience to passengers as the use of wider and more comfortable seats, easier riding trucks and the reduction of step height; (3) changes found desirable for winter operation in cold climates, such as the use of lining, double floors, storm sash, an increased number of heaters and larger diameter steel wheels; (4) changes to provide greater safety to passengers, such as rearrangement of platform lights to illuminate steps, use of safety panels for switches and fuses, improvements in brake rigging, removal of circuit breakers from car vestibule, removal of foot valve from motorman's control; (5) changes which appear desirable in order to provide increased capacity and facilities for handling crowds on heavy traffic routes, such as the use of larger cars with longer platforms, double doors, platform railing, longitudinal seats at ends and a wider aisle.

From the standpoint of construction there appears to be rather a general feeling among the officials of railway operating companies that the first safety cars were built of too light construction, that to date the idea of maintaining the standard type of construction first advanced has received too great consideration by the builders and that there are essential a number of changes and refinements. The use of a stronger construction which seems advisable may necessitate the addition of slightly more weight, but perhaps the additional strength can be obtained through the use of better materials.



INCREASED SAFETY IS PROVIDED BY INSTALLING ALL SWITCHES AND FUSES IN A SAFETY PANEL

In this connection the remarks made by P. J. Kealy at the meeting of the Transportation & Traffic Association in Atlantic City Oct. 7, 1919, are of interest. In speaking of the changes made in the Kansas City safety cars, he said that he considered that the radical innovation with respect to the reduction of weight in safety car construction as carried out had produced a rather flimsy type of construction for severe operating conditions. As a result of this feeling many of the cars furnished during the past two years have had substantial changes made in the type of construction. This is probably best evidenced by the increase in weight of cars now being furnished, which is in the neighborhood of 16,000 lb., while the first safety cars weighed but 12,000 lb. In Kansas City the last order for safety cars required the strengthening of some of the structural members by the use of buffet plates and additional cross bracings. In the 200 cars furnished for the Brooklyn Rapid Transit Company a new type of truck of stronger construction with friction bearings was furnished. The vestibule construction was stiffened and a heavier bumper construction used. Other roads have required similar changes from the first type of standard construction.

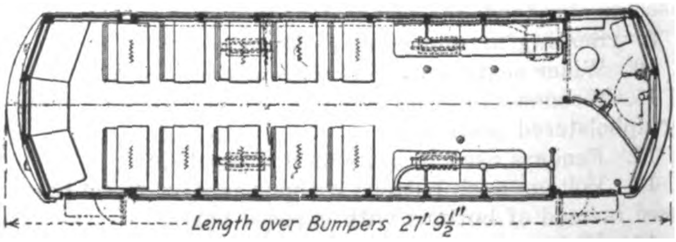
Providing Greater Comfort and Convenience for Passengers

The merchandising consideration of providing greater comfort and convenience for passengers is one which apparently warrants a deviation from standard construction. Changes which have been made and others which are advocated consist in the use of wider seats and a change from the standard wooden-slat-seat construction to a cushioned type; the use of easier riding trucks, and a reduction of step height to encourage more riding and to prove an added attraction apparently equal to that of frequent and fast service. In the Kansas City cars the distance of the first step above the rail is reduced from 16 in. to 14 in. by placing the wheel housings under the seats and by using a very slight ramp in the floor of the front platform. The inside seating arrangement was altered by the use of longitudinal seats at the entrance in an endeavor to help eliminate congestion, and stanchions for the use of standing passengers were placed in front of the longitudinal seats. Cushioned seats were also used, as Kansas City officials felt that the traveling public in that city had been educated to the use of this type of seat and it was easier to fit the car to the public than to expect the public to accommodate itself to certain changes in car design. Their experience was that the public would not walk back through a long narrow aisle and they considered the idea of the original seating arrangement of the safety car as directly counter to the latest development in seating design of the last ten years, which provided a loading well.

Changes Found Necessary to Meet Severe Winter Conditions

The standard safety car as originally designed was for service on the Stone & Webster lines in Texas and other Southern railway properties. For service in cold climates and locations subject to severe winter conditions experience has already demonstrated the necessity of equipping certain cars with both side and head lining. The use of storm sash and double floors also has appeared essential, as well as an increase in the number of heaters, and perhaps the employment of cross-seat heaters to give a better distribution of heat, as was first used in Brooklyn for these cars. On this latter road ten cross-seat heaters and two truss-plank heaters were used per car. The truss-plank heaters were installed under the motorman's seat to act as cab heaters for the operator. There is no doubt that the cross-seat type of heater is the most popular with the traveling public and Brooklyn officials felt that by specifying this type for their cars they would help to make safety cars more popular with passengers.

Some of the changes found necessary in the safety cars used at Levis, Que., in order to provide for severe winter conditions as they exist there, are of interest as indicating what may be necessary in cars operating in northern climates. The principal differences from the usual standard features of car construction are: (1) Double lining throughout; (2) double floor; (3) storm windows or sashes on all windows; (4) ventilators capable of being closed as required; (5) all vestibule windows permanently fixed except center



SEATING ARRANGEMENT FOR SINGLE-END SAFETY CAR AS USED IN KANSAS CITY window, being drop sash; (6) air equipment especially installed with proper amount of radiating pipe to prevent freezing of air and moisture accumulation from the cold; (7) operating motors with covers for closing up of the ventilating ducts in winter to prevent snow accumulation; (8) the use of 26-in. wheels to give a maximum clearance on account of high centers caused by snow and ice, and (9) the use of twelve heaters per car instead of the standard number. An article describing these cars published in the April 3, 1920, issue of the ELECTRIC RAILWAY JOURNAL, page 699, gives other interesting information regarding changes which were incorporated in these cars and results from their operation during the severe winter of 1919-20.

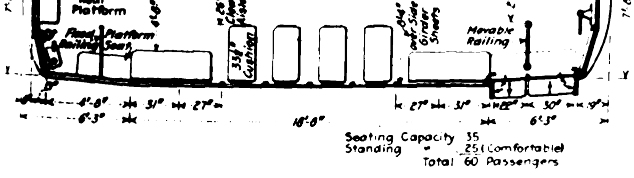
PROVIDING GREATER SAFETY FOR THE TRAVELING PUBLIC

The name "safety car" is now generally accepted as designating this type of one-man car and a determined effort should be made to increase its safety features wherever possible in order that the traveling public may be more thoroughly convinced that this type of car is in reality safer than the ordinary two-man car.

In reviewing the answers to the questionnaire sent out by the committee on safety car operation of the American Electric Railway Association it appears that the majority of accidents which have happened are due to the operator devoting his attention to passengers while making change or issuing transfers while the car is in motion. The use of the foot valve in connection with the car operating equipment, while a great convenience to the operator, is looked upon with suspicion by some managements as encouraging the operator toward other duties which detract from the proper operation of his equipment.

With the present standard location of equipment, the circuit breaker is located inside the front vestibule. Whenever overload conditions occur the blowing of this circuit breaker alarms the passengers, and in cases of crowded conditions injury is liable to result. On other types of equipment it has long been considered essential to place all circuit breaking mechanism underneath the car and remove all danger from serious results of this character to a location remote from passengers. The changing of the present location of the circuit breaker has been considered in several instances as offering a field for improvement.

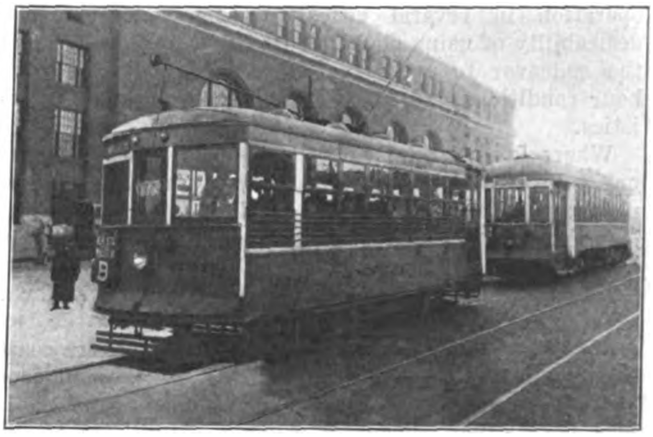
To prevent the lights in the body of the car from interfering with the view of the motorman during hours of darkness a curtain is provided which is drawn around the back and right side of him. The lights to the right of the operator are also equipped with shades for this purpose. It has been suggested that a better arrangement of lights could be provided, so as to provide not only for less interference with the view of the motorman but also to provide illumination of the step when the door is opened.



A PROPOSED SEATING ARRANGEMENT FOR DOUBLE-END SAFETY CAR WITH DOUBLE DOORS

The use of a safety panel for all switches and fuses in the light, buzzer, compressor, register and heater circuits as first used on the cars of the Brooklyn Rapid Transit Company is also an additional feature of safety worthy of consideration, as is also the use of push buttons without exposed metal parts, as was suggested in the first part of this article.

Improvements in brake rigging connections by the use of box-type jaws have been furnished for cars of operating companies controlled by the Second District Public Service Commission of the State of New York. In his report to the commission regarding this feature, Charles R. Barnes, then chief of the division of electric railways for the commission, reported that there were at least thirteen points in the braking system where if a bolt broke or became loose and dropped out it would disable the entire braking system for both air and hand operation. His recommendation was that the braking system should be improved by the use of box-type jaws at all points where members were connected with clevis and bolts, and this, it is understood, is being required by all cars controlled by the Second District Public Service Commission.



FREQUENT SERVICE WITH SAFETY CARS HAS INCREASED TRAVEL AND MADE THEM A SUCCESS

A LARGER CAR IS BEING ADVOCATED FOR SOME LOCALITIES

Where safety cars have been used in large cities, such as Brooklyn, Philadelphia, Baltimore, Boston, etc., their use has been confined in most instances to routes having light traffic characteristics. Where existing headways are three minutes or less and where traffic is so heavy at times even during off-peak periods that car-carrying capacity is a controlling factor, the usefulness of the standard safety car is restricted, because of its smaller carrying capacity and the fact that no improvement in earnings may be expected from improved headway. The use of the safety car has produced such marked economies in communities with less severe service characteristics that these economies have led to a desire to try to adapt the safety car if possible to crowded conditions. This has already led in a small way to the tentative use of larger double-track cars with one-man safety features.

There is without doubt a growing tendency toward increasing the capacity and facilities for handling crowds and heavier traffic with one-man operated cars. The question as to whether one man can satisfactorily handle this increased traffic is still debatable and there is strong opposition from certain quarters regarding its feasibility. This problem of whether such a car can be handled satisfactorily by one man will have to be worked out by actual trials in service. In addition to providing a car with increased seating capacity, designs for such a car will include longer platforms, the use of double doors for entrance and exit of passengers, the employment of platform railings to separate incoming from outgoing passengers, the use of longitudinal seats at the ends of the car body to provide ample space for passenger movement and for standing passengers and the use of a wider aisle so that passengers can move in and out of their seats with greater freedom. Double doors for cars with provisions for separating incoming and outgoing passengers have been built and are in operation in several cities in this country. The desirability of using double doors has come largely from the endeavor to make the safety car serve for rush hour conditions and lines with heavy traffic characteristics.

Where large groups of people board and alight at one point there is undoubtedly an annoyance to the passengers boarding in their having to wait until the leaving passengers are all discharged before they can get on. Some of the principal arguments used against the adoption of double doors for a one-man operated car are that one man cannot satisfactorily handle the two streams of traffic and that as soon as passengers cease getting off those waiting to board will use the exit door in order to gain access. With the two openings, there is also danger that passengers may slip in without paying their fare. Such radical changes in design as this are also considered as a setback to the standardization. The cost of such a car would be increased and its weight per passenger seated would unquestionably be more.

As an example of a one-man car of somewhat greater proportions and seating capacity than that of the standard Birney car, the Three Rivers Traction Company of Three Rivers, Que., has recently added four cars to its equipment with general dimensions as follows:

Length of body	21 ft.
Length of front vestibule	6 ft. 2 in.
Length of rear vestibule	4 ft.
Length over bumpers	32 ft. 2 in.
Width of car bumper	8 ft. 6 in.
Seating capacity	36 persons

The front vestibule of this car is made extra long and the step opening is extra wide to facilitate entrance and exit. Separate openings are also provided for entrance and exit and each opening has an individual folding door and step operated by a National Pneumatic Company door-engine. These are so arranged that the motorman can operate them singly if desired.

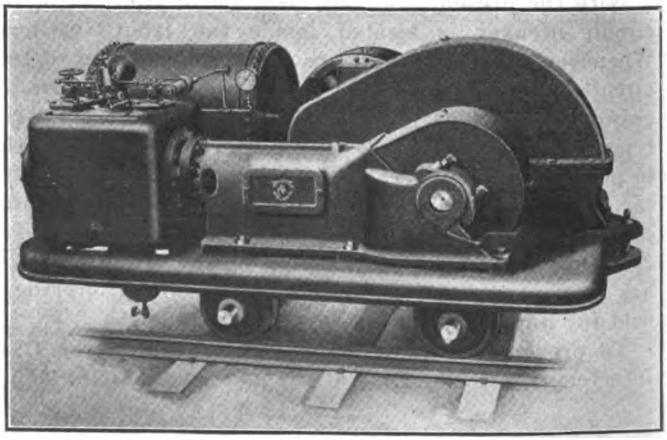
A proposed type of car having these characteristics was described in the ELECTRIC RAILWAY JOURNAL for Sept. 18, 1920, page 549. The principal idea of this design was to make available the great economic advantages of the safety car to properties operating in large cities and having extremely heavy traffic conditions. Other operating engineers are also making studies for a type of car built along these general lines.

The desirability of a separate entrance and exit is not confined to the idea of developing a larger car for congested traffic conditions as is evidenced by their use at the present time in small-sized cities. In Mason City, Iowa, and Madison, Wis., the introduction of the double door came about through a desire to reduce length of stops and to avoid annoyance to boarding passengers by compelling them to wait until all have alighted. Nevertheless, it is noteworthy that safety car operators in much larger cities have expressed themselves as content with the standard platform and doorway arrangements.

The safety car, embodying as it does the most decided step ever taken toward standardization, has caused some rather sharp conflicts between the users and manufacturers. The advantages of standardization cannot be doubted. However, in insisting on rigid adherence to standards, there should be no stifling of sound development in the improvement of the safety car or any of its equipment. Many worthy changes have already been introduced since this type of car was brought out, and it would be unreasonable to expect that other still important changes should not be incorporated. The most general feeling in regard to standardization on this particular car seems to be that the present general dimensions of length, width, height and general capacity are satisfactory. With the improvement in strengthening construction that is advocated the standardization of the body construction would be pretty generally adopted for local service. The finishings and the car-seating arrangement, etc., should be left to individual operating companies.

Portable Air Compressor

A FLEXIBLE and economical compressor outfit which can be moved to the point of distribution has recently been placed on the market by the Chicago Pneumatic Tool Company. The feature of portability results in the elimination of line losses and expensive piping systems. Where air is used at a great distance from the compressor and where temporary piping is laid which is subject to much abuse, the line losses are very high. The economy effected by the elimination of these losses far more than offsets the difference in efficiency between one large unit and several smaller ones, not to mention the saving in time, trouble and expense of laying pipe lines.



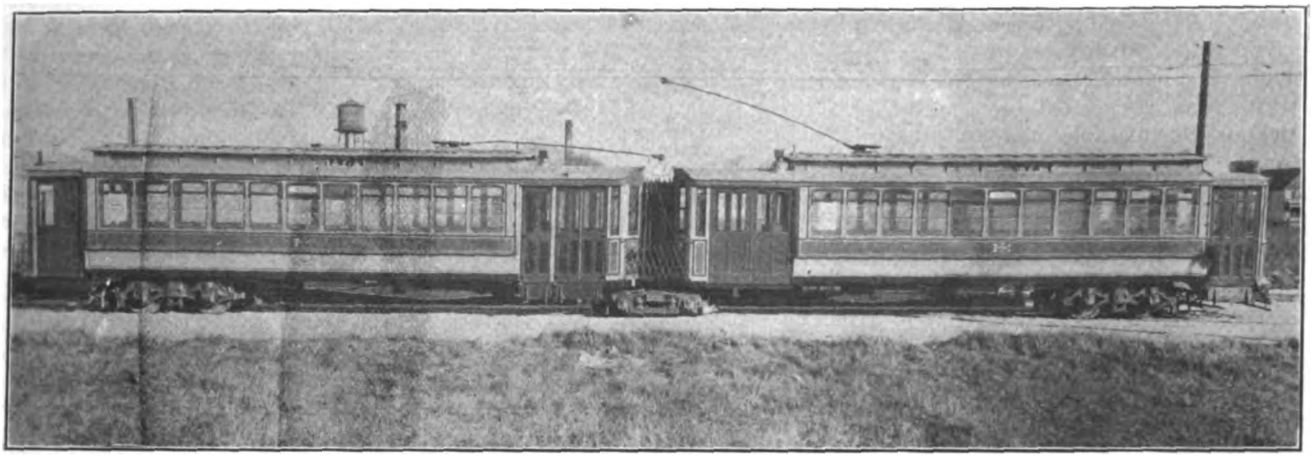
PORTABLE ELECTRIC-DRIVEN AIR-COMPRESSOR UNIT

This rugged and simple compressor of the horizontal single-stage type is totally inclosed. It is hopper water-cooled and driven by an electric motor through herring-bone gears. The complete outfit, consisting of compressor, air reservoir, motor and starter, is mounted on a substantial car readily adjustable to suit any track gage commonly found. Although this outfit is primarily designed for the mining industry, its usefulness is not confined to that field. It is possible to make it portable on almost any system so that a supply of air would be available for pneumatic tools. It is made in capacities of 147, 218 and 314 cu.ft. of free air per minute.

Milwaukee's Three-Truck, Two-Man Train Declared Successful*

General Plan of Construction of This Unique Equipment, Operated on Combined Urban and Interurban Property, Is Described and Other Experiences in Various Train Operation Related—Some of the Advantages Are Economy in Platform Labor and Increased Flexibility Over Single-End Trains Both in Service and at Carhouses

By S. B. WAY
Vice-President and General Manager Milwaukee (Wis.) Electric Railway & Light Company



MILWAUKEE'S THREE-TRUCK, TWO-MAN TRAIN BUILT FROM TWO OLD DOUBLE-TRUCK CARS

FOR a number of years electric railways have found it very difficult to obtain capital for new construction. Managements faced with the necessity of effecting every operating economy possible without a reduction in the quantity of service, and unable to spend money for new equipment, even though operating economies would certainly result, have found this necessity truly the mother of invention. The problems to be solved were: (1) To run more service through sections already congested to apparent capacity; (2) to do this with fewer trainmen; (3) to do this with smaller expenditures for power and for maintenance of tracks and cars; that is, to reduce the car weight per unit of capacity; (4) and finally, and this is controlling, to do the job without spending any money.

This problem had to be faced in 1917 to 1920, when equipment prices were advancing from twice to three times the values obtaining at any time in forty years. The problem, of course, has not been completely solved. Various attempts have been made with varying results. Perhaps a brief review of the experiments made over the course of several years in Milwaukee will be of interest.

The Milwaukee system is a combined urban and interurban property. In the operation of its interurban system the company has for many years operated interurban cars in trains, always, however, concentrating the power in one unit and employing two, three and even four plain trailers for the remaining units in each train.

In 1912, incident to a general plan of revamping and modernizing its old urban equipment, advantage was taken of the opportunity to regroup the motors on certain cars, making such cars capable of pulling trailers and at the same time avoiding the necessity for purchasing as much motor equipment as would have been necessary had all cars been re-equipped with motors. The experience on the interurban system naturally suggested that, in constructing trains, the second car should be a plain trailer and be pulled behind a suitable motor. During the years 1912 and 1913 all but seventy-two of the company's older types of cars were thoroughly overhauled and re-equipped, and fifty-four of these cars were stripped of motors, controllers, trolleys, etc., and arranged with detachable couplers and suitable light wiring and air connection, to permit them to be operated as trailers. As the system and all of the single-car units were arranged for double-end operation, it was necessary to make certain special track arrangements for the operation of these single-end trains around loops. These loops were generally placed some distance short of the ends of the lines upon which the trains were scheduled, resulting in short-route operation of the two-car trains.

Experience with these fifty-four trains developed, of course, some economy in platform labor, but cost of loops and the lack of flexibility of the single-end trains, both on the system and in the car stations, deterred the management from extending train operation for some time thereafter. In the light of more recent experience it is difficult to understand why the cars were entirely stripped of motors and power wiring, controllers and trolleys and a less convenient and more expensive method of operation chosen. It would have been somewhat cheaper to arrange these same cars for double-end operation in two-car trains, thus making them available for use anywhere on the system with equal flexibility with the single-car units.

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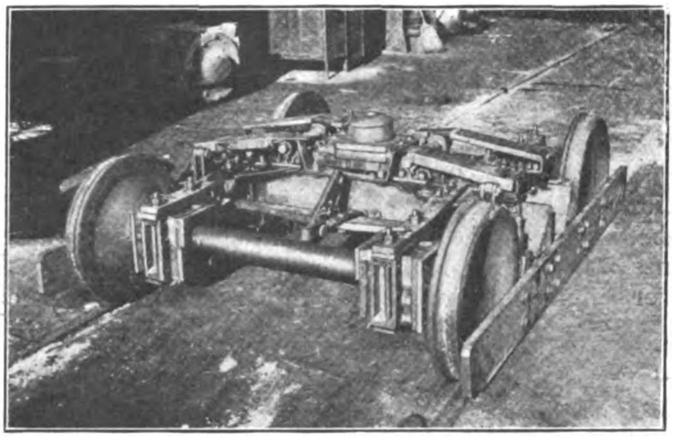
*Abstract of paper read before joint meeting of A. I. E. E. and W. S. E., Chicago, Dec. 17, 1920.



SPECIALLY CONSTRUCTED CENTER TRUCK HAVING INSIDE JOURNALS FOR USE ON THREE-TRUCK TRAIN

No further progress was made in the development of train operation in Milwaukee until about 1916, when the company undertook to build in its own shops fifty new cars of the center-entrance and exit and front-end exit type. These cars were equipped with two motors, maximum-traction trucks and multiple-unit control, with a view of operating in two- or three-car trains. In choosing these cars the advantage of double-end operation of the trains was recognized, although considerable additional expense was incurred in arranging the cars for both single-unit operation and train operation, which might have been saved by arranging them for train operation only. These cars operated in trains afforded further economy in the use of labor. The last of these cars were placed in service at the beginning of the year 1918.

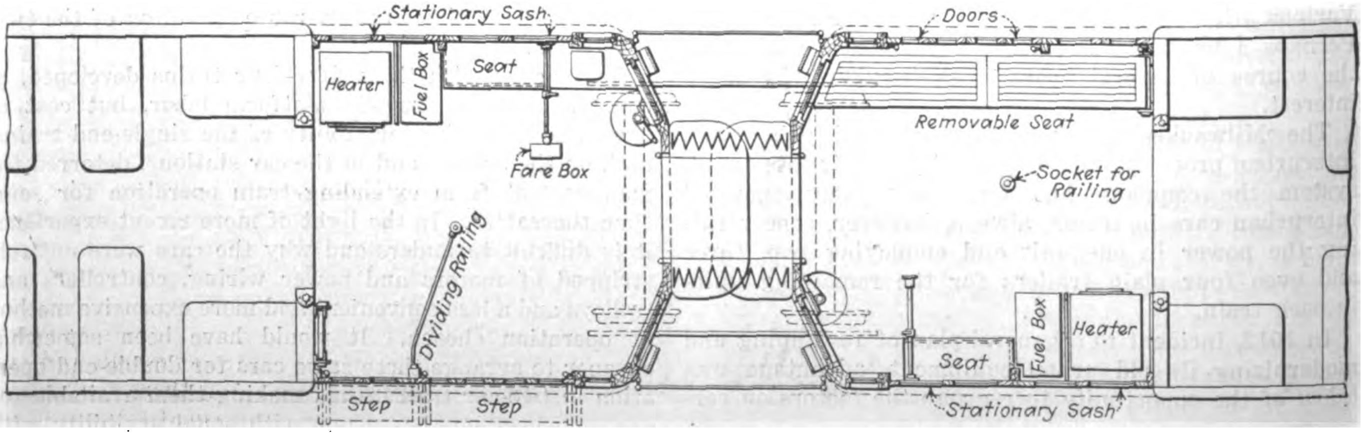
The demonstrated advantages of double-end train operation, of course, suggested the idea of coupling up existing equipment where possible to achieve further economy in the use of platform labor. The company had a certain number of old cars more or less modernized which were equipped with two motors each. The controllers, standard on the property, are readily capable of handling four motors. The next development involved merely putting pairs of these cars together with permanent coupling, rearranging the wiring and carrying it through on the permanent coupling bar, stripping each car of one trolley and one set of air and electric controls and removing one air compressor. Cars so put together operated perfectly as double-end two-car trains.

While this development was going on, war conditions were rapidly advancing the cost of labor and material and platform labor was becoming extremely scarce, even though wages were rapidly advanced. Seventy-two of the oldest cars owned by the company and which had been excluded from the original program of reconstruction and modernizing had by this time become sorely in need of general overhauling if they were to be kept longer in service. Under ordinary circumstances it is probable that these cars, on account of their extreme age, would have been scheduled for retirement from service. Under war conditions this treatment was of course out of the question. The problem presented was how to treat these cars, incident to the necessary repair and reconstruction, so as to derive the maximum benefit from the expenditure. It was reasoned that if double-end, two-car trains operated by three men were advantageous, as compared with single-unit operation with two men per car, a two-car train arranged to be handled by one conductor would be even more advantageous. This point was emphasized by two considerations, namely: (1) Scarcity and high cost of platform labor; (2) difficulty of making tripper runs attractive to men without payment of excessive bonus time.

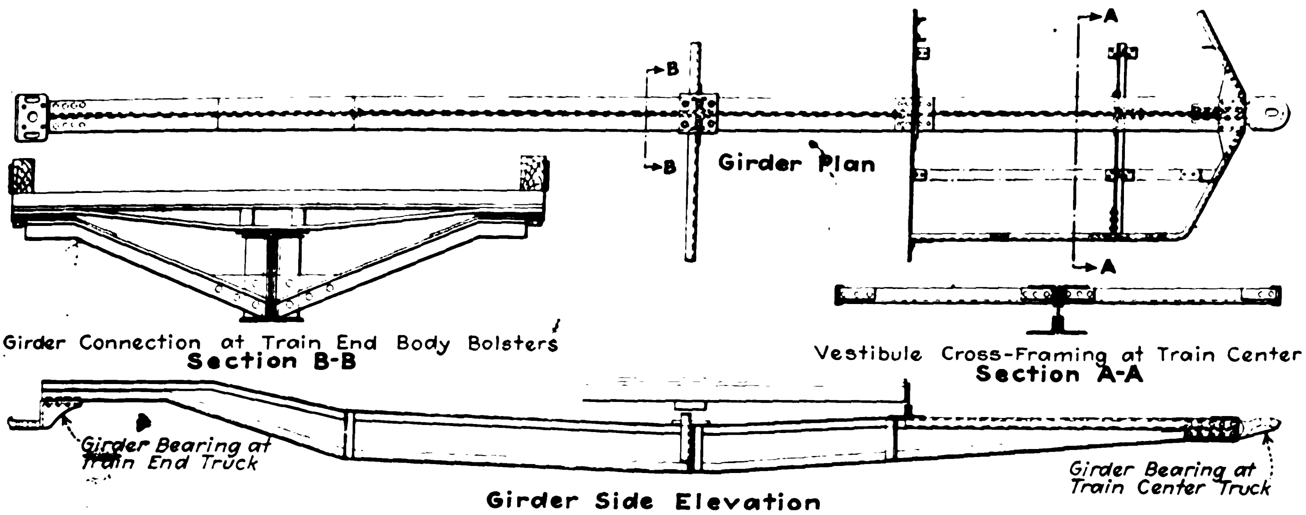
CONSTRUCTION OF THE THREE-TRUCK TRAIN

To handle a two-car train with one conductor in city service requires, of course, that the passengers be allowed to pass freely from one car to the other while the cars are in motion and rounding curves, etc. This requires the careful articulation of the cars and the elimination of all possible motion and displacement of the two car bodies at the point of connection. It also requires the location of the conductor at a point to control the admission of all passengers and the exit of all passengers from the rear car. This became virtually the same problem as that of the location of the conductor in a large center-entrance car. All of these requirements pointed to the connection of the two cars with minimum amount of space at the adjacent platforms and the support at that point of a single truck.

In adapting these old cars to these conditions it was necessary to support the old car bodies in substantially the same manner as they had been previously carried upon individual trucks, namely, at the car body bolsters. This was accomplished by placing under each car an auxiliary steel underframe beginning at the outer truck bolster and continuing through to the point of joining the two car bodies together. By suitable design, this steel underframe carries the weight of the car at the



FLOOR PLAN OF CENTER PLATFORMS


A
B
B
Girder Plan
A
Girder Connection at Train End Body Bolsters
Section B-B
Vestibule Cross-Framing at Train Center
Section A-A
Girder Bearing at Train End Truck
Girder Bearing at Train Center Truck
Girder Side Elevation

DRAWING OF SPECIAL GIRDER USED UNDER EACH CAR IN THREE-TRUCK TRAIN

old car body bolster, provides adequate support for a greatly enlarged platform and transmits the load to the center truck, where a kind of ball and socket joint arrangement on the ends of the two main auxiliary girders permits both to rest and pivot on the center-truck kingpin and bolster.

The enlarged platforms were desired in order to provide space for the larger number of passengers to be handled and to accommodate the heating equipment. The platforms were connected by overlapping steel plates attached to the platforms, and arranged to permit the necessary joint movement on curves. The vestibules were connected by diaphragm. The motors of the cars were regrouped on the outer trucks, giving the train the same motor power as cars possessed when individually operated, and, accordingly, the same speed and power when arranged as a train.

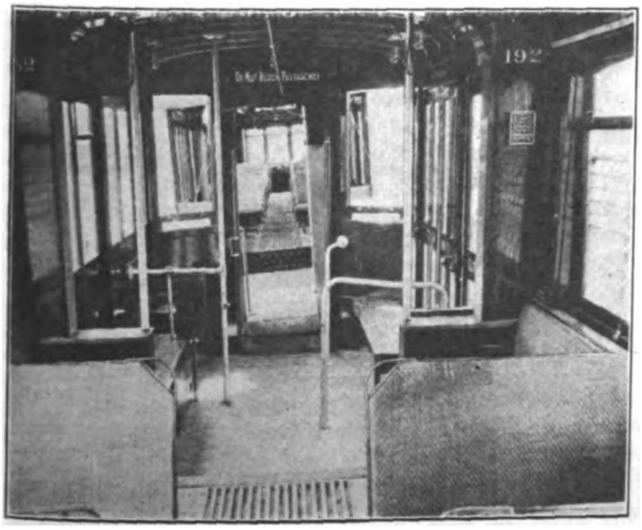
In the actual reconstruction of these old cars into three-truck trains it was found possible to increase the combined seating capacity from 84 to 106 in summer and from 80 to 102 in winter, and the standing capacity an even greater percentage. The old car bodies were greatly strengthened by the use of the steel underframes. There were recovered from each pair of cars two trolleys, two sets of air and electric control, one air compressor, two standard trucks, besides various minor equipment, such as destination signs and headlights. And notwithstanding the addition of the third truck, new steel underframes and enlarged platforms, the total weight of the finished train is only slightly more than the combined weight of the individual cars.

On account of the exposure of the center truck, particularly on curves, it was found desirable to reduce the lateral dimensions of the truck and necessary clearance to a minimum. This was accomplished by building a special truck having inside journal boxes. A picture of this truck is reproduced herewith.

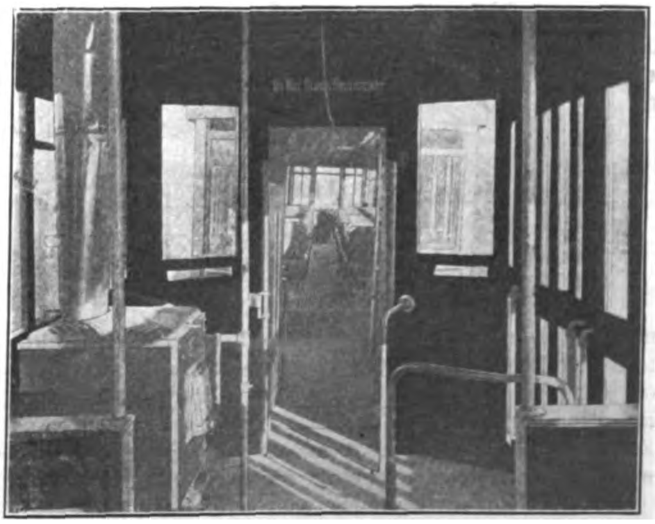
ADVANTAGES AND DISADVANTAGES OF THE THREE-TRUCK TRAIN

Experience has shown that these three-truck units have the following advantages:

1. Utilization of old obsolete equipment in a manner making it entirely acceptable for rush-hour service and for other special service, as well as for regular service on very heavy lines where the traffic justifies the operation of units of this size.
2. Economy in platform labor.
3. Adaptability for operation as either straight pay-as-you-enter or as a combination pay-enter and pay-leave system.
4. Better control of distribution of passenger load.



CENTER PLATFORMS, LOOKING FORWARD, SHOWING PLATFORM SEATS AND PASSAGEWAY BETWEEN CARS



CENTER PLATFORMS, LOOKING BACKWARD, SHOWING ARRANGEMENT OF STANCHIONS AND LOCATION OF HEATER

The disadvantages of the these units are:

1. Difficulty of locating the trolley stand so as to be accessible to the conductor and yet avoid frequent leaving the wire on curves. Where electric switches are not operated, the preferable location of the trolley is over the rear truck. On a system operating single-car units and electric switches it is necessary to employ a special swiveling trolley which in practice follows the wire substantially as well as the standard trolley mounted over the car truck. It requires, however, to be equipped with two ropes in order to handle it around the diaphragm connection between the cars.

2. Slowness in loading, as compared with single-car units. The same objection, however, would apply to increasing the size of single cars. In Milwaukee operation this disadvantage is of no moment, as street fare collectors are employed at all congested corners to facilitate operation of all types of trains and single-car units during the rush hour.

In the particular case of reconstructed old cars into three-car trains these general results were achieved:

1. The winter seating capacity was increased from 40 per car to 102 per train, or 27.5 per cent.

2. The weight per seated passenger was reduced from 913 lb. to 735 lb., or 19.4 per cent.

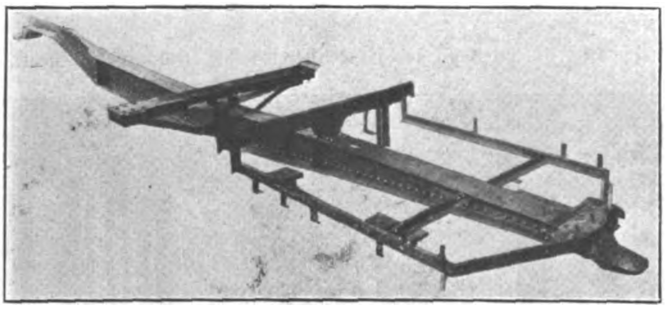
3. Rush-hour capacity (as determined by standards of the Wisconsin Railroad Commission) per trainman increased from 30 passengers before reconstruction to 76 passengers, or 153 per cent.

4. Rush-hour capacity per trainman increased 31 per cent, as compared with largest two-car, three-man trains operating at same service standard with fifty-eight passengers per man.

5. Power consumption per passenger under rush-hour capacity reduced 26.6 per cent as compared with the same cars operated singly before reconstruction.

6. The net cost of providing the increased rush-hour capacity did not exceed $72 per passenger, or less than one-half the cost per passenger of purchasing the cheapest character of new equipment.

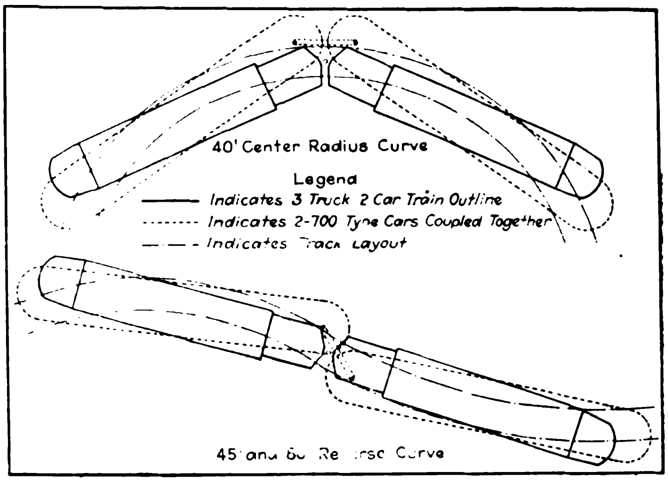
In general the train has proved satisfactory in operating characteristics. Thirty-three of these trains are now in service, the first one having been operated fourteen months. The passengers accepted the trains without comment or notice. They have attracted no special attention from the local public or the press. The trains keep their place on the road and do not get behind schedule to as great an extent as three-man trains.



SPECIAL STEEL GIRDER UNDERFRAME CONSTRUCTED UNDER EACH CAR TO PROVIDE MAIN SUPPORT FROM CENTER TRUCK TO EITHER END TRUCK

With three-man trains the passengers show a preference for the first car in the ratio of about eight to five. With the three-truck train there appears to be no preference shown, but this may in part be accounted for by the fact that the conductor has an opportunity to control the distribution of the load.

The gross cost of converting the old cars into three-truck trains, including thorough overhauling and repair of old bodies and trucks and enclosing the old semi-open platforms, averaged about $3,000 per pair. The conservative value of the equipment recovered is more than $900. The net cost of converting these very old and obsolete and rather small cars into attractive trains which are economical and satisfactory for operation for many years to come is returned through direct saving in platform labor alone in less than one year.


40' Center Radius Curve
Legend
Indicates 3 Truck 2 Car Train Outline
Indicates 2-700 Type Cars Coupled Together
Indicates Track Layout
45' and 60' Reverse Curve

COMPARATIVE CLEARANCE DIAGRAMS OF THREE-TRUCK TRAIN AND ORDINARY TWO-CAR TRAIN ON CURVES

No careful study has been made to disclose the further economies which might be achieved in constructing three-truck trains entirely from new materials. It is certain, however, that substantial gains would be possible in respect to weight, power consumption and first cost as compared with providing the same capacity in single cars or in two-car trains of the multiple-unit type. The cost of a three-truck train should not exceed the cost of a motor car and trailer of equivalent carrying capacity but requiring three men to operate.

GENERAL CONCLUSIONS

Experience in train operation on surface lines leads to the following general conclusions:

1. A comparatively large number of trains may be operated advantageously on any fairly large urban system. The maximum number that may be so operated depends on local conditions, but in general may be taken as being equal to at least 80 per cent of the rush-hour trippers. From a traffic standpoint it would be possible to operate 100 per cent of the trippers in trains. Extra single cars for scheduled inspections and washing, but available for rush-hour service, accounts for the lower percentage of trippers in trains which can be operated in practice. Figures from the Milwaukee system, given above, will illustrate the point.

Total cars owned	600
Total cars scheduled maximum rush hour	566
Total cars scheduled maximum non-rush hour	254
Total single cars	336
Total cars in trains	264
Single cars for shop	24
Single cars for regular inspection and washing	58
Single cars available for rush hour	312
Cars in trains for shop	10
Cars in trains available for rush hour	254
Ratio cars in trains to total cars	44 per cent
Ratio cars in trains to single cars	78.6 per cent
Ratio cars in trains to rush-hour trippers	81.4 per cent

2. Trains load somewhat slower than single cars, but this disadvantage is largely overcome by using street fare collectors. Whatever disadvantages exist are small in comparison with the advantages derived from economy in platform labor and track space.

3. Cars in trains are economical and satisfactory for many classes of special service such as baseball, theater crowds, picnics and the like. In such cases loading and unloading time is relatively unimportant, particularly where cars are standing between going and returning loads.

4. In rush-hour and special service the distortion in headway is not important as cars run close together in any event.

5. The use of a substantial percentage of the total equipment in trains assists greatly in working out good runs for the men, also in reducing the number of extra men and payroll time not worked. The more rigid the agreement or rules under which the men work respecting percentage of straight runs, limits on spread of duty and extra time for overtime the more advantageous train operation becomes from the labor standpoint.

6. It is practicable to operate an unmotored unit of a train either ahead or behind the motor car. The control is easily carried through and the train operates as well in one direction as the other. This is of importance mainly on systems which operate double-end. Double-end trains are, of course, easier to handle in car stations and admit of short routing without loops.

7. It is not desirable or necessary to couple and uncouple trains daily or even frequently. Automatic air and electric couplers are expensive and any other kind involve serious hazards in operation. Couplers must swing through a long arc and even if automatic, as far as making connections is concerned, they must be handled with extreme care if frequent injuries to hostlers and other employees are to be avoided. About the only excuse for the use of readily detachable couplers is to enable one car of a train to continue in service if the other is disabled. A non-detachable coupling greatly simplifies and cheapens the making of trains from single units.

8. It is important to use folding steps and platform-inclosing doors in train operation in the interest of avoiding accidents to passengers who attempt to board or leave the leading car while in motion.

Duties of Bridge and Building Inspectors

A Standard Form for Instructions Is Given for the Guidance and Information of Inspectors, with the Salient Features of Their Duties—Importance of Properly Trained Men Recognized

BY HOWARD H. GEORGE
Engineer Maintenance of Way Public Service Railway of New Jersey

THE Public Service Railway of New Jersey long ago recognized the importance of properly trained men for performing inspection work and standard instructions were compiled which were the result of very careful study of the requirements for the particular class of work under consideration. Sometimes new men are employed whose experience has been rather limited in the particular field in which they are placed and such men must be trained for the requirements of their new positions. Some men are more apt than others and absorb and retain information more readily. Individual instruction is desirable in many cases where special considerations are involved, but this frequently results in a duplication of work on the part of whomever may be in charge, and verbal instructions are frequently forgotten by the inspector. More often, the engineer in charge will unintentionally neglect to give the proper instructions on points to which it is essential that special attention be given, and there is very frequently a decided lack of uniformity in the instructions issued to different men on the same class of work. This practice, in many cases, leaves entirely too many questions to the individual judgment of the inspector, and where the experience of the latter has not been very broad this is liable to lead to difficulties.

In this article is reproduced a standard set of instructions which have been in use a number of years for the guidance and information of inspectors on building and bridge construction. The advantage of having such standard instructions to turn over to such men is that during the few spare minutes that may present themselves the inspector has an opportunity to refresh his memory as to what is required and expected of him. The salient features of his duties are more apt to be impressed on his mind, and it relieves him of uncertainty and avoids many delays to the work which would otherwise occur while he is awaiting definite instructions. When arranged in convenient pamphlet form they can be readily carried and referred to from time to time. In addition, the engineer or architect in charge of the work is relieved of some of his worries because he is assured that his inspectors have at least been properly instructed. The following instructions will be of service in such cases.

Information for Building and Bridge Inspectors

Carefully study all plans, elevations or other drawings, and also all specifications, and see that the drawings are in conformity with each other and with the specifications.

Check all figures and dimensions on plans and details; check shop details as they are received to see that they do not conflict with scale drawings; also check all erection drawings in order to recommend some other procedure in an emergency should the necessity occur; also see that the specifications or special intentions agree.

Keep on the work in an accessible location special copies of all drawings, details and specifications, and carefully note on same any changes from the original plans, so as to keep a complete record of the work constructed.

Familiarize yourself with all local conditions or ordinances affecting the work and see that the same are rigidly adhered to.

Make the acquaintance of and keep in touch with the general contractor and all sub-contractors or other principals engaged on the work.

Establish diplomatic relations with adjoining property owners or residents, and see that all their rights are respected by the contractors.

Acquaint yourself with all traffic arrangements, whether regular or special, that may interfere in any way with the progress of the work.

Secure full information concerning the conditions of steel work being fabricated in the mills or shops; also of any other materials that may be under the course of construction, and ascertain the names of all contractors for same, date of orders and the probable date of shipment, and if necessary closely follow up same in order to secure proper delivery.

Should any incomplete work be fabricated that will need attention and correction at the site carefully look out for and see that all corrections are made before same is incorporated in the structure.

MATERIAL SHORTAGE CAN BE PREVENTED BY CAREFUL CHECKING

Keep a record of the arrival of all materials. The contractor's record should be sufficient, if suitable, but should be carefully checked. Strive to anticipate any shortage of material and use all available facilities to hasten delivery; also arrange for the proper storage of same on the site.

Try to anticipate the need of detail drawings and notify the engineer or architect regarding same.

Study the progress of the work and try to determine whether it will be completed in the specified time, and, if in your opinion it will not be finished as specified, endeavor to secure such additions to the force and equipment as will secure completion within the allotted time.

See that the company's photographer is kept informed as to the progress of the work and that "progress photographs" are taken at least every ten days.

Keep a daily record of the force employed and the distribution of labor in such a manner as will clearly show the progress of the work, and also of all equipment in use at all times.

When "unit prices" are called for make a careful report of the cost of all material and labor which are included in same, separating the two items.

NEVER INTERRUPT SERVICE WITHOUT NOTIFYING TRANSPORTATION DEPARTMENT

Where necessary to interrupt regular car service see that sufficient notice is given the transportation department. Have full preparations made beforehand, so that such interruption shall be as short as possible and will occur at such a time as will least interfere with normal operation. Make a record of all delays to operation caused by such work; also see that proper signals are displayed for the protection of cars.

Keep in close touch with the office and designing engineer or architect and consult with them frequently as to the interpretation of all drawings or specifications.

Exercise a constant supervision of any sheath piling, underpinning, forms for concrete, or any other false work or temporary structure, and see that same are properly maintained and not removed until all masonry is set.

Keep careful account of any extra work in order to be able satisfactorily to explain and check all extras. Keep a daily record of the progress of the work in a separate field book for each job. Note the same, and, if any disputes arise, their settlement; also note variations, if any, from the plans or specifications. At the completion of the work see that all plans and specifications are corrected to agree with the work as constructed and make a final report showing costs where required.

Make careful preparations so that erection may proceed rapidly and that the period of any disturbance or delay may be reduced to a minimum.

See that all piping or sleeves for same are built through walls and that all other piping, conduits, drains or ducts called for in the plans are placed in the proper position and before any floors are laid or masonry constructed; also see that all chases or recesses are left in walls to receive piping, etc.

See that the substructures are placed and constructed in a manner that will conform to the steel plans.

Where piles are used in the foundation, the inspector shall see that they are properly driven and that they are cut off at the correct elevation.

PROPER SHORING WILL PREVENT TROUBLE FROM SHIFTING EARTH

Carefully observe all surface and subsurface conditions and see that all excavations are shored or sheet-piled where necessary. If surface drains are necessary see that same are installed in advance of masonry. Be sure that all waterproofing is thoroughly jointed and lapped. Do not allow back filling against green walls unless same are braced; also see that all back-fill is well puddled.

See that the grades of pipes are uniform and properly supported, and that all plumbing work conforms with the requirements of the local authorities. See that all joints are carefully made and watertight.

Where concrete is required, see that the proper proportions are used and that the materials are up to the specifications. See that all reinforcement is placed in its proper location and held in such a manner that the placing of the concrete will not disturb it.

Where blasting is necessary see that the proper protection and warning is given to the public and to the cars operating in the danger zone, and that it is done at such a time as to cause the least interference with operation. The charges are to be so regulated and covered that no damage will result.

See that all machinery and boiler foundations are built true to detail. See that all stone or terra-cotta work is perfect before same is placed in the work, and also see that all brick or other mason work is laid and anchored as specified. Be careful to see that all concrete work, whether reinforced or otherwise, is constructed as specified in all particulars.

See that all furring is in place and firmly secured before plaster work is started, and that sufficient time is given between coats, and that a proper backing is prepared for all tile and marble work.

See that all work is carefully aligned and accurately fitted. Closely watch the painting of all work.

Carefully examine all work before same is installed. See that all framing is accurately made and anchored and that all roughing and furring is built in. All finished work should be carefully inspected as to design, finish, etc. If necessary have a "mill inspection" made. Trim must not be applied until plastering is dry. See that all hardware is properly attached, including that to metal-covered work.

See that all flashings are carefully built in.

Be constantly on hand when work is in progress and note any damage to the metal, failure to conform to the specifications, or any special difficulty in assembling.

Make sure that each member of the structure is placed in its proper position. If match marks are used examine them with care. Endeavor to have the several members assembled in such order that no unsatisfactory makeshifts need be resorted to in getting some minor member in place.

Watch carefully the use of fillers, washers and threaded members to see that they are neither omitted nor misused.

Make certain that all parts of the structure are properly aligned and that the required camber exists before riveting. It is possible for a structure to be badly distorted although the rivet holes are well filled with bolts.

Watch the heating of rivets to insure against overheating and to make sure that scale is removed.

Examine and test carefully all field-driven rivets and have any that are loose or imperfect replaced.

Have cut out and replaced all rivets whether shop-driven or field-driven that may be loosened during erection and riveting.

Prevent injury to metal while removing rivets.

A careful and complete record in detail must be kept of the cost of all alteration or repair work wherever work of this nature occurs in any part of the construction; also a detail of the estimated cost to reproduce any and all structures that may be torn down, removed, or otherwise destroyed shall be kept, and a report in full sent to the engineer or architect immediately.

A careful check should be kept at all times of the amount of money being expended, and if there is any indication of a likelihood of the amount authorized being exceeded, notice thereof shall be given the engineer or architect immediately.

Financing Public Service

President Gadsden Shows Relation of Credit Restoration to Rate Adjustment, Delayed Due to Lack of Knowledge by Public—Says Utilities Should Give Full Explanation in Understandable Terms

URGING a complete, simply worded program of public information, with all facts disclosed as a means of restoring credit, President P. H. Gadsden of the American Association addressed the Indiana Public Utilities Association, at Indianapolis on Jan. 13, on the subject of "Public Service Financing." After reciting the war troubles which led to the appreciation of the necessity of public utilities and of the mutual dependence of all industries and emphasizing the financial straits of utilities in spite of this, he pointed out the layman's difficulty of understanding this when he sees other industries prosperous. He then proceeded to outline the situation as follows:

"It is only natural when a business is in difficulties that one should look first to the management to discover if therein lies the chief trouble. To such an investigation the public utilities of the United States can freely submit themselves without fear of the result. While there may be, and doubtless are, isolated cases of bad management in the business throughout the country, for, indeed, no industry's management is 100 per cent perfect, it is safe to say that on the whole the public utility properties are managed with as high a degree of efficiency as any other lines of business in the world. Hence they must be discharged on that count.

"From considering the management it is a very natural step to the cost of supplies, and turning to them we find that the coal, oil, rails and other supplies of public utilities are purchased in the same market as are those of other industries and at the same price. It follows then that here is no unusual situation.

"Again it is not a lack of business that is to blame for the public utility situation because the demands on their facilities never have been greater. Electric railways have all the traffic that they can carry. The demands on gas, electric light and power companies are unprecedented, and from every section of the country comes the declaration that the capacities of telephone and telegraph companies are severely taxed and that obtaining a sufficient quantity of new supplies to handle new business is one of their greatest problems.

REGULATION INTERFERES WITH LAW OF SUPPLY AND DEMAND

"In the face of this situation, then, it is obvious that there is some one thing which differentiates the public utilities from other classes of business. Somewhere there is a difference in operation which has created the broad and gradually widening chasm between prosperity and ruin. To the practical public utility operator the cause is plain.

"It is the regulation of public utility rates that is the basic cause of their troubles.

"The laws of supply and demand which normally should regulate public utilities are artificially interfered with. The natural operation of these laws are so checked and diverted that they operate only on the expenses of public utilities and not on their receipts.

"It is unfortunate, but it is true, that the fact that public utility rates have been fixed by commissions and not by the law of supply and demand has gradually impressed the public with the idea that the whole field of public utilities is removed from the operation of economic laws."

Tracing the rise in prices of all supplies and the necessary rise in labor prices, Mr. Gadsden said that proportionate advances in rates should have been made simultaneously, and then proceeded to say:

"The results of this inequitable advance in payment for services rendered has been that public utility companies throughout the United States today are in financial difficulties and many street railway companies are in bankruptcy. Credit of gas companies is greatly impaired and it is with the utmost difficulty that new money can be obtained to make the necessary and required extensions which every gas company must make continuously if it proposes to give good service to growing communities."

As a cause for what he termed "this chaotic situation," Mr. Gadsden pointed to the rigidity of the present system of regulation. This, he said, is a defect. The system is devoid of easy flexibility which would enable it to meet emergencies such as those created by the war.

COMMISSIONS HAVE RESPONDED ABLY

"The trouble lies very largely in the system itself and is not the fault of the commissions that regulate public utilities. The Public Utilities Commissions of this country are filled with honest, capable, conscientious men who are striving diligently to do their utmost to relieve public utilities of their great and sometimes seemingly insurmountable problems. Generally speaking, these commissions have responded to the very best of their ability to the demands of the situation. But the fault in the regulatory system lies beyond their power to remedy.

"The great need in the public utility field today is credit and this need links up directly with rate adjustment.

"It is absolutely necessary if public utilities are to continue to function that they must establish new credit and create a flow of new capital into their securities. The answer to this whole problem is the granting of rates to public utility companies which will insure a return to the security holders that will induce them to invest. Nothing less than this sort of an arrangement will save the public from ruin.

"Adjustment of public utility rates to a basis that will attract new money into the field will be hastened by a thorough public understanding of the public utility problems.

"The best way to bring about that understanding is to be frank and advertise.

"Frankness must go hand in hand with advertising else advertising fails. Therefore, be prepared, when you begin presenting your story to the public, to tell the whole truth about your business to every one. As the only customer of the public utilities, the public is entitled to know all about their business, and any public utility which cannot stand the searchlight of honest public inquiry cannot hope to obtain help through favorable public sentiment. Put your house in such order that you will fear the questions of no man.

"Advertise by every possible channel and hit the line hard. Tell your story in electric railway car cards, in the display advertising columns of the daily newspapers, through your employees—tell it everywhere that there is blank space which you can fill.

"Present your facts simply, frankly and honestly. Make it plain that the public utility problem is the problem of every man, woman and child who uses your service. Strive by frank statement to convince consumers that you are trying to do the best thing for their general good and that in their own selfish interest, if nothing else, they should interest themselves in your efforts. The way to accomplish this result is not to make the flat statement that this is your intention, or to submit to the public a large indigestible volume of statistics, and then sit down and wait for the millennium. The thing to do is to explain your situation in understandable terms to just as many folks as possible. If you have a good case, as most public utilities nowadays have, and you will tell the whole truth about your situation in a simple and convincing manner and give it deserving circulation through the best available advertising medium, you are certain to rally the public to your support."

Fighting Snow on the Milwaukee

Division Master Mechanic in Charge of Equipment on the Rocky Mountain Electrification Tells How the Track Is Kept Open—Snowslides Are the Greatest Enemy of the Snowplow

ONE advantage of the electric over the steam locomotive in cold and snowy climates is the greater ease of keeping the tracks clear of snow. This, among other points, is explained in the current issue of the *Electric Journal* by E. Sears, division master mechanic Chicago, Milwaukee & St. Paul Railroad. He states that a moderate depth of snow, 4 to 5 ft., unless it is heavily packed, and even greater depths extending for only a short distance, can be removed most easily by means of the wedge type snowplow. The railroad has a number of double mold board Barr plows of this type, which are placed ahead of loaded ballast cars and driven at high speed through the snow by two or three locomotives. These are usually able to take care of the snow situation in the Rocky Mountains, as the snow does not usually attain as great depth in this territory as in the coastal ranges. When fighting snow in this manner the members of the crew are continually wet from the snow which is melted by the heat of the locomotives. Snow is necessarily shoveled into the firebox with the coal, making steaming difficult. A considerable gang of laborers with snow shovels is usually carried for use in emergencies.

For deeper snows the railroad employs six rotary plows, mostly in the Bitter Root and Cascade Mountains. The plow is pushed ahead of the locomotive, boring its way through the snowbanks. The rotary wheel is about 12 ft. in diameter. It is faced with knives, which cut into the snow; this is thrown by centrifugal force out of the chute at the upper part of the housing. The snowslides are the greatest enemy of the snowplow in the mountain district, as they cover the tracks to considerable depths; at times they catch a plow and bury it completely. In one case one of the electric locomotives without a rotary plow attached ran into a large drift and several visiting electrical engineers who were on the locomotive were entirely buried in the snow, which forced itself through the broken windows and filled the cab.

Prior to the electrification, as many as three or four steam freight locomotives were placed behind the rotary plow. Now the rotaries are handled by one electric locomotive and, inasmuch as each half of the present freight locomotives, when not coupled to the other, can be run as a separate unit, only one unit of the engine is sometimes employed, although in heavier drifts both units can be cut in, giving full power to push the snowplow.

The heavy snowfalls do not interfere with the electrical operation over the mountain territory as much as they did with steam, since an electric engine will plow through snow where a steam engine will not go. The heavy snows have no bad effect on the overhead wiring. At times heavy frost collects on the two No. 0000 copper trolley wires. With a pantograph of the double-shoe type, sliding on two trolleys whose hangers are spaced alternately, excellent current collection is obtained at all times and sleet and frost have not so far caused trouble to any extent. Sometimes during heavy frosts both pantographs are raised, the front one serving principally to clear the wires.

Experience indicates that snow fighting can be done better with electrical equipment than with steam. The electrical equipment gives better speed control, as there is no difficulty in securing all the power desired and there is no opportunity for the freezing up of injector pipes, etc., on the locomotive, or necessity of having to go back for water or fuel, except to meet the fuel and water demands of the rotary plow itself.

The only change necessary to adapt the rotary snowplow to use in the electrified territory was the attaching of a deflector on the upper part of the rotary hood, so that the snow and other material, when thrown out, would not come in contact with the power limiting and other wires. These are at such a height that a rotary, in its original condition, would throw the snow onto the wires, and trouble was experienced from this cause when the rotaries were first operated in the electrified section.

Mr. Sears concludes with the statement that, no doubt, in the near future rotary snowplows will be built with electric motors instead of steam engines for electrified territory, and the old ones will be changed over for electric operation. The only drawback to operating the plow itself with motors is that quite often the rotary wheel will freeze, in which case it is necessary to have steam available to thaw it out. This difficulty could be overcome by using a small boiler similar to the ones which are now being used for heating the passenger trains.

New England Club Meets

TWO meetings were held at the American House in Boston by the New England Street Railway Club on Thursday, Jan. 6.

In the afternoon Col. Thomas F. Sullivan, former roadmaster of the Boston Elevated Railway and now Commissioner of Public Works, city of Boston, gave a short talk on "Snow Fighting." There followed a discussion of some length on this subject by various railway managers of New England roads, after which dinner was served. The evening meeting was in the nature of a reunion. Many of the past-presidents of the club were present and gave short talks on the growth and accomplishments of the club during its twenty years of existence.

Shop, Track, Power and Line

These Articles and Ideas Are from Men on the Job Who Find Special Applications and New Methods an Incentive for Greater Effort — If You Have Something Good Pass It Along

Broken Switch Casting Reclaimed by Electric Arc Welding

An Ingenious Method of Repair Used by the New York Railways on a Broken Switch Casting Which Made It Practically as Good as New and Accomplished It at a Substantial Saving

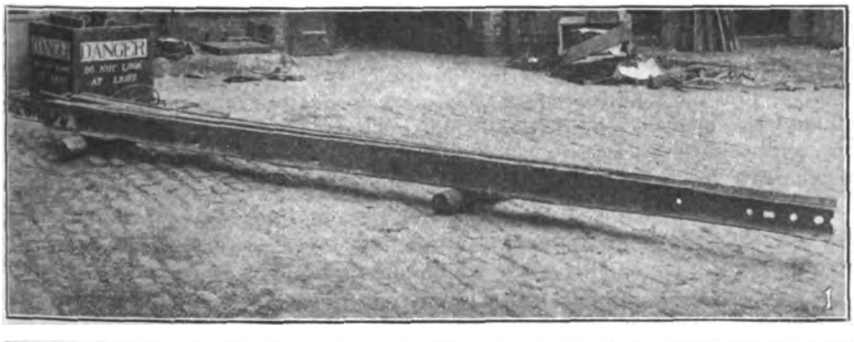
By A. McGregor
Chief Engineer Arc Welding Machine Company, New York

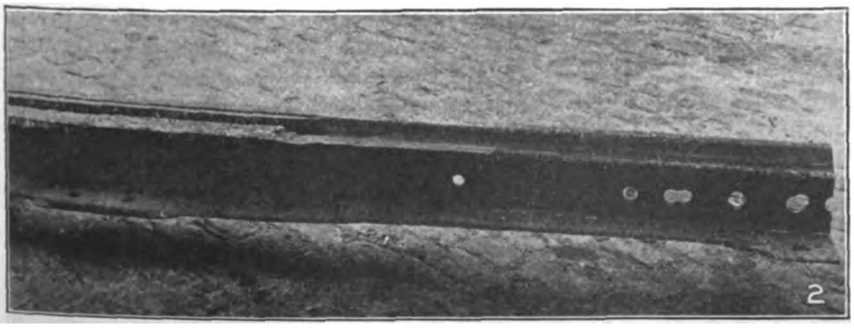
A RIGHT hand standard switch casting which had seen service on the New York Railways system as a one way switch at Fifty-ninth Street and Sixth Avenue for a number of years finally became so badly worn and broken that it had to be removed. It was found that at a place about half the length of the switch point, where the car wheel started to bridge the switch tongue and the running rail, to the end of the casting the running rail was worn to a maximum depth of approximately ⅞ in. At the end of the casting the splice plates were broken, and the rail had been so weakened by wear that the head of the running rail was broken off for a distance of 27 in. from the end. A somewhat similar condition was found at the heel end of the casting. Not only was the head of the running rail worn and a section 20 in. long broken off but the gage line of the running rail was also worn away for approximately ¾ in.

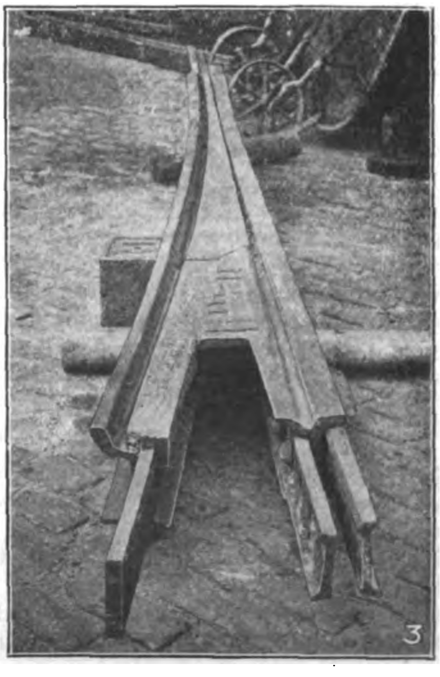
A short time ago this casting would have been scrapped. In fact, some of the less progressive roads still scrap such sections, but the maintenance of way department of the New York Railways was equal to the occasion. It removed the section to the yard and by using an electric arc-welding machine built for it by the company with which the writer is connected, it not only reclaimed the casting, making it practically as good as new, but also accomplished it at a saving of approximately $350.

Method Used for Repairs

It was interesting to see the ingenious manner in which the repair was made. At both ends where the running rail was broken a steel plate 1 x 5 in. was arc welded solid to the web and another piece of steel 1 x 2 in. was arc welded to the top edge of the plate to form the head of the rail. The plates were prepared long enough so that they extended approximately 16 in. beyond the end of the rail, thereby forming a splice plate on one side of the web at each end.







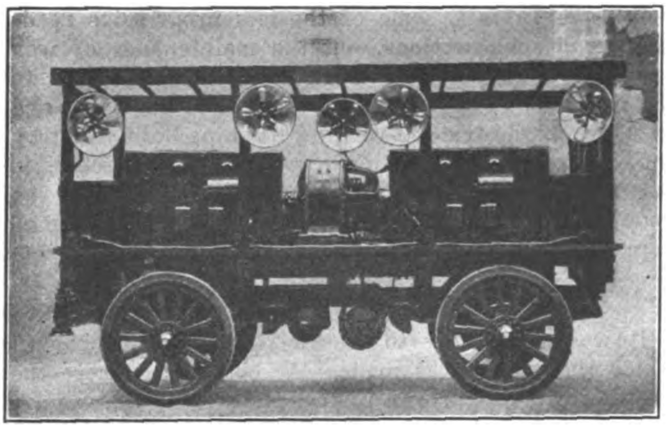
No. 1. Switch casting reclaimed by electric arc welding.
No. 2. Toe end of casting. showing section of running rail, 27 in. long broken off. Also showing worn section of running rail built up by the electric arc (partly finished).

No. 3. Heel end of casting, showing how worn and broken section was repaired. Note the steel plate which forms the head of the running rail and also the splice plate. Observe how the gage line of the running rail was brought back to normal.

COST OF RECLAIMING BROKEN SWITCH CASTING

Cost of new casting complete		$500.00
Cost of repairing old casting.		
51 hours welding 18 hours grinding	$42.78	
35 lb. 3/16 in. electrodes (hard steel)	14.35	
40 lb. 3/16 in. electrodes (mild steel)	7.40	
200 lb. 1 in. x 7 in. rolled steel plates	20.00	
30 cu.ft. acetylene for cutting	.90	
100 cu.ft. oxygen for cutting	1.30	
New switch tongue	78.00	
		$164.73
Actual saving by electric welding	$335.27	

The top and inside edges of the plates were built up with steel by means of the electric arc, until the head of the rail was brought back to normal. For a depth of approximately ⅜ in. from the top a layer of special hard grade steel was used. Where the rail was worn but not broken the surface was built up with mild and hard steel, until, after grinding, all sections were brought back to their original dimensions. No attempt was made to weld the switch tongue. It was simply replaced with a new one. The switch casting was made by the Lorain Steel Company. The center section of the rail is of manganese steel and is keyed into the steel casting.



PORTABLE TWO ARC ELECTRIC WELDING MACHINE USED BY THE NEW YORK RAILWAYS

The writer was informed that this is only one of a number of cases where the use of electric arc welding has saved the company considerable money and lengthened the life of equipment. At some crossings the company has replaced worn and broken manganese hard centers with special forged tool steel plates, arc welding the plates in place. At another location where a long section of the rail had been broken out, and where the expense of removing the pavement to replace the rail would make its replacement costly, it was found that with the aid of the arc it was able to graft a new section of rail in place without disturbing the pavement to any great extent, consequently adding another achievement to its credit.

High-Speed Tool Steel

MODERN high-speed tool steel is a high alloy, the essential contents of which are within the following limits: Carbon, 0.5 - 1.0 per cent; tungsten, 12 - 20 per cent; chromium, 1.5 - 6.0 per cent, and vanadium, 0.5 - 2.0 per cent. Tool steel has several unusual characteristics peculiar to itself which are intimately connected with its treatment and utility. To obtain its best properties by hardening, it must be heated to an excessively high temperature such as would ruin simple steels. After this treatment tool steel will not lose its hardness on tempering until heated above a dull red heat. This valuable property explains its great superiority over carbon steels, which begin to lose hardness appreciably on tempering at 200 deg. C., while for high speed steel this loss does not occur until about 700 deg. C. is reached.

Construction of Dry Kilns

BASED on the experience of the United States Forest Products Laboratory the following notes have been prepared for the benefit of all users of wood. The notes regarding dry-kiln construction will be particularly suggestive to electric railway master mechanics.

Where insurance rates permit, a well-built wood kiln is very satisfactory, wood being a very good insulator, easily repaired and cheaper than the other materials. The chief objection to the use of wood, aside from fire risk, is its tendency to swell and shrink with alternate moist and dry conditions, causing more or less working of the frame and loosening of nails. All lumber should be thoroughly seasoned. Fir, Douglas fir, yellow pine, redwood, cypress and similar woods with low shrinkage rates should be used for sheathing and sills. For frame timbers any good straight-grained material is suitable. The sheathing should be shiplap laid horizontally and nailed twice at each stud, in the middle and at the bottom of the board. Outside walls should be sheathed on both sides or sheathed inside and plastered outside. They should also be insulated with a good moisture-proof, heat-resistant insulator. The ordinary quilt insulations sewed between so-called waterproof paper have not proved satisfactory in dry kiln construction. Walls should be painted on the inside with asphaltic paint. Where lumber is plentiful, crib or laminated construction may be used, the walls being built up of 2 by 6-in. planks laid flat, and the roof of similar material laid tight together. If the planks are well seasoned and well manufactured this form of construction permits very little heat loss, but if the lumber is low grade and knotty a tight, weather-resistant construction is extremely difficult to obtain. The shrinkage of the walls is excessive and causes considerable trouble at door jambs and where pipes pass through the walls.

Brick or hollow tile is procurable almost everywhere, and where permanency is desired is usually more satisfactory than wood. The brick or tile should be hard burned. The walls should be laid up in tempered or cement mortar. Unequal expansion in the exterior walls, caused by the difference in temperature of the outer and inner faces, is almost certain to create numerous small cracks, which should be painted up with an elastic cement rather than mortar. A kind of tile should be chosen that has openings running horizontally rather than vertically in the wall. The tile should be scored for plastering. Both sides of tile walls should be plastered with cement mortar. When brick, tile or concrete kilns are more than 50 ft. long it is advisable to build both the exterior and interior walls 12 in. thick, particularly if fireproof roofs are used.

Walls of monolithic concrete or of concrete blocks are highly absorbent of moisture unless thoroughly water-proofed. It is very difficult to hold a high humidity within a kiln whose walls absorb moisture readily. The heat loss through such walls is also very great.

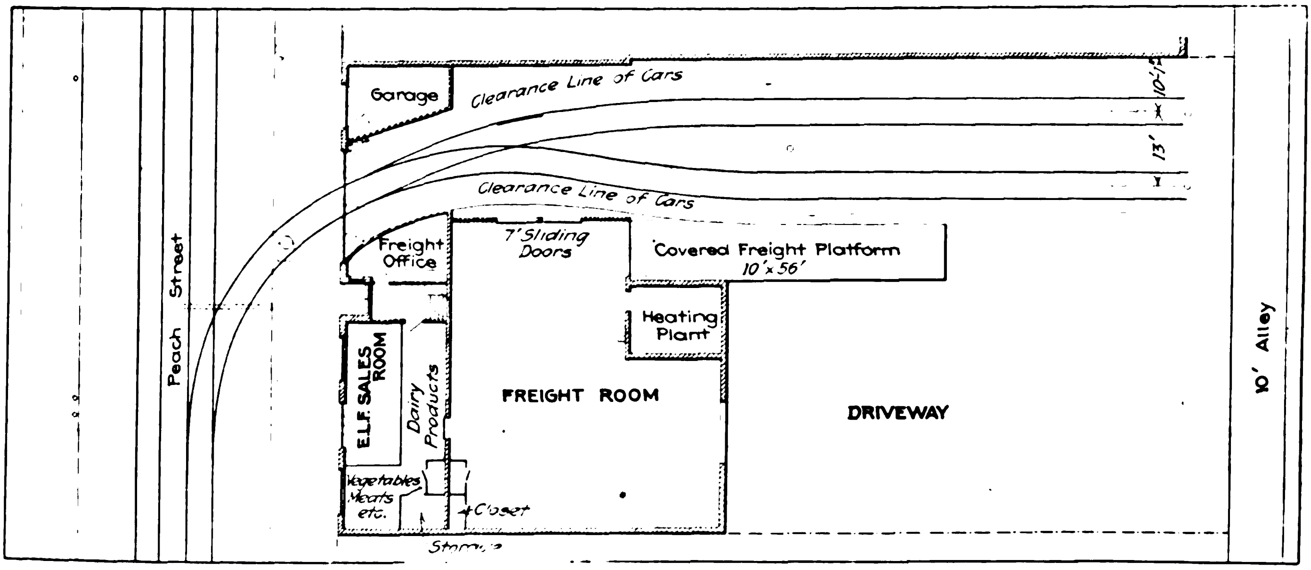
In comparing the above types of kilns the choice will depend upon the relative importance of the first cost, maintenance and fire hazard.

Interurban Freight Terminal Opened

Modern Facilities Result in Improved Service and More Efficient Handling and Delivery of Freight in New Terminal of the Northwestern Pennsylvania Railway in Erie

FOR several years prior to 1916 the interurban freight business of the Northwestern Pennsylvania Railway and of the Cleveland & Erie Railway in Erie, Pa., had been conducted in cramped quarters in a small storeroom on Peach Street. Both inbound and outbound freight was handled in this outgrown and obsolete terminal building. Freight cars were stopped on a passing siding near the center of the street and all freight was hand-trucked across the sidewalk between the car and the building. This arrangement was a nuisance to both pedestrians and drivers of vehicles and the cost was all out of proportion to the work done. The volume of business demanded facilities for handling freight more economically and plans were adopted with that end in view. A formal request was made of the City Council for a permit to install and operate a switch from the main track in the street across the sidewalk into the proposed freight terminal and a lease of adjoining property necessary for the execution of the plans was obtained. The plan provided for a double-track layout of five cars capacity and a freight house of ample floor space with all freight handled through entrance and exit in the rear, where wide driveways afforded opportunity to load and unload at the rear freight house door, or along a covered platform, or directly from the car, as circumstances might make most convenient. However, this plan was not carried out at that time due to the refusal of the City Council to issue the necessary permit because of protests from adjacent property owners affected. After much controversy and through the aid of many business organizations that found themselves deprived of necessary service, the Council finally passed the ordinance, which in due time was approved by the Public Service Commission, and on Oct. 21, 1920, the new freight terminal of the Northwestern Pennsylvania Railway was placed in operation.

This new freight terminal is a building on Peach Street, approximately 69 ft. x 56 ft., with a covered platform 10 ft. x 56 ft. extending from one corner parallel to the track extension which serves the terminal. In the opposite corner from the covered platform and facing the spur track is the freight office, while behind it and extending along the street is a room in which vegetables, meats, dairy products, etc., are handled. Cars can be loaded and unloaded through a door directly from the freight room or freight can be trucked onto the platform and then into the cars. In back is a spacious driveway for the receiving and distribution of freight from the covered platform.



PLAN OF FREIGHT STATION IN ERIE, PA.

Working Capital in Valuations

IN A supplement to the November issue of its publication, the *Annals*, the American Academy of Political and Social Science, Philadelphia, Pa., prints a paper by Dr. Delos F. Wilcox entitled "Working Capital in Street Railway Valuation."

Dr. Wilcox in this paper cites numerous cases of valuations of electric railway properties in which the subject of working capital has been considered and argued upon and in each case points out the fallacy of the arguments brought forward to sustain a working capital fund as a part of capital value when the working capital is figured or based upon the record of the company showing cash on hand from time to time. What Dr. Wilcox supports as the correct position with respect to working capital in street railway valuation is that the entire amount of money required in advance for the purchase of materials and supplies and for other prepayment is much more than offset under normal operating conditions by the accumulation of cash from the daily revenue collections in anticipation of the payment of deferred expenses, and that therefore a street railway company with a fully developed business and receiving from its patrons a revenue sufficient to cover the full cost of service is not entitled to any allowance whatever for permanent working capital as a part of the capital value to be taken as the basis for rate fixing.

Among the cases cited for analysis with reference to working capital are the valuation of the Pittsburgh Railways, the Cleveland Railway service-at-cost contract and operating record, the reserve fund in the

Boston service-at-cost act, working capital in the Bay State case, the Cincinnati reserve fund, various decisions of the Wisconsin, Illinois, Utah, District of Columbia and other commissions, and finally a detailed analysis of the Public Service Railway (New Jersey) valuation.

Swiss Railway Electrification Plans

AFTER the St. Gotthard line in Switzerland has been electrified, the State Railways will direct attention to the Vallorbe-Lausanne-Brigue line, assuring connection with France (via Dijon and Pontarlier) and Italy (via Brigue, the Simplon and Milan). *Le Génie Civil*, Dec. 18, states that the first step will consist of the introduction of single phase between Brigue and Lausanne, partly by changing over the present three phase between Brigue and Sion, and by electrifying the Sion-Lausanne section (57 miles). Power will be furnished by the Barberine hydro-electric station, located near Martigny, which will be completed in 1923.

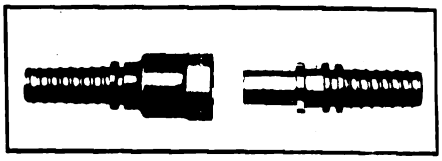
Light Portable Suction Cleaner

A HANDY portable suction cleaner for removing dust from places hard to clean has been placed on the market by the Air-Way Electric Appliance Corporation, Toledo, Ohio, under the name of "Air-Way Junior." It has a handle for convenient lifting by the left hand, a flexible cleaning hose, which is held in the right hand; a rubber cleaning attachment and brush holder, a brush, a fiber extension for cleaning corners, and an attachment for connecting the hose to the blower. While this was designed particularly for cleaning the interiors of automobiles and automobile establishments, the device can also be used for cleaning the interiors of electric cars.

OPERATING THE PORTABLE SUCTION CLEANER

New Type Hose Couplings

A HOSE coupling with several new features has recently been placed on the market by the Ingersoll-Rand Company, New York, N. Y. It is called the "Little David" Hose Coupling and will be distributed as an accessory to the line of "Little David" Pneumatic Tools manufactured by this company. Hose couplings which become leaky after short use are the cause of serious air losses, and another trouble commonly experienced with many couplings is jamming or sticking through some slight injury, making them difficult or almost impossible to connect or disconneet. The design of the "Little David" coupling has been with the view to overcoming these troubles. Its main features are sturdiness, simplicity and an all-around ability to stand all sorts of abuse.



NEW TYPE HOSE COUPLING

The coupling consists of two parts, male and female. The female end is fitted with a V-shaped rubber gasket providing an airtight joint. The gasket is prevented from blowing out by a protective shoulder inside the coupling should the coupling become accidentally disconnected under pressure. The locking shoulders are heavy with large bearing surfaces. The locking spring is strong and can be replaced if necessary. The parts are made of a metal not subject to ordinary rusting or corrosion.

The male end has a very liberal bearing in the female end and another feature is the absence of any outer sleeve exposed to injury. The air ports are straight and of uniform diameter.

The coupling may be connected or disconnected by a quarter turn. A groove in the hose end of each part allows using a hose clamp to attach securely to the hose. "Little David" Hose Couplings are manufactured in ½ in. and ¾ in. sizes, which are interchangeable; that is, a ½ in. male piece may be used with a ¾ in. female end or vice versa. Gaskets are also interchangeable between the different sizes.

Recorder for Both CO_2 and Combustible Present in Flue Gas

RECENTLY an instrument has been perfected and placed on the market by the Mono Corporation of America which not only analyzes and records the percentages of CO_2 present at all times in flue gases but also detects and clearly records on the same chart the presence and approximate proportion of combustible gases whenever they appear. It is claimed that a continuous indication of the percentage of CO_2 alone does not always give a true basis for determining combustion conditions, but that a continuous and simultaneous record of combustible gases present is also necessary. One of the prime purposes of this instrument, the Duplex Mono, is to detect the presence of combustible gases in the flue immediately upon their appearance and to record accurately the percentage of CO_2 present at that particular time. Very slight proportions of combustible gases are clearly recorded on the chart, giving warning of improper conditions and inefficient boiler operation.

Porcelain Tokens Used in Germany

ALL kinds of small emergency coins are now used in Germany. These are made out of sheet aluminum, zinc, iron or brass, but the most modern coin is made out of royal saxonian porcelain. Even this hard cash is rare and is substituted for by emergency paper money printed with more or less artistic taste by the large and small cities. This paper money is good only in its native city, so conductors must be extremely careful in accepting small paper money, and in order to facilitate payment of fares the Statt Cottbus Street Railway has isued some brass money of about $\frac{5}{8}$ in. diameter and with a $\frac{3}{16}$ in. center hole. This token can be purchased at the trunkline deposits, from a number of stores in the city and from the conductor. This token is good for one ride and saves trouble and time on the part of the motorman.

Comparison of Five Types of Glue

THE United States Forest Products Laboratory has furnished the accompanying table containing information regarding glue, which will be of interest to the master mechanics of electric railways.

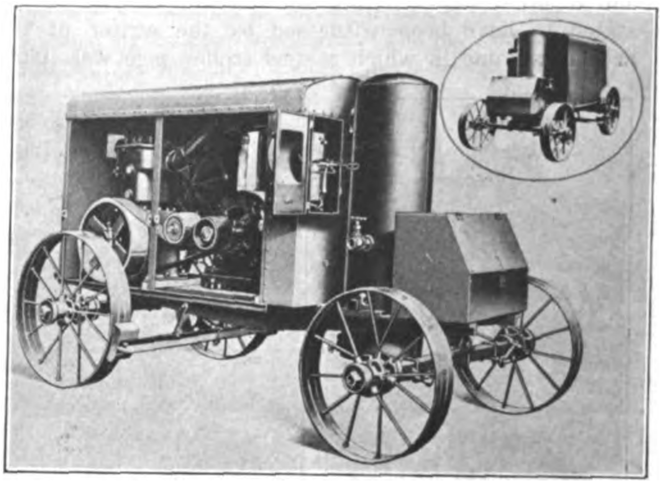
Particular Compared	Animal Glue	Casein Glue	Vegetable Glue	Blood Glue	Liquid Glue
Source	Hides, bones horns, etc.	Casein from milk	Cassava starch	Dried blood	Animal glue or fish parts
Cost per Lb. 1920	25–42 cent	16–20 cents	10–12 cents	20 cents	$1–$5 per gal.
Spread in Sq.Ft. per Lb.	25–35	35–55	35–50	30–100	No data
How Mixed	Soaked in water and melted	Mixed cold with rapid stirring	Mixed with alkali and cold or hot water	Mixed cold	No preparation
How Applied	Warm with brush or mechanical spreader	Cold with brush or mechanical spreader	Cold with mechanical spreader, not by hand	Cold with brush or mechanical spreader	Cold or warm usually applied by hand
Temperature of press	Cold, or with hot cauls	Cold	Cold	Hot	Cold
Strength (in shear test)	High grades stronger than strongest woods	Equal to medium grade animal glue	Equal to medium grade animal glue	High strength in plywood. Not used for joint work	Best grades equal to medium grade animal glue
Water resistance	Low	High	Low	High	Low
Chief uses in woodworking	For strong joint work	For water resistance plywood or joint work	For veneer work because of cheapness	For water resistant veneers	For repair work and small articles

Characteristics of Hardened Copper

TO CLEAR up much of the misunderstanding about hardening copper, the Bureau of Standards has issued a circular letter explaining the characteristics of and the methods for the hardening of copper. There are two well-known methods of hardening copper: One is mechanically to work it by hammering, cold rolling, drawing, etc., and the other is to alloy it with a small amount of another metal, usually zinc, tin, aluminum or iron. The alloyed metal is no longer copper, but should be referred to according to the chief alloying constituent. The misconception about the loss of the so-called art of tempering bronze is made clear by the statement that any hardness of the cutting edges on knives or swords made of copper and bronze was obtained by hammering and not by any method of tempering. Any bronze today can be made as hard if not harder than that of prehistoric times by hammering alone.

New Portable Compressor Outfit

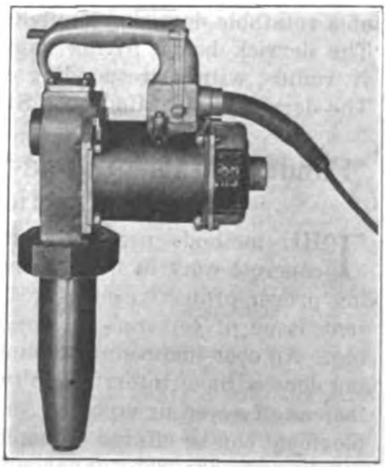
THE Ingersoll-Rand Company has recently added an electric motor-driven portable compressor outfit to its line of "Imperial" compressors. This unit is of 118 cu.ft. capacity and weighs approximately 4,450 lb. It is of all-steel construction, and steel doors at the sides provide easy access to the operating equipment and afford protection from the weather. A suitable intake unloader is provided for regulation. Either alternating or direct current motors can be supplied as desired.



PORTABLE ELECTRIC DRIVEN COMPRESSOR OUTFIT

Electric Hammer Drill

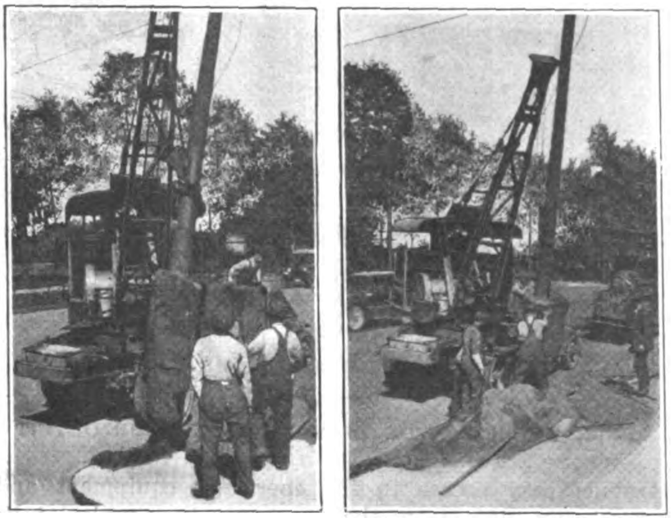
A NEW type of drill, called the Little Giant Electric Hammer Drill, is now being manufactured by the Chicago Pneumatic Tool Company. It is most suitable for drilling concrete and soft stone and for light chipping of metals. A motor designed for either direct or alternating current runs the drill. The hammer blow which is delivered by a piston on the drill steel or chisel is produced by a pneumatic impact. At the instant the blow is struck the piston is running free of all mechanical parts, and therefore no shock or vibration is transmitted to the electrical parts of the tool. This means that there is no tendency for the electrical wire or connections to become crystallized due to incessant jarring. The switch is conveniently located in the handle for control of the electric circuit. All bearings are of the ball type, provision



ELECTRIC HAMMER DRILL FOR LIGHT DRILLING AND CHIPPING being made for the lubrication of all revolving and reciprocating parts. The gear and those portions of the moving parts subject to wear are all hardened. A special feature of this drill is the live air device for clearing the hole of the cuttings.

Moving Trolley Pole with Concrete Setting

IN THE issue of the ELECTRIC RAILWAY JOURNAL for Sept. 25, 1920, page 584, mention was made of the use of the "International" truck crane, made by the International Crane Company, in moving trolley poles and in other heavy lifting and carrying work. A job stated to have been witnessed by the writer of the article was one in which a steel trolley pole was lifted with a mass of concrete around its butt and dropped into a hole some yards distant, the whole operation requiring but a few minutes after the machine reached the work. The load lifted in this case weighed about 1 ton, and only a foreman and two other men were required on the ground with the derrick man and the chauffeur on the truck. The accompanying photographs of this job have been taken to give a more concrete idea of the operation. The International crane consists of a rotatable derrick, mounted on a 7½-ton Mack truck. The derrick has a lifting capacity of 6,000 lb. at 12 ft. radius, with corresponding capacities of other radii. The derrick is operated by a Stearns engine.



UTILIZING A TRUCK CRANE FOR MOVING A TROLLEY POLE IN CLEVELAND

Fundamentals of Cold-Weather Concrete Practice

THE methods used by contractors for continuing concrete work in spite of low temperatures by applying proper protective measures is discussed in the current issue of *Concrete in Architecture and Engineering*. An ever-increasing amount of concrete work is being done without interruption twelve months in the year, instead of seven or eight as formerly. Thus steady employment can be offered to employees and overhead costs can be reduced. The fundamentals of cold-weather concrete practice are storing the aggregates in advance under shelter to prevent their freezing into a solid mass, heating materials enough to give required warmth to the mixture, speedily transferring the mixture to the forms, and protecting the concrete from loss of heat while hardening by a temporary canvas shelter and by fires.

Steam Railroad Statistics

THE statistical report of the railways under the jurisdiction of the Interstate Commerce Commission for the year ended Dec. 31, 1918, has just been published. It shows a total of 1,849 roads, with 253,528 miles of line owned and 264,233 miles of road operated. There are 8.53 miles of track for each 100 square miles of territory and 24.02 miles of track for each 10,000 inhabitants. At the close of 1918 seventy-four roads with 16,805 miles owned were in the hands of receivers.

All of the companies in the country had 67,563 steam and 373 electric locomotives, 2,427,460 freight cars, 56,611 passenger cars and 105,192 service cars. The employees numbered 1,837,663. The capital outstanding, not including securities of inactive or of switching and terminal companies and excluding also securities held by other railway corporations, amounted to $16,454,339,035, of which the stock represented $6,732,728,684 and the unmatured funded debt $9,722,060,351.

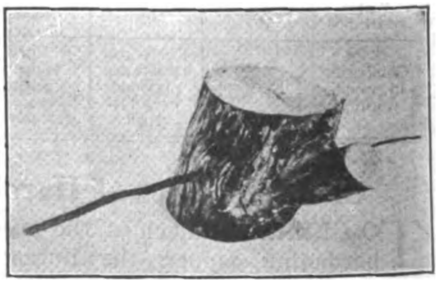
Gasoline-Propelled Trains in India

THE whole service of the Nasik tramways in India is furnished with four gasoline-driven cars, each equipped with a 45-hp. four-cylinder motor. The change-speed gear box is arranged so that it is foolproof even to the most unskilled driver. There are two speeds in both directions and two operating levers, one for speed changing and the other for reversing. The planetary system of gear changing does not involve the disengaging of any of the toothed wheels, which are always in mesh, as it is effected by engaging a clutch plate with either of the two driven members. Reversal is effected by engaging one of two bevel gears, driven by one pinion, with a dog clutch on the shaft.

Tree Grows Around Wire

THE accompanying illustration shows a 110-volt distribution wire passing through the center of a limb of a tree. The wire was not deliberately placed in that position, but is the result of the wire rubbing against the limb and of the limb eventually growing around the wire. The limb appears to have a growth of approximately nine years.

This unusual condition was found by the trouble gang of the British Columbia Electric Railway, Ltd., Vancouver, B.C., when inspecting the distribution lines recently. A property owner had pruned the trees on the boulevard in front of his house on Nichola Street and finding the above condition to exist had simply cut the limb above and below the wire and left that portion of the limb shown in the illustration suspended in the air. When the trouble gang found it, it cut the wire on each side of the limb and turned the specimen in to the office to confirm the necessity of its application for an appropriation to cover the cost of pruning trees that were damaging or interfering with the company's distribution system.



UNUSUAL CONDITION FOUND ON DISTRIBUTION SYSTEM

American Association News

AS DATE OF MID-YEAR CONFERENCE DRAWS NIGH, ELECTRIC RAILWAY INTEREST IS FOCUSED ON FINANCE, THE TOPIC SELECTED FOR SPECIAL TREATMENT —PRESIDENT GADSDEN ALSO URGES SPECIAL ACTION REGARDING F. E. R. C. REPORT

Mid-Year Conference and Dinner

at Chicago, Ill., Feb. 10, 1921

SUBJECT:

Electric Railway Financing

Papers at the Mid-Year Conference

THE committee on subjects, of which J. D. Mortimer is chairman, has made public the following details of the subject matter to be treated in the papers at the Chicago convention:

"Previous Methods of Electric Railway Finance," by James F. Fogarty, secretary the North American Company, New York. This paper will give a summary of the changing methods of financing capital improvements from the days of early electrification down to the present, with reasons therefor; influence of low rates of return on such methods, as disclosed by the large proportion of capital securities represented by interest-bearing debt; influence of the holding company and probable future; war-time financing; post-war financial methods.

"Present Requirements for Mortgage Securities," by F. K. Shrader, Halsey, Stuart & Company, Chicago. In this paper Mr. Shrader will give an analysis of what competition requires in the way of relation of cash invested to amount of loan; influence of previous history on electric railway investments; margin of earnings over interest charges; flexibility of mortgage provisions; necessity of ample stable earnings as a condition precedent to re-establishment of credit to be derived from automatic regulation or cost-of-service franchises; characteristics of interest bearing securities which the general market is likely to absorb during the next year or two.

"Home Town Financing—Partial Mutual Ownership," by S. B. Way, vice-president and general manager the Milwaukee Electric Railway & Light Company. This paper will describe the desirability of large local interest being held by car riders; influence on local regulatory ordinances, etc.; cost of capital procurable by this means; methods of distribution.

"Necessity of Financing by Sale of Capital Shares," by Chester Corey, vice-president Harris Trust & Savings Bank, Chicago. Mr. Corey in this paper will point out the importance of providing for return on new capital that will invite the investment of new money through the purchase of issues of capital stock; requirements in the way of franchises or methods of regulation which will support such plans of financing.

"Municipal Aid in Electric Railway Financing," by Melvin A. Traylor, president First Trust & Savings Bank, Chicago. This paper will give the conditions under which municipal co-operation is required; moral support and abandonment of the street railway as a political issue; pledge of municipal credit through guarantees; municipal aid for rapid transit in construction of subways and elevated lines.

Ladies to Dine and Dance

ARRANGEMENTS have been made with the Hotel Drake for serving a special table d'hôte dinner to the feminine guests at the mid-year conference in Chicago, Feb. 10. This will be served in one of the private dining-rooms on the mezzanine floor adjoining the main dining-room in which the banquet of the railway men will be held. It has a little balcony and doorway opening out over the main dining-room so that the banquet music will also entertain the ladies.

After dinner the ladies will proceed to the Aisle of Palms, which extends along the main dining room about 3 ft. above it, and is separated from it only by a low balustrade. From this position they will be able to hear and see the speakers and entertainers to good advantage.

After the banquet and addresses have been completed, there will be dancing in the Aisle of Palms, with music furnished by another orchestra. The sub-committee on ladies' entertainment, of which John Benham is chairman, has thought it unwise to make any definite arrangements to entertain the ladies during the one-day convention. The Drake is so readily accessible to the great shopping center of Chicago by taxicab and by the buses of the Chicago Motor Bus Company, which pass the door frequently, that the committee thought the ladies would more than likely prefer to entertain themselves in the shopping district during the day.

However, these same buses run north along Lake Shore Drive for a distance of eight miles and pass the Edgewater Beach Hotel, which is one of Chicago's unique attractions. If the weather favors, it may be that some special arrangements will later be made for a drive up the lake shore through Lincoln Park and to the Edgewater Beach Hotel.

New York Delegation Going to Chicago Meeting via Broadway Limited

THE mid-year conference committee on transportation for New York and vicinity, of which Carl H. Beck, Westinghouse Electric & Manufacturing Company, is head, has completed transportation arrangements for those who plan to attend the Chicago meeting. The party will leave New York at 2:45 p.m., Feb. 8, via the "Broadway Limited" of the Pennsylvania Railroad and arrive in Chicago on the following morning. Special cars will be attached to this train unless the delegation is sufficiently large to warrant the operation of a special train.

The following letter, which is being sent by the committee to all members of the Association, gives full details:

The mid-year meeting and dinner of the American Electric Railway Association, to be held in Chicago, Feb. 10, is to be one of the most important meetings in the history of the Association.

Circumstances brought about through the rapidly changing conditions incident to post-war readjustments are such that railway men and manufacturers should give more than ordinary attention and support to this occasion. Now is the time to put an optimistic punch into the affairs of the industry. The subjects to be covered at the meeting, as well as the speakers and subjects at the dinner, are being announced through other channels, from which it can be observed a most complete program is arranged.

Your committee on transportation, charged with the duty of securing transportation accommodations from New York and vicinity, has selected the Broadway Limited, via the Pennsylvania Railroad, on Tuesday, Feb. 8, as the train and date accommodating the greatest number desiring to make this trip to Chicago. This train leaves New York at 2:45 p.m., arriving at Chicago at 9:40 o'clock the following morning, and it is now hoped to join with delegates from Philadelphia, Baltimore, Washington, Harrisburg, etc., in making this trip.

Accommodations can be secured by application to E. B. Burritt, secretary American Electric Railway Association, 8 West Fortieth Street, New York City, accompanied by New York check to his order, or similar funds, in accordance with the following schedule:

Lower berth, including all transportation charges, one way, $55.37.

Upper berth, including all transportation charges, $53.43.

Compartment, two tickets required, including all transportation charges, $118.84.

Drawing room, minimum two tickets required, including all transportation charges, $125.32.

Extra for third person in drawing room, $45.65.

Reservations for the return trip can be secured by expressing a desire for them at this time. A representative of the railroad company will be on hand at Chicago to take care of the details, but it is recommended that advance reservation be made to insure adequate accommodations for all those desiring to return from Chicago.

An endeavor is being made to arrange through the Central Passenger Association for reduced fare for the return trip. The results of this endeavor will be announced shortly.

Replies to this communication making reservations, must be in the hands of the committee by Saturday, Jan. 22, in order that suitable Pullman accommodations may be secured.

Be on hand. Bring all the enthusiasm you can collect; if you haven't any, somebody else will have it. Travel with the bunch.

Very truly yours,
C. H. Beck, C. B. Keyes,
Ross Hayes, Thos. L. Langan,
C. R. Ellicott, Chairman,
Sub-Committee on Transportation, New York and Vicinity.

Executive Committee Holds Busy Meeting

A MEETING of the executive committee of the American Association was held at New York headquarters on Friday, Jan. 7, with most of the members of the committee in attendance. The committee had an extensive program before it for consideration and accomplished a great deal of work.

Approval was given to the amendment to enlarge the executive committee from fourteen to twenty, as proposed by President Pardee at the Atlantic City convention. It will thus be voted on at the mid-year conference in Chicago on Feb. 10.

The committee approved the support of an appropriation by Congress of $50,000 for the Bureau of Standards to pursue electrolysis investigation. It was brought out that the bureau and the association are working in close co-operation on this subject.

Secretary Burritt presented the financial statement for the year ended Oct. 31, 1920, together with a statement of expenses of the 1920 convention, and also his budget for the fiscal year ending Oct. 31, 1921, all of which were approved by the committee and ordered published in the Transactions.

Fifteen companies were ordered reinstated on payment of last year's dues, making the total now 344 railway companies, 246 manufacturing companies, 890 individual members, and 1,250 company section members.

Charles L. Henry was given a vote of appreciation as chairman of the national relations committee for the work that he and his committee have done in connection with the Railroad Labor Board decision on interurbans recently rendered at Chicago.

Reports of several committees were received and also the report of the Bureau of Information and Service outlining its activities for the last three months and listing the bulletins issued.

President Gadsden announced the personnel of the committee to bring in a report to the mid-year conference on the Federal Electric Railways Commission report and the report of the Special Commission on Public Utilities of the United States Chamber of Commerce, as follows: Walter A. Draper, Henry G. Bradlee, Thomas S. Wheelwright, Arthur W. Brady, John J. Stanley, Lucius S. Storrs, James P. Barnes, J. H. Hanna, J. D. Mortimer, J. K. Newman and Britton I. Budd.

He also appointed the following as the locations committee for the next convention: John G. Barry, chairman; Charles L. Henry, H. D. Shute, B. A. Hegeman, J. J. Stanley, J. N. Shannahan, W. H. Sawyer, D. B. Dean, and the following members of last year's exhibits committee: F. H. Gale, H. Fort Flowers, F. J. Dell and J. B. Kilburn.

The committee adjourned to meet at the Drake Hotel in Chicago on Feb. 9, the day preceding the mid-year conference.

Consideration of Federal Report Urgent

PRESIDENT P. H. GADSDEN looks upon action by the association on the report of the Federal Electric Railways Commission and the report of the special committee of the Chamber of Commerce of the United States as one of the most important matters scheduled for consideration at the Chicago conference. Nothing that the Association can do, in his opinion, will be more helpful than to place itself squarely upon record before the public in this matter. This statement is contained in a letter sent by him under date of Jan. 12 to the executives of member companies and accords with opinions expressed by him in the interview with him which appeared on page 6 of the issue of this paper for Jan. 1, 1921.

The letter of Mr. Gadsden to the executives of member companies follows:

American Electric Railway Association

Jan. 12, 1921.

To Executives of Member Companies:

Dear Sir: I want to urge you personally, as strongly as I can, to have your company represented at the Mid-Year Conference of the Association at Chicago, February 10, when a special committee will present a report on the recommendations made in the report of the Federal Electric Railways Commission and the report of the special committee of the Chamber of Commerce of the United States.

No other utility has had the advantage of two such thorough investigations by impartial bodies, and the reports undoubtedly represent the opinion of the American public.

Up to this time, however, there has been no official expression of the Association's attitude with respect to the conclusions and recommendations contained in the reports, and it is believed that nothing the Association could do would be more helpful than to place itself squarely upon record before the public.

The special committee will present its report at the conference for discussion and appropriate action, which will make known to the public the attitude of the electric railway industry.

It is believed that nothing more striking or more helpful toward bringing about a better understanding on the part of the public could be done by the Association at this time.

For this reason every company member should be represented when the report is discussed and a resolution setting forth the Association's attitude voted upon.

This is so important that I want to urge you personally to be present at the conference and have as many of the officers of your company in attendance as possible.

While the general subject of electric railway financing, to be discussed at the conference, is of interest mainly to executives, it undoubtedly will prove of such a highly educational nature as to be extremely beneficial to subordinate officials as well.

I would appreciate word from you that you will make a special effort to attend the conference and participate in the discussions and whatever action the Association may take.

Very truly yours,
P. H. Gadsden,
President.

Personnel of Engineering Association Committees

IN THE issue of this paper for Dec. 25, page 1296, the full list of assignments to Engineering Association committees was given, together with the names of the chairmen of the several committees. At that date the personnel of the committees was not complete. It is now possible to give this as follows:

Committee on Apprenticeship Systems — F. R. Phillips, Pittsburgh (Pa.) Railways, chairman; L. C. Datz, American Cities Company, Birmingham, Ala.; H. A. Johnson, Metropolitan West Side Elevated Railway, Chicago, Ill.

Committee on Buildings and Structures — D. E. Crouse, Rochester & Syracuse Railroad, Syracuse, N. Y., chairman; E. H. Berry, Cincinnati (Ohio) Traction Company; B. R. Brown, Dallas (Tex.) Railway; N. E. Drexler, Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va.; H. V. Haulard, New Orleans Railway & Light Company, New Orleans, La.; B. P. Legare, United Railroads of San Francisco, Cal.; James Link, Knoxville Railway & Light Company, Knoxville, Tenn.; J. R. McKay, Indiana Service Corporation, Fort Wayne, Ind.; S. J. Steiner, Aurora, Elgin & Chicago Railroad, Aurora, Ill.

Committee on Equipment—Daniel Durie, West Penn Railways, Connellsville, Pa., chairman; W. S. Adams, J. G. Brill Company, Philadelphia, Pa.; H. A. Benedict, Public Service Railway, Newark, N. J.; J. C. C. Holding, Midvale Steel & Ordnance Company, Philadelphia, Pa.; H. A. Johnson, Metropolitan West Side Elevated Railway, Chicago, Ill.; T. R. Langan, Westinghouse Electric & Manufacturing Company, New York City; F. H. Miller, Louisville (Ky.) Railway; C. N. Pittenger, Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio; E. D. Priest, General Electric Company, Schenectady, N. Y.; C. F. W. Rys, Carnegie Steel Company, Pittsburgh, Pa.; F. W. Sargent, American Brake Shoe & Foundry Company, New York City; Charles F. Scott, General Electric Company, New York, N. Y.; Karl A. Simmon, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; C. W. Squier, ELECTRIC RAILWAY JOURNAL, New York City; J. M. Yount, United Railroads of San Francisco (Cal.); R. H. Dalgleish, Capital Traction Company, Washington, D. C.

Committee on Power Distribution—Charles R. Harte, The Connecticut Company, New Haven, Conn., chairman; Azel Ames, Kerite Insulated Wire & Cable Company, New York City; C. C. Beck, Ohio Brass Company, Mansfield, Ohio; Ralph W. Eaton, Public Service Engineer, Providence, R. I.; H. H. Febrey, American Steel & Wire Company, New York, N. Y.; C. J. Hixson, General Electric Company, Schenectady, N. Y.; Charles H. Jones, Metropolitan West Side Elevated Railway, Chicago, Ill.; F. McVittie, New York State Railways, Rochester, N. Y.; M. B. Rosevear, Public Service Railway, Newark, N. J.; W. Schaake, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; A. Schlesinger, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; F. J. White, The Okonite Company, Passaic, N. J.

Committee on Power Generation—A. B. Stitzer, Republic Engineers, Inc., New York, N. Y., chairman; L. D. Bale, Cleveland (Ohio) Railway; H. P. Bell, San Francisco-Oakland Terminal Railways, Oakland, Cal.; Walter E. Bryan, United Railways of St. Louis (Mo.); N. A. Carle, Public Service Electric Company, Newark, N. J.; F. C. Chambers, Des Moines (Iowa) City Railway; H. E. Davis, New York State Railways, Utica, N. Y.; C. A. Greenidge, J. G. White Management Corporation, New York, N. Y.; H. A. Kidder, Interborough Rapid Transit Company, New York, N. Y.; Charles F. Lloyd, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; G. W. Saathoff, Henry L. Doherty & Company, New York, N. Y.; E. H. Scofield, Minneapolis (Minn.) Street Railway; L. R. Shattuck, Sanderson & Porter, New York, N. Y.; E. P. Waller, General Electric Company, Schenectady, N. Y.

Committee on Way Matters—R. C. Cram, Brooklyn Rapid Transit Company, Brooklyn, N. Y., chairman; H. A. Abell, New York State Railways, Rochester, N. Y.; Charles A. Alden, Bethlehem Steel Company, Steelton, Pa.; Victor Angerer, William Wharton, Jr., & Company, Easton, Pa.; S. Clay Baker, East St. Louis & Suburban Railway, East St. Louis, Ill.; W. R. Dunham, Jr., The Connecticut Company, New Haven, Conn.; E. B. Entwisle, The Lorain Steel Company, Johnstown, Pa.; H. Fort Flowers, Differential Car Company, New York, N. Y.; Howard H. George, Public Service Railway, Newark, N. J.; W. F. Graves, Montreal (Que.) Tramways; E. M. T. Ryder, Third Avenue Railway, New York, N. Y.; T. B. Skelton, Metal & Thermit Corporation, New York, N. Y.

Equipment Committee Gets to Work

THE equipment committee of the Engineering Association held its first meeting of the year at association headquarters in New York City on Jan. 12. Those present were Daniel Durie, West Penn Railways, chairman; W. S. Adams, J. G. Brill Company; T. R. Langan, Westinghouse Electric & Manufacturing Company; F. H. Miller, Louisville Railway; C. N. Pittenger, Steubenville, East Liverpool & Beaver Valley Traction Company; C. F. W. Rys, Carnegie Steel Company; F. W. Sargent, American Brake Shoe & Foundry Company; C. F. Scott, General Electric Company; K. A. Simmon, Westinghouse Electric & Manufacturing Company, and C. W. Squier, ELECTRIC RAILWAY JOURNAL.

The twelve subjects given to this year's committee for consideration and report, printed in the issue of this paper for Dec. 25, 1920, were taken up and discussed. In order to minimize the number of sub-committees necessary for carrying on this work, several subjects were combined and assigned to one committee. In the list as previously given, subjects 2, 3, and 11; 4 and 10, and 7 and 8, respectively, were combined, thus reducing the number of sub-committees to eight. The work to be taken up is divided as follows, the name given first in each instance being that of the chairman of the sub-committee: (1) Brake shoes, heads and keys—Messrs. Sargent, Benedict, Holding and Pittenger; (2, 3 and 11) Tread and flange contour of wheels—Messrs. Dalgleish, Benedict, Durie, Holding, Rys and Sargent; (4 and 10) Specifications and standards—Messrs. Johnson, Dalgleish, Holding and Rys; (5) Helical gears—Messrs. Durie, Priest, Johnson and Simmon; (6) Car arrangement and design—Messrs. Benedict, Adams, Langan and Scott; (7 and 8) Life of wearing parts—Messrs. Pittenger, Langan, Priest, Scott, Simmon, Squier and Yount; (9) Direct-current lightning arresters—Messrs. Miller, Langan, Pittenger and Scott; (12) Layout of shop building—Messrs. Squier, Adams, Johnson, Miller, Priest, Simmon and Yount.

In connection with the study to be made of the life of wearing parts, the committee decided that this year's work should be confined to obtaining information on cast-iron and steel wheels, brake shoes, axle and armature bearings and trolley wheels. The next meeting of the committee will be held at association headquarters on March 16 and 17.

New Section at Camden

A COMPANY section of the American Association was formed at Camden, N. J., on Jan. 13, by employees of the Southern Division, Public Service Railway. Several representatives of the association from out of town were present and assisted in the launching of the new enterprise. While an active section has been maintained by Public Service for several years, it has been difficult for geographical reasons for the employees in the Southern Division to take an active part in the section activities. The inauguration of section work at this point is part of the program of Manager Martin Schreiber, outlined in his Atlantic City convention paper, for the development of a co-operative spirit in his organization.

Letters to the Editors

The Selling Idea in Zone Fares

MOUNT VERNON, N. Y., Jan. 10, 1921.

To the Editors:

Your publication of the article by L. S. Storrs on "Our National Fare Experiment" in the issue of Jan. 1 is a characteristic bit of enterprise in keeping a step or two ahead of the mass mind of the industry. The diagrams or maps must prove especially helpful in showing how far our pioneers have gone in these zone fare beginnings.

Somewhat loosely, I think, Mr. Storrs states that "It appears that there is no known method of assessing fares upon the riding public that has not been tried in this national experiment." Then he adds with delicious humor: "Some methods never heard of before have also been tried, as is evident."

However, it is far less important to list types of graduated and other special fares that have not been tried in the United States than it is to point out that the spirit in which such changes are made is far more important than the outer resemblance to fare schemes elsewhere. Our operators and regulators are still largely steeped in the unit-fare tradition which gave so little scope to the selling of transportation. In a real business, special inducements are always made to secure the patronage of those who can stay away, on the basis that overhead as well as operation enters into the cost of the article sold. In our industry—for it is not yet a business—those who can stay away are the walkers, the automobilists, the motor-truck riders and that more than half of the population not engaged in earning a living. When examined through this lens of traffic creation it is evident that few indeed of our roads have adjusted their fares in the true spirit of transportation salesmanship which underlies the graduated fare.

WALTER JACKSON.

Points of Difference Between American and German Railway Practices

BERLIN, GERMANY, Nov. 22, 1920.

To the Editors:

There are two main points in which American and German electric railway equipment practices seem to differ. To these I think attention might well be directed in the United States, with a view to possible saving in maintenance and operating costs.

The first is the use of bow collectors rather than trolley wheels. The former would be of particular value with one-man safety cars, as their use would eliminate traffic interruptions due to the trolley wheel leaving the wire.

The second point is the use of the electric brake in place of the air brake. The modern motor is rugged enough to be used as a generator without undue heating and it would appear to be useless to introduce compressed air as a further means of braking. Moreover, air-brake equipment is expensive in first-cost, in power consumption and in maintenance. The Berlin street railways are planning to abandon air-brake equipment entirely because investigation has shown that they would thus have saved in 1913 the equivalent of 1 per cent in dividends. If this is true with pre-war costs of labor and materials, the saving would be much more under present conditions.

The prevalent idea in this country is that the air brake was introduced ten or twelve years ago only because the electric motor was not sufficiently well developed, having no commutating poles and being less well insulated.

I realize, of course, that compressed air is well liked in America, not only for braking but also for the operation of other safety appliances. However, I think the electric brake merits at least reconsideration.

"ENGINEER."

More About Foreign Rail Sections

EDGAR ALLEN & COMPANY, LTD.

SHEFFIELD, ENGLAND, Dec. 31, 1920.

To the Editors:

I have read with interest the articles on rail sections in the Nov. 27 and Dec. 4 issues of the ELECTRIC RAILWAY JOURNAL. The decision of the French tramways to adopt a flat tread with cylindrical wheels is very important and one which would not have been reached without very careful consideration. At the instance of Monsieur Bacqueyrisse, engineer General Omnibus Company, Paris, numerous inquiries were sent out before the war to French and German tramway companies. It was upon the results of this investigation that the decision was arrived at.

At the meeting of the Tramways & Light Railways Association, in July, 1920, to which you evidently refer in your article, I brought up this question and there was a very interesting discussion. Several engineers favored the flat rail and cylindrical tread wheels, provided that the track was new, but they preferred continuing the existing track with a radius rail. The radius now in general use is 12 in.; the London County Council, however, prefers the 6-in. radius. The result is that many companies now have both types. The engineering standards committee is at present considering this question and also that of increasing the depth of the groove.

On the subject of compromise joints, the article by R. C. Cram in your issue of Nov. 27 is very interesting and the illustrations are excellent. The method of determining the "hand" shown in Fig. 18 is the same as that adopted here, and cast joints are chiefly used.

I note that the American Electric Railway Association has adopted the term "special trackwork," which is the same as the term used here except that in America you spell "trackwork" as one word, whereas here we separate it into two. I think that "trackwork" is an improvement over "track work."

FRED BLAND,
Tramway Department.

"Get that Guy's Number"

A RECENT striking poster issued by the Ontario Safety League, as electric railway bulletin No. 140, has the above caption. The story told in the bulletin is this: "The conductor was helping an old lady off a car. An automobile shot by. 'Get that guy's number,' shouted the conductor to the motorman. They got it and it was reported to the police department." "That is safety education," states the poster.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Carhouse Burned

Additional Facts About Fire that Destroyed De Baliviere Structure in St. Louis

For the second time in less than three years the De Baliviere carhouse of the United Railways, St. Louis, Mo., has been partly destroyed by fire. The conflagration, which started on the evening of Jan. 3, burned the southeast section of the sheds to the ground. Sixteen motor cars were destroyed and seven motor cars and four trailers were badly damaged. Ten other cars were scorched and had windows melted or broken. Many cars in use on the Oliver line were put out of service permanently or temporarily, but traffic officials of the company saw to it that schedules on the days following were not disarranged. In consequence the public has not been inconvenienced by the fire.

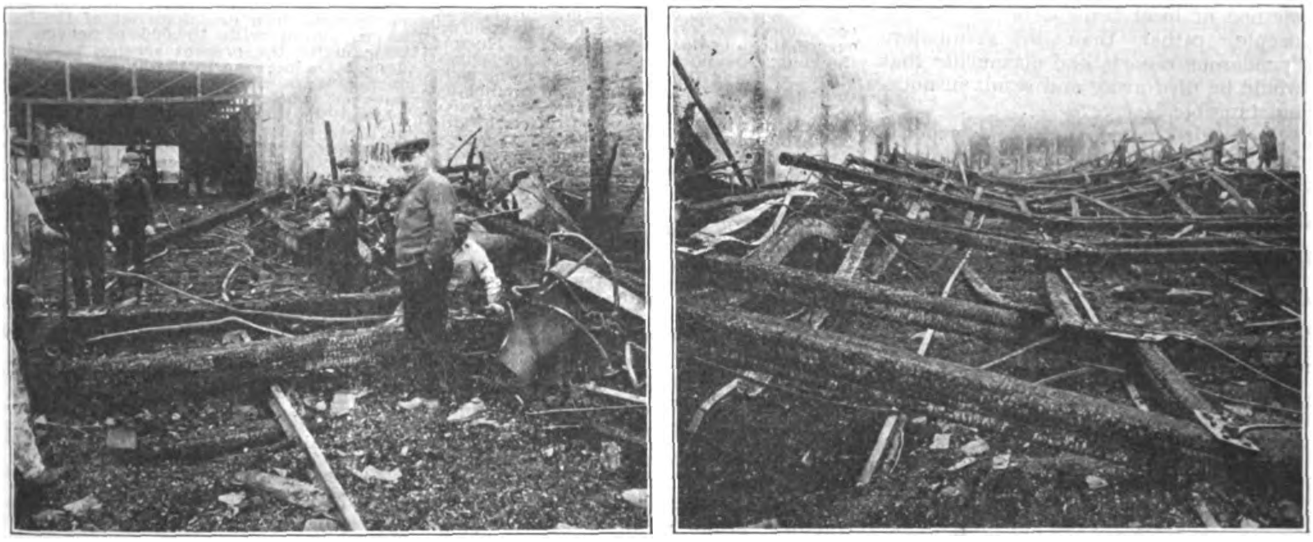
FORMER MISHAPS

The first fire at the sheds occurred on June 14, 1918, the eastern portion of the building being destroyed. Twenty-eight cars and a snow sweeper were lost in that fire. Another fire affecting the railway was the one at the plant of the carbuilders in October, when fifty cars in the course of construction for the United Railways were burned.

The De Baliviere carhouse extends from De Baliviere Avenue west to Laurel Street. Waiting rooms, offices and a power house are grouped about the sheds, but none of these was harmed. On the south the sheds are flanked by a number of apartment houses and these were thought to be in danger for a while, as the wind blew in that direction. The flames were, however, confined to the section of the sheds where the fire had started.

An investigation has been started by company officials to determine the origin of the fire. Car 365, near the center of the building and almost entirely consumed, had been put in the sheds only about five minutes before the fire was discovered. One theory advanced is that someone had dropped a lighted cigar or cigarette in the car or down a window slot.

Repair work on the building has been started and will be rushed to completion. Some alterations will be made at the same time. Cars which were damaged in the fire are being repaired and will be back in service in a very short time. The accompanying illustrations were made from photographs taken by F. C. Krug, official photographer of the railway company.



RUINS OF THE DE BALIVIERE CARHOUSE

Fight Expected Over Abolition of Commission

A fight is expected in the State of Arkansas over the public utilities commission. The incoming administration, which will be headed by Governor-elect McRea, was elected on a platform one of the planks of which called for the abolition of four state commissions, including the Public Service Commission. Such action, however, cannot be taken except by legislation. The matter came to a head a few days ago when Governor Brough was called on to appoint a member of the commission to fill a vacancy. He asked Governor-elect McRea to assist him, but the latter declined on the ground that the people by their vote had indorsed the commission abolition plank.

Wage Cut Rejected

Proposed Revision of Trainmen's Pay Downward at Detroit Will Go to Arbitration

The proposed wage cut of approximately 20 per cent which was suggested by the Detroit (Mich.) United Railway for all employees, effective Jan. 1, has been again rejected by the trainmen by an almost unanimous vote. The ballot was taken to determine the attitude of the men on the question, as it was contended by the Detroit United Railway that the men had not been properly informed as to conditions and that the men who attended the first meeting at which the subject was considered did not constitute a majority of the employees. At the first meeting a resolution was passed unanimously refusing the cut. At meetings held during the week ended Jan. 8 the employees voted 1663 to 4 against accepting the proposed cut.

It is believed that as soon as the company is officially notified of the decision of the union, steps will be taken leading to the appointing of a board of arbitration.

Since employees of some of the Interurban lines involved have not yet voted on the question, it is not anticipated that formal notification will be sent to the Detroit United Railway officials until after further meetings of the men have been held.

At the meeting of the Detroit employees, W. B. Fitzgerald, vice-president of the Amalgamated Association, criticised the company for its proposal to reduce wages at the present time, and urged the men to reject the proposal.

People's Ownership Plan Declared Feasible

Chicago Mayor's Traction Commission Reports for Five-Cent Fares—Proposed Transportation District Law Drafted

Mayor Thompson's long heralded plan for a restoration of a 5-cent fare in Chicago under a municipal-owned traction system was submitted to the City Council on Jan. 7 in the form of a report of his Commission on Local Transportation. With this was submitted a report by the commission's engineer, George W. Jackson, in which it was stated that he believed the Mayor's plan for a 5-cent fare was feasible "without adding any permanent burdens to the taxpayers of Chicago." There was also the draft of a proposed enabling act, which is to be sent to the State Legislature for passage, giving the voters of Chicago the power to establish the transportation district.

IN the early part of its report the commission points out that it has accumulated a mass of information, including maps of possible routes of subways, plans for structures and construction, data showing population and travel on lines of local transportation, etc., but it has acted on the theory that the commissioners were charged with the duty of working out a practical method of local transportation for the people, rather than to accumulate "ponderous reports and documents that would be filed away and result in nothing tangible."

It is also noted that it is not the function of the commission to formulate fixed plans and methods of local transportation, as it would appear unwise to select any one or any combination of plans, because it is desired to leave it to the trustees of the proposed Transportation District, to determine what is best at that time in the way of a proper traction system. Farther along in the report appears the statement that "we have omitted from our report the non-essential mass of detail, to the end that our conclusions and recommendations might not be obscured in the public mind through over-emphasis of some unimportant details by the opponents of people's ownership."

1907 TRACTION ORDINANCES QUOTED

In answering the question as to whether people's ownership is feasible and desirable, the commission points briefly to the provision of the 1907 ordinances wherein the city is authorized to purchase the traction lines, and to the Mueller law which purported to authorize the city to issue certificates on which to raise money to pay for the lines. The Supreme Court, however, held that such certificates constitute indebtedness of the city issuing them and that if the city of Chicago issued such certificates it would exceed the limit of its bonded indebtedness, and that, therefore, the city could not issue such certificates. The report then points out that this leaves the city without adequate means of raising sufficient money to purchase the lines and hence the provisions of the ordinances along this line are meaningless. It is furthermore pointed out that it is equally certain the city will never be able to find a licensee who will purchase the properties under the 1907 ordinances. The report states that according to the terms of the 1907 ordinance the companies can continue to operate their lines in the streets of the city until the city or its licensee pays to them the purchase price built up under the ordinances. This price, it is contended, includes from $85,000,000 to $90,000,000 of "water."

FIVE-CENT FARE ENTIRELY POSSIBLE

> So the city is helpless and the present companies can remain on the streets forever if these ordinances shall hold. Even if the courts should finally hold that the provision above is illegal, fraudulent and void the city would be in no position financially to acquire and operate a street railway system, because of the constitutional limitation of municipal indebtedness.
>
> So, unless the present companies are to be left in undisputed control, and permitted to continue their operations as they have in the past, it is obvious that the new Transportation District advocated by you (Mayor Thompson) is an absolute necessity.
>
> The question then recurs whether under this plan the people could be given 5-cent fares. Our investigation leads us to the conclusion that there is no doubt that it can be done.

Apparently to prove this statement the report shows that the "earnings of the Chicago Surface Lines under the 5-cent fare from Feb. 1, 1907, to Aug. 1, 1919," were $140,559,475, made up of the following items: 10 per cent of all items added to capital account for contractors' profit retained by the companies and not paid to any contractor but added to capital account; 5 per cent of all items added to capital account for brokerage but retained by the companies and not paid to any broker; 5 per cent of the capital account drawn out each year by the companies; 45 per cent of the net divisible receipts drawn out each year by the companies; 55 per cent of the net divisible receipts paid to the city; and the accumulation in the renewal fund over all expenditures for renewals. After presenting these figures the report draws no conclusions as to how the previous statement is substantiated that 5-cent fares can be had.

In concluding its direct statement the commission says:

> The plan proposed by your Honor, commonly known as the "Thompson Plan for People's Ownership and Operation of Street Cars at a 5c. Fare," if adopted, would obviate all the difficulties which have been heretofore experienced by the people of Chicago, and place it within their power to own and operate their lines of local transportation, if they so desire.

A communication from the engineering department of the commission is submitted as a part of this report. This is signed by George W. Jackson, engineer for the commission. In this Mayor Thompson is again assured that his plan is feasible and that under it the people can own and operate street cars in Chicago successfully at a permanent 5-cent fare. Mr. Jackson says:

> I am further able to say that such plan could be put into execution without adding any permanent burdens to the taxpayers of Chicago, and in my opinion the Transportation District contemplated in such plan would give the people of Chicago better local transportation than they have ever heretofore enjoyed.
>
> The present conditions in local transportation are mainly due to overcapitalization upon the part of the companies and their efforts to maintain unwarranted values on their properties and to make their lines earn dividends on inflated valuations by taking out of the pockets of the people the largest possible amount of money for the least possible amount of service.

The total report on the engineering work done for the commission is given in the following paragraph:

> The engineering features to be considered, of course, involve subway construction, at least to the initial extent of serving congested areas, with the possibilities of sufficient extensions to meet the needs of the future. Subway construction, however, is not vitally essential to the success of the Mayor's plan, but can be combined with it harmoniously and practically at any time. The re-routing of surface traction lines in the downtown business section under plans whereby 200,000 passengers an hour could be brought into or taken out of the loop, as compared with 100,000 passengers an hour under the present service, should be done. An increase in the average speed of surface cars accomplished through economies of routing and operation will bring perceptible relief, and the use of double-deck street cars and loading platforms for collecting fares, thus increasing capacity and eliminating the delay occasioned by payment of fares on the cars, will bring still greater relief.

DRAFT OF PROPOSED ENROLLING ACT

Mr. Jackson concludes his portion of the report with the following statements and explanation of how substantial savings in operating expenses may be made:

> The daily saving in expense referred to will total, conservatively estimated, $40,000 a day. This saving computed on the basis of 300 days yearly will equal an annual saving of $12,000,000. Included in this estimate are the following items:
>
> Elimination of the present Board of Supervising Engineers and the cost of service and rate investigations to the companies and the city by the Public Utilities Commission.
>
> Discontinuance of the employment of detectives and spotters through the sale of tickets to passengers before entering cars.
>
> Gain in revenue which will accrue through the sale of tickets instead of the payment of cash fares.
>
> Saving on payrolls of employees replacing switches and making repairs and renewals of trackage, which are now exorbitant.
>
> Saving in expense of operation by maintaining an average speed of 12 m.p.h. instead of 10 m.p.h., which is the present average.
>
> Saving by operating cars by the loop system in the downtown district and at a number of terminals.
>
> Saving of unnecessary overhead expense, costs of administration, lawyers' fees, legal expenses, and lobbying.
>
> Generation of their own power by people's lines, instead of purchase of same from private generators and distributors.
>
> Saving in purchases of equipment and supplies in open competition, instead of from concerns in which owners of traction capital are interested.

The printed report also contains the proposed enabling legislation which would create the Transportation District controlled by six trustees elected by the people of the district to provide a system of local transportation. The full control of such system would be vested in the board of trustees. The only restriction imposed is that in no case shall the rate of fare exceed 5 cents per person for a continuous trip in the same general direction wholly within the limits of any incorporated city within the Transportation District. This fare is not to be subject to the control of or review by any governmental agency of the State.

"Mayor Thompson's Traction Commission" was appointed on Sept. 9, 1919. The sum of $250,000 was appropriated for the expenses of its investigation. Of this amount $180,000 was spent. It was charged with two principal considerations; namely, is people's ownership and operation of the traction lines feasible, practicable and desirable; and will a permanent 5-cent fare be guaranteed thereunder?

The commission began its work by adopting a resolution wherein it was agreed that, inasmuch as the Illinois Public Utilities Commission was shown by its rulings in favor of the public utility corporations and against the interest of the people, it is vain to look for relief to that commission, and that, since the Supreme Court of Illinois had held that the State Public Utilities Commission had no jurisdiction over public utilities owned and operated by municipalities in the State of Illinois, arrangement should be made to appeal to the General Assembly for legislation authorizing the people to create a Transportation District or new municipal corporation, if they so elected, for the ownership and operation of the railway, at a 5-cent fare in accord with the so-called "Thompson plan."

Coup d'État by Municipal Line

Detroit United Official, About to Serve Injunction, Arrested and Marooned on Island Over Night

The Street Railway Commission of Detroit, Mich., succeeded on Sunday, Jan. 9, in crossing the Mack Avenue tracks of the Detroit United Railway at St. Jean Avenue with the Charlevoix-St. Jean line, the first municipal ownership route that it is proposed to start in operation, after E. J. Burdick, assistant general manager of the Detroit United Railway, had been taken to Belle Isle by Detroit policemen and detained there by the opening of the draw span in the bridge that connects the island with the mainland.

A TEMPORARY restraining order had been issued by Judge Harry Dingman to prevent the Street Railway Commission from crossing the tracks of the Detroit United Railway and it was while serving this order that Mr. Burdick was arrested by the police and hurried away from the scene in a patrol wagon.

About 200 policemen were in the vicinity of the crossing, having been assembled there at the order of Police Commissioner Inches. In a statement to John C. Lodge, acting Mayor at the time of forced crossing, Police Commissioner Inches said in explanation of the treatment accorded Mr. Burdick that Commissioner Martin of the Department of Public Works, Mr. Goodwin, manager of the Municipal Railway, and Ross Schram, secretary of the Street Railway Commission, all had informed him Saturday night that they were going to do some work at the corner of St. Jean and Mack Avenues, and asked protection as they feared trouble. Mr. Inches instructed Superintendent Rutledge to provide a force which would be able to take care of any trouble which might develop and it was decided to throw a cordon of officers around the men who were at work and thus prevent a crowd from gathering.

The number of men assigned to the job was increased when it became apparent soon after the work was started that the Detroit United Railway was massing some heavy equipment on its tracks and on the adjacent streets a short time before the work was begun. Not far from the contemplated work a heavy wrecking train of the Detroit United Railway was idle on that company's track and in the other direction a snow plow was stationed and motor trucks were awaiting on adjacent streets.

According to the statement by Mr. Inches, trouble began as soon as work was started. A large motor truck belonging to the railway was driven right through the gang of men who were starting the work and was abandoned at a point where it would entirely obstruct traffic on the street. Shortly after Mr. Burdick was observed among the men. The natural inference, according to the Police Commissioner, was that he was getting word to the wrecking trains and snow plow and other equipment to get into the fight, and he was removed from the scene of work and taken to the station for investigation.

According to Mr. Burdick the police attempted to prevent him from serving the temporary injunction. It is held, however, that service was made, inasmuch as it is only necessary that the one on whom the injunction is served be informed of the nature of the paper.

Ross Schram, secretary of the commission and also secretary to the Mayor, is credited with having supervised preparations for crossing the Mack Avenue line with the municipal rails. The Commissioner of Public Works, Mr. Inches and Mr. Goodwin are believed to have received their instructions from Mr. Schram.

As a result of the forced crossing, action was started in the Circuit Court, where the Detroit United Railway brought suit to force the city to abandon the crossing. The company also seeks permanently to enjoin the street railway commission for crossing its lines. Elliott G. Stevenson, attorney for the Detroit United Railway, asked that the city be compelled to restore the company's tracks.

Following the disposal of the first case, suit will be filed for E. J. Burdick for personal damages as a result of his alleged false arrest and his retention until morning by the police in an effort to prevent his serving the temporary injunction on city officials.

Voluntary Ten-Hour Day

Public Service Railway Employees Go on This Basis in Spirit of Mutual Helpfulness

A voluntary concession has been made by 4,000 trainmen employed by the Public Service Railway, Newark, N. J., to work ten hours a day for a six-month period instead of the nine hours now put in. This will bring about a rearrangement of runs. William Wepner, state chairman of the union, made the announcement on Jan. 13. He said that only about twenty out of a total membership of more than 4,000 men in the union voted against the proposition. Mr. Wepner said:

> The company has treated us better than we expected since our agreement made after the last strike. When we learned a month or so ago that a policy of retrenchment was to be adopted by the company we decided to do what we could to show our appreciation.
>
> The War Labor Board said a nine-hour day at the pay we were receiving for ten hours was fair. We have been paid at that rate since making an agreement with the company. It meant, though, that some of the men longest in the business would receive about $60 a week. I refer to about five per cent of our membership. This exceptional wage was a combination of the regular wage earned and overtime paid for several hours each day, which was not earned, in a sense, because the men were not compelled to remain at the carhouses.
>
> There are some of these men whose runs end at about 2 o'clock in the afternoon. The company needs them during the rush hour. Under the agreement, the company had to pay these men at a rate of time and a half for the three hours they loafed. They could be at their homes or anywhere, so long as they report to take out cars at 5 o'clock. This averaged $2.50 or more for each of about 500 men for almost every day in the year.
>
> We decided that, as the first step to help the company in its emergency, we would do away with this system. We planned a ten-hour day and a rearrangement of runs, so that these men would not have that loafing period. It was put before the union at fully attended meetings and agreed upon. I went into conference with President McCarter of the company and told him my plan. He assured me that he had intended no wage reduction for the men because of the financial difficulties he was facing and accepted the plan I offered. It will take about two weeks to put it into effect.

John L. O'Toole speaking for the company said:

> It is true that conferences have been held between the operating officers and representatives of the motormen and conductors looking to a readjustment of schedules that will be helpful in keeping down expenses. In fact, the relations between the company and its employees have been growing increasingly cordial for more than a year, and when the fact became evident that the company was not meeting its operating expenses the representatives of the men showed a commendable co-operative spirit and evinced a willingness to lend aid. As a result of many conferences the employees are accepting readjusted schedules of work which help to keep the costs from going higher.
>
> In some instances these schedules extend the day's run a little, but the contract hourly rate of pay is not altered. Some changes have already been made and, while it is not possible to measure results in dollars, even approximately, the real promise of value is the anticipated outcome of closer co-operation between employees and company in the operation of the cars and the supplying of better service.

Municipal Road May Start Service Feb. 1

According to Joseph S. Goodwin, general manager of the Detroit (Mich.) Municipal Railway, service will be instituted on the first of the municipal lines on Feb. 1. The first cars will be operated over the St. Jean lines to Charlevoix Avenue and thence east to Alter Road, a distance of about 4 miles.

Work is being carried on with a view to progressing as rapidly as possible with other municipal lines. With the advent of cold weather and the necessary slackening up of construction all equipment which has been procured for and used on the municipal lines is being overhauled and put in good condition in order that no delays will be experienced when the construction season again opens.

Chicago City Administration Attacked

In a call for the annual meeting on Feb. 8 of the Chicago City & Connecting Railways Collateral Trust, which holds the stock of the Chicago City Railway, an attack is made on the attitude of the Mayor of Chicago and the city administration toward the traction companies. The statement points out how seriously the activities of the company in providing additional facilities have been handicapped by the continual litigation with the city. In short, the city officials have continued to make political capital of the requirements of the traction companies despite the fact that this very attitude has made it virtually impossible for the companies to give adequate service.

Receivers Explain Accident

As a result of the fatal accident on a line of the Pittsburgh Railways, Pittsburgh, Pa., referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 8, the receivers of the company, Charles A. Fagan, W. D. George and S. L. Tone, at the conclusion of an all-day session of inquiry, issued the following statement:

> Investigations are being made regarding the accident which occurred last Monday evening during the rush hours, but it has not been possible to determine the direct cause of the same.
>
> For the purpose of impressing upon the employees of the railways company the necessity for following out rules of a similar nature previously made the receivers directed the posting of the following rule as to the operation of cars on the system:
>
> Motormen and conductors are hereby directed and ordered, that hereafter while operating cars in their charge, if brakes, or any portion of the equipment connected to the brakes do not operate properly they shall hold the car in its then position on the street until a following car can be coupled to it, and then proceed with such car to either the nearest car barn or to a switch where that car can be removed from the main track.

City Councilman John F. Dailey introduced a resolution compelling the railway to install safety chains on every car hauled by another car in which passengers are carried. Three separate investigations are now being conducted into the causes of the accidents.

News Notes

Cleveland Interest Fund Low.—The falling off of the number of car riders on the lines of the Cleveland (Ohio) Railway has been so great since the maximum rate of fare went into effect that the interest fund, which is the fare barometer, has continued to drop instead of showing the expected increase. On Dec 1 the interest fund had dropped to less than $60,000.

Wages of Way Men Reduced.—The New Jersey & Pennsylvania Traction Company, Trenton, N. J., has announced a reduction of 20 per cent in the wages of the employees of the maintenance of way department. Gaylord Thompson, general manager of the company, declares that the readjustment of the wage scale is in keeping with present conditions and that the new wages correspond with the scale recommended by the War Labor Board some time ago.

Wants Street Intersections Improved.—Commissioner Barbur has announced that unless street intersections traversed by the railway lines of the Portland Railway, Light & Power Company, Portland, Ore., are repaired immediately and put in proper condition he will appeal to the Public Service Commission for relief. The commissioner states that he has repeatedly urged executives of the railway to make repairs at street intersections but that nothing more than temporary repairs have been made.

Information Committee for Wisconsin.—The Wisconsin committee organized for the purpose of distributing information about the public utilities to the public has begun to function. This committee is conducted under the name of the Wisconsin Public Utilities Bureau, by the Wisconsin electrical, gas and telephone associations. Headquarters of the bureau are at 445 Milwaukee Street, Milwaukee, Wis. Frantz Herwig is director. Publication of a bi-weekly news bulletin for the use of newspapers has been started.

"All Together" at Camden. — The Public Service Railway at Camden, N. J., is issuing periodically under the direction of George A. Rothery a leaflet, entitled "All Together." By means of this pamphlet Mr. Schreiber, chief engineer of the Public Service Railway and manager of the Southern Division, is able to keep in close touch with his employees. In this paper such subjects as accidents, jitneys, etc., are discussed. In a recent number of Vol. 1 an urgent appeal is made to the men to try to co-operate with the company officials in securing the good will of the public. The paper states: "Please tell our patrons that the company welcomes any communication by word or by letter of any complaint, criticism or commendation about the railway and any such communication will be acknowledged and receive sincere, careful and intelligent consideration."

Programs of Meetings

Canadian Electric Railway Association

The members of the Canadian Electric Railway Association will meet at the Chateau Laurier, Ottawa, Ont., on Jan. 31 and Feb. 1.

C. E. R. A. Meeting Postponed

The annual meeting of the Central Electric Railway Association, which was announced for Jan. 27 and 28, has been postponed until Feb. 24 and 25.

National Civic Federation

Outstanding industrial problems, with which the American people are confronted today, from both the national and the international viewpoints, will be discussed at the twenty-first annual meeting of the National Civic Federation, to be held at Hotel Astor, New York City, Feb. 14, 15 and 16.

It will be the purpose at the Civic Federation's meeting to make so clear the difference between the sane, patriotic American labor movement and the labor movements of Europe that the so-called Liberal groups in the United States cannot longer becloud the situation.

The program for the federation's annual meeting will include, in addition to topics indicated by the problems presented in the foregoing, reports from its workmen's compensation department, social insurance department and the new department on study of revolutionary movements.

During the past year through fifteen sub-committees the last-named department made an extensive study of the extent to which the revolutionary forces in this country have penetrated the various groups making up our citizenry: Labor, agriculture, the church, the college, the public school, philanthropic agencies, negro and foreign groups, and women's organizations.

This investigation, says Ralph M. Easley, chairman of the executive council of the federation, has resulted in some amazing revelations which call for most serious consideration by those who believe that the institutions of our country should be safeguarded against the "boring from within" policies of the Socialists, I.W.W.'ites and bolshevists.

The sessions of the woman's department, to be held on the third day, will include consideration of the questions it has been studying during the past year, such as public health education, immigration and naturalization, the eductional system and its needs and the dangerous radical tendencies of the times as they affect American citizenship.

Financial and Corporate

Reading Property Evaluated

Cost of Reproducing and Developing the Property Included Based on Present Prices, Average Five-Year Prices and Historical

At the hearing of the Public Service Commission of Pennsylvania held on Jan. 5, 1921, in Harrisburg, A. L. Drum & Company, consulting engineers of Chicago and Philadelphia, presented on behalf of the Reading Transit & Light Company, a final report on the cost of reproducing and developing the electric railway properties of the Reading company. In accordance with the public service law of Pennsylvania the engineer's report comprises: (a) An estimate of the present-day cost of reproducing and developing the property. (b) An estimate of the cost at various fair average prices of reproducing and developing the property. (c) A statement of the historical cost including the developmental cost of the property.

A COMPARISON of the costs of reproducing the property on the several bases is contained in the accompanying table, which shows that the cost of reproduction on the basis of 1919 prices is 53.77 per cent in excess of the cost of reproduction based on average prices for the five years ending Dec. 31, 1917. The historical cost of the company's property is found to have been $6,150,687. This corresponds very closely with the cost to reproduce the physical property new on average pre-war prices.

The developmental costs as shown on the accompanying table are reported as specified in the Pennsylvania law and represent a measure of the developmental and going concern value of the property and indicate the costs that have been or would be encountered in creating and developing the property to its present state of efficiency and unification. The developmental costs are segregated under two heads, one consisting of the cost of unifying the system, representing an estimate of the cost incident to the creation and consolidation of the various companies now comprising the Reading Transit & Light Company into one operating company with the resulting benefits accruing to the public through the efficiencies and economies of operation and the reduction in fare due to free transfers established by reason of the unification of the system.

UNIFIED SYSTEM CONSISTS OF THIRTEEN COMPANIES

The unified system of the Reading Transit & Light Company, Reading Division, consists of some thirteen companies, six of which were merged into the Reading Transit & Light Company on Sept. 12, 1917, six are operated under lease and one is operated through stock ownership. During the historical development of the company twenty-six companies were chartered, with a final reduction to thirteen companies through mergers and sales. The other developmental cost consists of the loss of interest during operation and represents the deficit of return on the investment during the early period of operation up to the time the business had become established on a paying basis.

Physical property:	Basis No. 1 Average Prices 1913 to 1917, Inclusive	Basis No. 2 Average Prices 1914 to 1919, Inclusive	Basis No. 3 Average Prices 1919
Cost to reproduce new	$6,440,112	$7,642 424	$9.903,165
Developmental cost:			
Cost to unify system	487,000	487,000	487,000
Loss of interest during operation	450,808	534,970	693,221
Total developmental cost	$937,808	$1 021,970	$1,180,221
Total cost of reproducing and developing the property	$7,377,920	$8 664,394	$11,083,386

A summary of the cost of reproducing and developing the property under the various methods is as above.

The accrued depreciation as reported in the appraisal represents the amount of existing depreciation due to wear and use, as ascertained and determined by inspection and measurement in the field and is not based on theoretical depreciation due to age or obsolescence. The amount of accrued depreciation ascertained under the basis where average prices 1913 to 1917 were applied amounted to $709,983; on the basis of average prices 1914 to 1919 it amounted to $884,476; and on the basis of average prices during 1919 it amounted to $1,197,737.

READING DIVISION OPERATES RAILWAY

The Reading Division of the Reading Transit & Light Company owns or leases and operates the railway system in the city of Reading with suburban lines radiating from Reading through intermediate boroughs and to the villages of Womelsdorf, Adamstown, Birdsboro, Temple, Boyertown and Stony Creek. The property principally consists of 101.97 miles of track (gage 5 ft. 2½ in.), of which 36.48 miles are located in Reading and the remaining 65.49 miles in the Suburban Division; 141 passenger cars, thirty service cars; two main carhouses and shops; two office buildings, used jointly by the railway and the Metropolitan Edison Company, and miscellaneous buildings, waiting-stations, bridges, land, etc. Power is purchased from the Metropolitan Edison Company at Reading.

The appraisal was prepared from an inventory made by the railway company as of Dec. 31, 1917, and the reproduction cost as reported is arrived at by applying to the inventory units the actual existing prices for labor and material which prevailed in the community during the periods specified under the three different bases and represent the amounts it would actually cost the company to install the work in place. To the amounts as reported in the inventory and appraisal should be added the capital expenditures from Jan. 1, 1918, to Oct. 31, 1920, amounting to $158,823 to arrive at the reproduction cost as of October 31, 1920.

READING TRANSIT & LIGHT COMPANY

READING DIVISION

Estimated Cost to Reproduce New as of December 31, 1917, Based on Average Unit Prices Prevailing During the Periods Specified

	Basis No. 1 Applying Average Prices, 1913-1917 Inclusive	Basis No. 2 Applying Average Prices 1914-1919 Inclusive	Basis No. 3 Applying Average Prices 1919	Per Cent Increase 1914-1919 Over 1913-1917	Per Cent Increase 1919 Over 1913-1917
Track	$2,035,646	$2,581,478	$3,491,418	26 81	71.51
Bridges	183,750	225,388	295,322	22 63	60.72
Paving	540,587	664,329	1,010,144	22.89	86.86
Electrical distribution system	444,596	499,008	537,494	12 24	20 89
Rolling stock	869,346	1,075,147	1,396,013	23 67	60 58
Shop machinery, shop tools and supplies	26,299	27,966	38,608	6 34	46.78
Buildings	268,339	317,388	458,092	18 28	70 71
Furniture and fixtures	6,883	8.259	12,388	20 00	80 00
Stores, tools and miscellaneous equipment	106,331	107,916	118,028	1.49	11.00
Land	602,039	602,039	602,039	.....	......
Expenditures not apparent in inventory	14,859	14,859	14,859	.....	......
Engineering and superintendence	218,313	264,394	347,604	21.11	59.22
Administration, organ and legal expenses	258,872	258,871	258,871	.....	......
Taxes during construction period	23.858	22 822	20,825	*4 34	*21 71
Interest during construction	391,980	466 891	688,137	19.11	75.55
Working capital	141,742	141 742	141 742	.....	......
Cost of financing	306,672	363,924	471,579	18 67	53.77
Physical property, total value	$6,440,112	$7,642,423	$9,903,164	18.67	53.77

* Decrease.

Interborough's Deficit Still Decreasing

The Interborough Rapid Transit Company has been steadily decreasing the deficit in its net income from August, 1920. That month the Interborough showed a deficit of $658,000, and in its latest report for November the figure is down to $261,000, against a $155,227 deficit for November, 1919. In its five months' statement ended Nov. 30, after subtracting interest, rentals, etc., the company lost $2,381,357 against $1,898,196 for the corresponding period of last year. In November, 1920, the Interborough carried 86,466,512 revenue passengers, an increase of 8,028,271 over 1919.

INCOME STATEMENT OF THE INTERBOROUGH RAPID TRANSIT COMPANY

Month Ended Nov. 30:	1920	1919	Percentage Change Over 1919
Gross operating revenue	$4,813,587	$4,286,850	12.3
Operating expenses	3,124,459	2,619,757	19.3
Net operating revenue	$1,689,128	$1,667,093	1.3
Total taxes	217,218	211,949	2.5
Income from operation	$1,471,910	$1,455,144	1.2
Non-operating income	52,230	42,864	21.9
Gross income	$1,524,140	$1,498,008	1.7
Interest rentals, etc., including Manhattan Guarantee	1,785,570	1,653,235	8.0
Net Corporate Income (exclusive of accruals under the provisions of Contract No. 3 and related Certificates which under these agreements with the City are payable from future earnings)	*$261,430	*$155,227	—68.5

* Deficit

Five months ended Nov. 30:	1920	1919	Percentage Change Over 1919
Gross operating revenue	$21,989,323	$19,531,958	12.6
Operating expenses	14,798,444	12,319,269	20.0
Net operating revenue	$7,190,879	$7,212,689	— 0.3
Total taxes	1,090,437	1,068,960	2.0
Income from operation	$6,100,442	$6,143,729	— 0.7
Non-operating income	260,159	217,941	19.4
Gross income	$6,360,601	$6,361,670	— 0.02
Interest, rentals, etc., including Manhattan Guarantee	8,741,958	8,259,866	5.8
Net Corporate Income (exclusive of accruals under the provisions of Contract No. 3 and related Certificates which under these agreements with the City are payable from future earnings)	*$2,381,357	*$1,898,196	—25.5

* Deficit.

Improvement in American Cities Company's Affairs

The committee headed by J. K. Newman representing the deposited 5-6 per cent collateral trust bonds of the American Cities Company reports favorable progress in the development of the subsidiary properties of the American Cities Company. As soon as operating figures for 1920 have been completed a report will be made covering the operation and financial position of each of the subsidiary properties.

Recent statements of earnings of the subsidiary companies indicate that those companies are on a basis where their combined net earnings are more than sufficient to pay interest on the American Cities Company 5-6 per cent collateral trust bonds after setting aside ample renewal and replacement funds in addition to adequate maintenance expenditures. However, the subsidiary companies have declared no dividends, as the surplus earnings have been used to better the physical properties.

While a complete reorganization plan has been prepared, the committee considers it inadvisable to submit it under the present financial conditions. The committee in consequence recommends that the deposit agrement of Jan. 15, 1919, be amended so that the time for the submission of a plan thereunder be extended to Dec. 31, 1921, and that the deposit agreement as so amended be extended and renewed.

Interborough Meets Interest Payment

Arrangements completed on Dec. 30 give the Interborough Rapid Transit Company, New York, N. Y., a six months' extension on its 7 per cent notes, which fell due on Jan. 1. The company planned to pay the interest due the first of the year on the 5 per cent bonds amounting to $3,800,000 with cash accumulated through operation of its lines.

The following statement was issued by Frank Hedley, president and general manager of the Interborough:

> My attention has been called to a statement on the news ticker that the Interborough Rapid Transit Company will be saved from receivership on Jan. 1, 1921.
>
> The Interborough Company has been successful in securing an extension of its notes of $2,900,000 for six months, and as a result of this, and by adopting the policy of paying some of its obligations as it may be possessed with cash after Jan. 1, the company will be able from the cash on hand and which it expects shortly to receive, to meet its obligations, but the company has not been able to negotiate any loan for new cash.

Brooklyn City Officers Re-elected

At the annual meeting of the stockholders of the Brooklyn (N. Y.) City Railroad the following directors were elected: Frederick L. Allen, William N. Dykman, Richard L. Edwards, Crowell Hadden, Alfred R. Horr, Frank Lyman, Edwin P. Maynard, Henry F. Noyes, H. Hobart Porter, Dick S. Ramsay, Hiram R. Steele, James Timpson and Harold T. White.

Frank Lyman, the president of the company, presided at the meeting. H. Hobart Porter, vice-president and general manager, in response to questions by stockholders, stated that the gross earnings of the road now aggregated about $200,000 weekly. Mr. Porter told of the difficulties encountered by the management since the Brooklyn lines resumed independent operation on Oct. 19, 1919, stressing particularly the expense incurred through the recent strike and the heavy snow fall of last year. Necessary improvements in equipment and other operating detail he mentioned as additional large sources of expenditure.

Mr. Porter reiterated to the stockholders the statement addressed to them in his recent letter, emphasizing the necessity of a higher fare if the road were to gain a sound financial position.

Mr. Lyman was re-elected president of the Brooklyn City Railroad at the meeting of the directors on Jan. 11 and Mr. Porter was re-elected vice-president and general manager. Mr. Porter has had charge of the Brooklyn City system since independent operation was resumed. Mr. Lyman has been president of the company since 1911. Henry F. Noyes was elected vice-president; S. B. Olney, secretary; and George W. Jones, treasurer. Other officials chosen were: Clinton E. Morgan, assistant general manager; E. H. Reed, auditor; L. E. Sharpe, assistant secretary and treasurer; William Siebert, superintendent of transportation; and James T. Grady, publicity director. Mr. Morgan has been identified with the Brooklyn City Railroad since the lines were taken over by their owners.

Equipment Trust Certificates Offered

In its January circular the bond department of the Chicago Trust Company describes the equipment trust 8 per cent gold certificates of the J. G. Brill Company, issued for subscription at 100 and accrued interest. The certificates mature serially. They are in coupon form in denominations of $1,000 and $500. These certificates are issued by the Chicago Trust Company, trustee, under the "Philadelphia Plan," and are secured by Birney one-man safety cars, built by the J. G. Brill Company, and equipped by the General Electric Company and the Westinghouse Airbrake Company. Purchase contracts and notes covering the sale of the equipment are pledged as additional security with the trustee, and title remains in the trustee until all outstanding certificates have been retired. The cars securing these certificates are operated by well-known, successful companies, including the Iowa Railway & Light Company, the Houston Electric Company, the Puget Sound Power & Light Company, the Tampa Electric Company and others. The certificates represent approximately 63 per cent of the purchase price of the cars, the balance having been paid in cash and junior securities.

Valuation Has Small Effect on Rate of Fare

A recent issue of the *N. O. T. & L. News*, which is distributed to the patrons of the railway lines of the Northern Ohio Traction & Light Company in Akron, Ohio, brings out an interesting point as to the effect of the valuation figures on the rate of fare. The new service-at-cost franchise being negotiated at Akron contains a provision that the property shall be valued by a commission after the franchise is put in effect. As usual, some opponents to the plan are making much capital of the fact that the property has not been valued, and that this will have a very material effect upon the rate of fare should a high valuation be placed after the contract is entered into. The comment follows:

> Suppose the Akron city system was valued at $5,000,000, the interest charge (7 per cent) would be $350,000 annually.
>
> Suppose the balance of the expense was $2,650,000 annually.
>
> Suppose the company carries 60,000,000 passengers annually, as it probably will within the next year.
>
> The fare would be just 5 cents.
>
> Now suppose the system was valued at $6,000,000, what difference would it make in the fare?
>
> A little more than one mill.
>
> If the system were valued at $7,000,000 the difference would make a little more than 2 mills; if $8,000,000, a little more than 3 mills, and so on.
>
> It would require an increase of more than $4,000,000 to make a difference of 1 cent in the fare.
>
> Why talk about the valuation regulating the fare?
>
> It's the price of labor, cost of upkeep of track and expense for equipment, coal, etc., that regulate fares.

Statistics of Express Companies

Statistics of the mileage covered by the national express companies in the United States have just been published by the Interstate Commerce Commission. They follow:

	1919	1918
Kind of mileage:		
Steam road	238,354.22	239,282.12
Electric line	3,523.75	6,951.25
Steamboat line	31,060.87	40,410.12
Stage line	906.42	1,175.42
Total mileage	273,845.26	287,818.91

The figures during 1919 are those of the American Railway Express Company and in 1918 of that company and some smaller companies absorbed by it during 1918.

Prospects Good for Financial Rehabilitation

J. R. Baggett, of Lillington, N. C., who was recently appointed by the North Carolina courts as a temporary receiver of the Cumberland Railway & Power Company, which owns and operates a number of public utilities in the State of North Carolina, is reported to have stated that in examining in Norfolk the inventories, books, etc., he regards the physical properties of the company to be worth approximately $500,000. This, he states, is based on a very thorough appraisal made by the Appraisal Company of the South as of March 15, 1920, and upon his inspection and examination of the company's properties.

He further states that there are somewhat less than $500,000 of bonds apparently outstanding. His information is that the Corporation Commission of North Carolina values the properties of the company for tax purposes at more than $400,000. Mr. Baggett is said to feel that giving publicity to unfounded rumors and to information manifestly unreliable would tend to prejudice very seriously the rights of the company's security holders.

He is quoted by the *Virginian-Pilot* of Norfolk as follows:

> Mr. Baggett is of the opinion that if his plans in regard to the company's management can be carried out the security holders of the company will be amply protected and that no loss will be sustained by either the bondholders or the creditors. Mr. Baggett assigns the reason for the company's embarrassment and the receivership petition more to the financial stringency which prevented the obtaining of ready funds for development than to an insolvent condition. He says that he has the unqualified co-operation of the officers and directors of the company, with a view to putting the company on its feet and feels that if the bondholders and others interested will show the proper spirit of co-operation the company will ultimately prove a very profitable venture.

Financial News Notes

Abandonment at White Plains Approved.—The Public Service Commission for the Second District of New York has approved abandonment by the Westchester Street Railroad of its Westchester Avenue line in White Plains but has declined to approve a declaration of abandonment by the company of its Mamaroneck line.

Short Stretch Is Abandoned. — The Southeastern Ohio Railway, Zanesville, Ohio, was authorized by the Public Service Commission to abandon its Mill Run line on Dec. 31. The line extends for 1 mile from North Sixth Street, out Sixth, on Howard, North Seventh, Price, Fernanda and Hall Avenues to the Mill Run depot of the Ohio River & Western Railroad.

Maumee Lines Operate Leased Equipment. — The Maumee Valley Lines, being operated by Raleigh D. Mills, receiver, are using cars rented from the Toledo Railways & Light Company at $5 a day each. What the railroad will do when the cost-of-service franchise goes into effect and the cars are turned over to the Community Traction Company is problematical.

Abandonment Application Withdrawn. —The Public Service Commission for the Second District of New York has authorized the Geneva, Seneca Falls & Auburn Railroad to withdraw its application for authority to cease operating that part of its line between Garden Street in Seneca Falls and Cayuga Lake Park. This action follows a hearing before Commissioner J. A. Barhite, who recommended a closing of the company's application to cease operations.

Restoration Suit to Equity Court.—Judge Thomas H. Darby, of the Common Pleas Court of Hamilton County, Ohio, has refused to appoint a Master Commissioner to hear the suit for $350,000 and accounting filed by the city of Cincinnati against the Cincinnati Traction Company. In his official capacity as Presiding Judge of Common Pleas Court, Judge Darby said he would send the case for trial to one of the equity courtrooms as soon as the parties of the suit are ready for trial.

Greenville Road Purchased.—In the matter of the purchase of the railway system at Greenville, Tex., by the city, referred to in the ELECTRIC RAILWAY JOURNAL on Jan. 1, 1921, the property included was that of the Greenville Railway & Light Company, which connects Greenville and Peniel. There were originally two systems in Greenville; namely, the Greenville Railway & Light Company and the Mineral Heights Street Railway. The latter company abandoned service some time ago, although the tracks of the railway still remain in the streets.

Dividend Reduced.—The directors of the American Light & Traction Company, New York, N. Y., have declared a quarterly dividend on its common stock of 1 per cent in cash and 1 per cent in stock. In the preceding quarter 1 per cent in cash was distributed in addition to 1¾ per cent in stock. From 1910 to July, 1920, the company has maintained an annual rate of 10 per cent cash and 10 per cent stock. In July, however, a quarterly dividend of 1¾ per cent cash and a like amount in stock was declared. Three months later the cash payment was made 1 per cent. The regular dividend of 1½ per cent on its preferred was declared, all dividends being payable on Feb. 1 to stock of record on Jan. 14.

Thrift Campaign in Blue Grass District.—The Lexington (Ky.) Utilities Company is conducting a bond-selling campaign in the interests of Kentucky utilities. The offering consists of first lien and refunding 6 per cent gold bonds in $50, $100, $500 and $1,000 denominations to yield more than 7 per cent. Bonds may be purchased for cash or on a time plan. In an effort to interest the people of Lexington and its surrounding vicinity in home industries instructive and attractive circulars have been issued by the company. These circulars contain pictures of electric shops and power houses and depict what the lighting company in the Blue Grass district has done and is doing in the way of service. "Invest in home industries and help make your community a bigger and better one" is the direct appeal of the Lexington Utilities Company to the residents of Lexington and vicinity.

Traffic and Transportation

Service Order for Chicago

Illinois Commission Orders Safety Cars, Trailers, Loop Rerouting and Skip Stop Continuance

The Public Utilities Commission of the State of Illinois on Jan. 3 issued an order to the Chicago Surface Lines to continue skip-stop operation, to install safety cars on certain lines, to proceed to use trailers and to work on a rerouting plan for the down-town loop district. This new service order was issued after a series of hearings, looking toward improvement in the service rendered by the surface railways.

The skip-stop plan ordered is that which is now in force and which was installed by City Council ordinance during the war, as a coal conservation step. There has been a good deal of agitation that the skip-stop should be abolished, but the commission points out that this plan has resulted in greater efficiency and decreased running time, enabling the railways to carry more passengers with the equipment available. In view of this saving in operating expenses and better service to the public, the commission orders that the companies continue to carry out the skip-stop plan of operation now in effect until further notice from the commission.

ONE-MAN CARS APPROVED

With regard to one-man safety cars, the commission states that the railways are authorized and ordered to procure and install these cars at the earliest date possible, on such lines and at such times as the traffic is light and their use would make possible a more frequent or better service, or would release heavier equipment for use on other lines. The commission's order places a definite limitation on where such cars may be used by stating that they shall be operated in day service only on those lines outside the loop where the headway between cars during morning rush hours is not less than 7 minutes; and in night service on those lines where the headway between cars is not less than 15 minutes.

In its order on the operation of trailers, the commission referred back to a service order dated Sept. 29, 1915, in which it pointed out that the use of trailers would increase the capacity of the tracks and that their use is practicable and feasible, but stated that there was doubt whether the use of trailers was justified at any other time than during the rush-hour period. In the new order the commission rescinds this earlier finding and orders the use of trailers on such lines and at such times (all day or in rush hour only) as the density of traffic is great and the use of trailers would result in greater accommodation and better service.

The commission further orders the companies to prepare and submit to it within sixty days preliminary plans for such rerouting and switchback and turnback service as the company may deem practicable and effective in facilitating the movement of cars and reducing the congestion of traffic in the loop.

It will be recalled that the Chicago Surface Lines has already purchased and received ten standard one-man safety cars which to date have not been placed in operation. It also has under construction in its West Side Shops, fifty trailer cars. There has been some opposition on the part of trainmen to operating safety cars.

Eight Cents in East St. Louis

The Public Utilities Commission of Illinois, after more than two years' deliberation on the application of the East St. Louis (Ill.) Railway, a part of the East St. Louis & Suburban Railway, for permission to charge increased fares, has made a ruling as one of its final acts granting the company's request.

The ruling is that the permanent fares on cars in East St. Louis shall be 8 cents for an adult single fare, two adult tickets for 15 cents, and 3 cents for children, cash or ticket fare. The present fare is 8 cents for adults and 4 cents for children. The new order is effective at once.

The award was made on an application filed in 1918 for increased rates. At the time the appeal was made fares were 5 cents for adults and 2½ cents for children. The company asked for a 6-cent rate for adults and 3 cents for children. A temporary order to that effect was made and the City Council adopted a resolution giving approval of the increase. While the temporary rates were in effect the commission started an investigation to ascertain the value of the company's property as a basis to figure the rate of income the company should receive in order to meet its obligations.

While the commission was engaged in conducting hearings and using experts to determine the valuation of the property the company filed two amendments to its petition, one for a 7-cent fare and the other for an 8-cent fare. No action was taken on the 7-cent fare application, but the commission granted permission to the company to charge 8 cents for adults and 4 cents for children as a temporary measure. This order was issued about six months ago to permit the company to take care of an increase in wages.

When the 6-cent fare was granted an appraiser appointed by the commission fixed the company's valuation at $1,560,000. The company contended the valuation was too low.

Ticket Rate Advanced

Railway at Santa Cruz Authorized to Sell Six Rides for Fifty Cents —Cash Fare 10 Cents

The Union Traction Company has been authorized to increase its fares in Santa Cruz, Cal., and vicinity by the sale of six rides for 50 cents instead of eight. The Railroad Commission in an order issued on Jan. 4 says, in reference to the fact that the company has not asked for a rate sufficient to yield a return on its investment:

> We have given careful consideration to the return secured in the past and to the extent to which the earnings may be increased as a result of the increased fares sought, and while the moderate advance to be made in the fares may solve the problem and retain to the community the transportation service which it needs in order to continue to grow and prosper, it is difficult to escape the conclusion, in the face of the competition by automobiles, mostly vehicles operated for private family use, that the limited number of riders now patronizing a street car system of this kind cannot be expected to pay rates sufficiently high to carry the entire burden.

YEAR'S DEFICIT $35,846

In 1920 the actual loss of the company, as brought out at the hearing of the application to increase rates, totaled $35,846. The commission says that the company is efficiently and honestly managed and that operating expenses have been reduced to a minimum by the use of one-man cars wherever possible. "Further reductions in operating expenses," says the commission, "appear impossible without seriously impairing the standard of the service now being rendered."

The commission points out that prices of materials and labor have greatly advanced during recent years and cites the fact that platform men who, in 1917, were receiving 26, 27, 28 cents an hour, depending upon the length of service, are now receiving 46, 48 and 50 cents an hour. The commission also points out that while the company's gross revenue increased $22,530 from 1916 to 1920 the expenses, in the same period increased $27,066.

The following is also from the commission's opinion:

> At the hearing some objections were entered by certain citizens against the increases in fares, another group of patrons had no objections to urge, the majority frankly declaring that it would be a calamity to the city of Santa Cruz and the outlying districts if the company were forced to discontinue or curtail its service by reason of lack of adequate revenue. The City Attorney, while calling attention to some unsatisfactory service at points along the line, had no objection to the increase in fares and stated that in his judgment the application should be granted.

The commission's order allows the company to continue charging 10 cents for single fares.

New Mexico Road Wants More

The Las Vegas (N. M.) Transit Company has filed an application with the State Corporation Commission for permission to increase its fares from 6 to 8 cents. The company explains that the cost of operating is far in excess of receipts and that its patronage has seriously decreased during the past few months.

Fares Up in Florida

Jacksonville and Pensacola Companies Awarded Advances After Court Insists Commission Shall Act

Awards have been made of a 7-cent fare for the Jacksonville (Fla.) Traction Company and an 8-cent cash fare with 7½-cent tickets for the Pensacola (Fla.) Electric Company. The two companies appealed for 10-cent fares. The rates allowed will not suffice, in the opinion of Peter O. Knight, general counsel for the Stone & Webster subsidiaries in Florida, who argued the case before the Railroad Commission and then before the State Supreme Court, where he won a decision to the effect that a street railway is a railroad. The Railroad Commission assumed jurisdiction after it was ordered by the Supreme Court to hear the appeals.

COMMISSION ASSUMES JURISDICTION

After assuming jurisdiction, the commission, handling both cases jointly, held hearings in Jacksonville and Pensacola, had its experts audit the books of both companies for years back and ordered an appraisal of the companies' properties.

Though the counsel for the Stone & Webster corporation argued that a 10-cent fare would yield only 5 per cent on the commission's own valuation of the properties on the Jacksonville lines and only 3 per cent on the Pensacola property, the orders were prepared with the 7-cent basis in Jacksonville and the 8-cent basis in Pensacola.

In addition the companies in both cities were directed to issue tickets for school children at the rate of ten for 40 cents, to continue to provide transfers and to file special charter rates for review.

The financial difficulties of the Jacksonville corporation go back of November, 1919, when a receiver was appointed by Federal Judge R. M. Call in the District Court. Receivership for the Pensacola company followed in February of 1920. E. J. Triay was appointed in Jacksonville and J. J. Holdzclaw in Pensacola.

COAL PRICE BIG FACTOR

The rapidly increasing price of coal, several increases in wages, arbitrary rulings in Jacksonville that extensions be made, when such were costly and unprofitable, and general conditions in Pensacola, contributed to make conditions worse and worse. The Jacksonville company paid as high as $17 per ton for coal, according to Mr. Knight, and at Pensacola prices ranged almost as high. Old prices had been $3.50.

Conditions were very bad when the first application was made to the Railroad Commission. The commission ruled that it had no jurisdiction over street railways. It held that such roads were public utilities, but not railroads.

Mr. Knight, petitioning for the receivers, asked the Supreme Court for a writ of mandamus directing the Railroad Commission to assume jurisdiction and grant reasonable and just rates. Jacksonville and Pensacola attorneys opposed the action. The State Attorney General and the commission's attorney led the fight against the writ, but Mr. Knight and J. L. Doggett succeeded in securing a ruling that "a street railway is a railway or railroad."

When the commission assumed jurisdiction it disposed of the appeal by granting a part of what was asked.

Valuation Case Argued

Presentation of evidence and examination of witnesses in the case of the city of Knoxville, Tenn., vs. the Knoxville Railway & Light Company, in which the traction concern is seeking a 7-cent fare, was completed before the Public Utilities Commission of Tennessee at Nashville on Jan. 7. The hearing had been in progress four days.

Counsel for the city was given until Jan. 18 in which to file protests. A decision is not expected until a thorough examination is made of the briefs on the part of the commission.

The point at issue before the commission is the value of the traction company's property along with its commercial lighting department. The appraisers for the company and the State made a joint report to the commission. The appraiser for the city of Knoxville refused, however, to sign this report. He made a separate finding in which he placed the value of the company's holdings at a figure about $2,000,000 less than that made by the engineers representing the State and the city.

The report of the engineers with respect to the valuation findings at Knoxville was reviewed in the ELECTRIC RAILWAY JOURNAL for Dec. 25, page 1302. The historical cost was reported as $6,234,141.

More Two-Fare Lines

New rate schedules have been filed with the Public Service Commission for the First District by the Brooklyn City Railroad and by several susidiaries of the Brooklyn Rapid Transit Company increasing the fare for long rides on fourteen Brooklyn surface lines. It is proposed to charge a 10-cent fare by restricting the single-fare zone and, in some cases, by eliminating free transfers.

Filing of the schedules is based on the decision of the Appellate Division of the State Supreme Court that the Flatbush Avenue line has the right to charge a double fare. The decision followed the disorder which attended the effort of the Brooklyn City Company to charge two fares for a through trip. The Public Service Commission restrained the company from making the double charge and the company, appealing to the courts, won the fight. Since then two fares have been charged on this line and the Brooklyn City Railroad and the B. R. T. The commission has suspended the new schedules until March 12, pending an inquiry into the situation.

Railway Must Pay Overtime of Customs Agent at Port of Entry

United States District Judge R. Hazel at Buffalo, N. Y., has denied the application of the International Railway for a permanent injunction restraining the federal collector of customs at Buffalo from closing the International Railway's upper steel arch bridge and the Lewiston bridge at Niagara Falls on Sundays. The bridge crosses the lower gorge of the Niagara River and connects the Dominion of Canada with the United States. The collector of customs notified the railway he would close both bridges to Sunday traffic unless the International paid overtime to the customs agents on duty from midnight Saturday until 7 a.m. Monday.

A temporary injunction was issued, but after hearing the arguments of the government, Federal Judge Hazel ruled that unless the International Railway pays overtime to the customs agents on duty at the bridges, all passengers will be required to deposit all personal baggage, including pocket books, umbrellas, etc., with a customs agent at the bridge until the customs office is opened at 7 a.m. Monday morning. The court ruled the government is not obliged to keep customs agents on duty Sundays and has the authority to close the port of entry unless the expenses are borne by the bridge company, which is owned by the railway.

Nine and One-Half Cent Fare in Prospect

Following the receipt of the annual report of the Cincinnati (Ohio) Traction Company for the year of 1920, W. C. Culkins has forecasted a further increase in fare on March 1. The fare in Cincinnati now is 9 cents cash, with two tickets for 17 cents.

Although figures submitted by the company show that there were over 1,000,000 more passengers during the past year than in 1919, Mr. Culkins said that an increase in the rate of fare to 9 cents on March 1 may be looked for. Figures were 118,618,860 passengers for 1920 and 117,495,936 for 1919.

Mr. Culkins bases his conclusion on the assumption that there will be no reduction in the cost of materials of labor. Another contributing factor which may mean higher fares, he said, was a possible falling off in the number of passengers.

According to the franchise under which the company is operating an increase of only one-half cent can be made at any time, and this can only be done when receipts for the first two months of the preceding quarter have shown a deficit.

Receipts for December and January will not be submitted by the company until the beginning of February. If Mr. Culkins' prediction proves true that expenses of the company will not be reduced, the receipts for these months will show a deficit and another increase of one-half cent will go into effect, making the fare 9½ cents.

Transportation News Notes

Ten Cents in Atchison.—The City Council of Atchison, Kan., has authorized the Atchison Railway, Light & Power Company to charge a 10-cent fare on its city lines. The new rate is to stand until July 1, 1921, unless further extension is granted by the Council. The 7-cent fare went into effect a year ago.

Car Tickets as Gifts in San Diego.—Many residents of San Diego, Cal., were helped to solve the gift problem during the holidays by the San Diego Electric Railway. The 7½-cent fare tickets, good for ride through inner and outer zones and all transfer privileges, were put up for sale in neat little booklets containing forty tickets, with space on the cover for the name of the recipient and the donor. A large number of these practical gifts were reported sold.

Fare Schedule Continued in Milwaukee.—The rates of fare for the single fare and suburban areas at Milwaukee, Wis., as fixed by the Wisconsin Railroad Commission in its order of June 24, 1920, were to have expired on Dec. 31, 1920, but have been continued by the commission until further order. Before such an order is issued, it is said, another hearing will be held. The single-fare area schedule is 7 cents cash and eight tickets for 50 cents. The continuing order was issued on Dec. 29, 1920.

Higher Rates in Kingston.—The Public Service Commission, Second District, has authorized the Kingston (N. Y.) Consolidated Railway to put into effect on five days' notice a 7-cent cash fare with four tickets for 25 cents. This new rate will be effective for one year or until further orders of the commission. A 6-cent fare was put into effect on the Kingston lines in April, 1919. Several months ago the company petitioned the commission for authority to fix such a rate as it would find just and reasonable.

Commission Claims Power Over Rates. — The Arkansas Corporation Commission has announced that it has jurisdiction to pass upon the reasonableness of rates. It takes this stand notwithstanding the existence of a contract between the utility and the town in which it is operating, and the fact that the Supreme Court of the state has held that a contract between a town and a public utility company is valid as between the parties does not deprive the commission of its jurisdiction to pass upon the reasonableness of the rates fixed in the contract.

Seven-Cent Fare Continues in Lima.—A 7-cent fare will continue for six months after Feb. 1 on the Lima, Ohio, lines of the Ohio Electric Railway. A 7-cent cash fare went into effect on Sept. 3 and the expiration date was set for Feb. 1. The company recently applied for an extension on the ground that it had not profited sufficiently by the increased fare. The Council granted the extension. Mayor F. A. Burkhardt has announced that unless the railway takes steps to improve its service the city will consider a plan for municipal operation.

Eight Cents in Each Zone. — Zone fares on the interurban lines of the Houghton County Traction Company, Houghton, Mich., have been raised from 7 cents to 8 cents by authority of the State Public Utilities Commission. Tickets, each good for a ride in one zone, are being sold at the rate of five for 35 cents. Children between the ages of five and twelve years will be carried for 5 cents in each zone. They formerly paid the same rate as adults. The fare within the city limits of Houghton, Hancock and the other towns served by the railway remains at 5 cents.

Mr. Beeler's Plan Opposed.—The Safety Council at Kansas City, Mo., will launch, as one of its new year activities, a campaign for abandonment of the Beeler plan of loading and unloading street cars in the down town district. L. J. Smyth, director of the council, is reported to have said: "The Beeler plan of loading street cars midway between intersections is fundamentally wrong, so wrong it should be abandoned at once. First it requires pedestrians to cross the streets in the middle of blocks. Intersections are the only safe places to cross. Second, it permits motormen to smash across crowded intersections."

Restrictions on Camden Buses.—An ordinance has been passed by the City Council of Camden, N. J., regulating the operation of jitney buses through the streets of that city. Jitney operators in securing licenses in the future must designate the proposed route, which must be operated every trip. Each car must be equipped with a cash register and reports of receipts are to be turned over to the City Treasurer. Licenses will be granted only to those who have had at least six months' experience. License fees will cost from $100 to $250 according to passenger capacity. The question of jitney regulation in Camden has been pending now for several months.

Bulletin for Nashville Riders.—"Read As You Ride" is the title of a little folder issued by the Public Relations Department of the Nashville Railway & Light Company, Nashville, Tenn., for the use of its patrons while riding on the cars. This interesting little folder is issued every Friday by the railway and contains suggestions by the patrons of the cars for betterment of the service as well as complaints. The company asks the cooperation of its patrons in this manner and gives suggestions by which they themselves may help to increase the efficiency of the service in speed and convenience. A portion of the pamphlet is devoted to anecdotes under the title of "Smiles as You Ride" for the amusement of the passengers.

"Pay-Leave" Cars on Interurban.—The cars of the Union Traction Company of Indiana operating on the line between Indianapolis and Broad Ripple were converted into pay-as-you-leave cars on Jan. 1, when the through fare was raised to 10 cents. Passengers on both inbound and outbound trips are now required to enter by the front door, and to leave by the rear door, paying the conductor as they leave. The company received permission to charge 10 cents for rides between any point in Indianapolis and in Broad Ripple, and 5 cents for a ride within Indianapolis or Broad Ripple. Fifty-third Street is the dividing line from which the fare is computed. The Indianapolis city limit is ninety-four feet south of the center of Fifty-fourth Street, and the Broad Ripple corporation line is in the center of Fifty-fourth Street.

Wants More on Interurban.—A petition has been filed with the Indiana Public Service Commission by the Indiana Service Corporation, Fort Wayne, asking an increase in the present passenger rate of ½ cent a mile on its line between Fort Wayne, Lafayette and Bluffton, making the rate 3 cents a mile. The petition states that increased operating expenses have reduced the company's revenue to such an extent that an increase is absolutely necessary. Several interurban lines operating within the state, now have a 3-cent rate, while the Chicago, South Bend & Northern Indiana and the Winona Interurban Railway have also filed petitions for increased rates. The increase, if granted, would put the interurban lines on an equality with the steam roads, which have had a 3-cent rate for some time.

Reprisal Threatened in Fare Case.—Following the report of the committee of fifteen, which recommended to the City Commissioners of Covington, Ky., that the South Covington & Cincinnati Street Railway should be allowed to increase the rate of fare, citizens took a rising vote and decided that in the event that the increase is allowed they would walk. The fare on the Green Line is still 5 cents. The company has endeavored to show the citizens of the towns in northern Kentucky, through which the company operates, that it is now impossible to give the same service for 5 cents as it has done in the past. Refusal to allow the increase will necessitate the curtailment of service, Polk Laffoon, secretary of the company, said. The bone of contention on the part of the citizens of the northern Kentucky towns is that the railway itself has incurred no deficit, but that the deficit has been caused by subsidiaries of the corporation. The railway's financial troubles began several months ago. Last fall its trainmen demanded an increase in wages. The board of arbitration awarded the men a 60-cent scale.

Personal Mention

Mr. Rifenberick Resigns

Consulting Engineer Retires from Detroit United Railway to Enter Business for Himself

Robert B. Rifenberick has resigned as consulting engineer for the Detroit (Mich.) United Railway. Mr. Rifenberick was born in Cincinnati. In June, 1885, he was graduated from Miami University Scientific Training School. The following year, 1885-86, was spent in the university proper specializing in engineering. Mr. Rifenberick was taken into his father's office as a draftsman, but made it a point to change from one job to another with a view to getting a wide and varied experience.

During part of 1886-87, he was draftsman, levelman, transitman and finally in charge of a party on the railroad projected from Middletown, Ohio, to Louisville, Ky. The fall of 1887 to the spring of 1889 he spent as instrument man on the Duluth, South Shore & Atlantic Railroad construction in northern Michigan. After five years or more spent in engineering work on steam railroads, Mr. Rifenberick engaged for five years as engineer with the New Orleans Traction Company, constructing street railways in New Orleans. He also constructed by contract one of the smaller lines and parts of others. In 1898-1900 he was engaged first in charge of ballasting and relaying steel on the New Orleans & Northeastern Railroad, then as engineer in charge of construction, Cleveland & Eastern Electric Railway, Cleveland to Burton, and later as traction engineer for the city of Cleveland.

From the middle of 1902 to April 28, 1908, he was consulting engineer of the Cleveland Electric Railway. This was during the régime of Tom L. Johnson, Mayor of Cleveland. During this time he played an active part in sixty-one injunction suits in the Cleveland controversy, fifty-nine of which were won by his company.

After spending one year in private consulting practice with offices in Cleveland, Mr. Rifenberick accepted on Feb. 15, 1909, the position as consulting engineer with the Detroit United Railway, from which he has just resigned.

No definite plans for the future have as yet been formulated by Mr. Rifenberick. It is his intention, however, eventually to enter private practice on electric railway construction, operation and appraisal work.

P. F. McCall Promoted

Peter F. McCall, general storekeeper of the Chicago Elevated Railroads, has been appointed superintendent of materials and supplies of the Chicago, North Shore & Milwaukee Railroad. While retaining his position on the elevated system, Mr. McCall's duties have been expanded to include charge of certain work on the Chicago-Milwaukee interurban system. The department of materials and supplies is newly created and it will include the present purchasing department, which handles the purchase of all railway materials, supplies and foodstuffs; the storehouses for railway materials and commissary and supervision of all restaurants.

The purpose of this department will be to consolidate, co-ordinate and bring about the greatest economy and efficiency in the purchase, receipt, and distribution of all supplies, and properly to merchandise the sale of all foodstuffs and supplies sold to the public through the medium of restaurants, concessions and dining cars. The purchasing agent, storekeeper, and superintendent of dining car service of the North Shore Line will report to Mr. McCall. Mr. McCall has been with the elevated system for about ten years.

Van Horn Ely Heads Columbia Graphophone Company

Van Horn Ely, president of the American Railways, Philadelphia, Pa., has been elected president of the Columbia Graphophone Manufacturing Company, New York City, to succeed F. S. Whitten, who has been made chairman of the board of directors. Mr. Ely's connection with the phonograph company as active head will in no way affect his status with the American Railways or the other traction properties in which he is interested.

Mr. Ely was born in Lockport, N. Y., on July 28, 1866. He was graduated from the Lockport Academy in 1884 and from the Buffalo High School in 1885. Three years later he entered the real estate business as a member of the firm of Bell & Ely. He was appointed in 1899 assistant to the president of the International Railway, Buffalo, where he remained for six years. He then resigned to become head of the electric railway and lighting properties serving communities for seventy-five miles along the Ohio River between Pittsburgh and Beaver, Pa., and Wheeling, W. Va. Two years later he incorporated the National Properties Company, a holding company which has acquired public utilities in many cities of the East and Central West. In 1916 the National Properties Company acquired the American Railways, which owns and operates electric light and railway properties in a number of cities, including Wilmington, Del.; Chester, Scranton and Altoona, Pa.; Springfield and Dayton, Ohio; Joliet, Ill.; Huntington, W. Va., and Lynchburg and Roanoke, Va.

Henry Surguy Edits "Aera"

Henry Surguy, editor of *Aera* since the resignation of Harlow C. Clark some months ago, has been connected with activities of the American Electric Railway Association for more than a year, first in charge of publicity for the Committee of One Hundred and later as special contributor to *Aera*. He is particularly well informed on public relations matters and his articles along these lines in *Aera* have attracted unusual attention. Mr. Surguy has not had any direct training along engineering or electric railway managerial lines, but has a background of schooling in journalism and law that bespeaks for him ability quickly to grasp the essentials of electric railway economics, finance and operation.

Mr. Surguy was born in Columbus, Ohio, in 1886. He was educated in the public schools and high schools at Washington, D. C., and was graduated in 1910 from the National University Law School with the degree of LL.B. He practiced law in Fairfax, Va., and in Washington, D. C., in 1911 and 1912. Like Alfred Henry Lewis and other noted editors and writers, however, he foresook law in 1913 to enter journalism. His experience in newspaper work covers practically every position from reporter to editorial writer and staff correspondent. He has been with the Washington *Herald*, the Frederick (Md.) *Post*, New York *Herald*, Hot Springs *Telegraph*, the Richmond *Times-Dispatch*, and more recently has been city editor of the Washington *Herald*, news editor of that paper, and staff correspondent of the Washington Bureau of the United Press Association. Finally after service in 1917 with the United States Marine Corps in the Champagne Sector in France, he returned to New York to become staff correspondent of the New York *American*.

Chester M. Rowell, Commissioner

Governor Stephens of California recently announced that Harvey D. Loveland would be appointed to succeed himself as a member of the State Railroad Commission on Jan. 1 last and that Chester M. Rowell, Fresno, would be appointed to succeed E. O. Edgerton. Mr. Rowell will return at once to Washington to conclude his work as member of the United States Shipping Board, returning to California on Feb. 1 to assume his duty as Railroad Commissioner.

Mr. Rowell has been prominently identified with politics for a good many years in the State of California, and has for some years been the owner and publisher of one of the State's best known newspapers at Fresno.

Recently Mr. Rowell retired from the newspaper field by disposing of his newspaper holdings at Fresno, and it was reported that he was to affiliate himself with one of the San Francisco papers in the capacity as editor. His appointment to the commission disposes of this report.

Henry W. Blake Honored

Thirtieth "Milestone" Dinner Tendered to Senior Editor of the "Electric Railway Journal" by His Associates in the McGraw-Hill Company

Thirty years ago this month H. W. Blake, now senior editor of the Electric Railway Journal, joined the editorial staff of what was then the *Street Railway Journal*, a connection which he has held continuously and devotedly for thirty consecutive years. In appreciation of this unique editorial record, and as a milestone in his relations with the McGraw-Hill Company, his associates tendered him a dinner on Thursday evening, Jan. 6, at which many reminiscences of the *Street Railway Journal* and the Electric Railway Journal and Mr. Blake's editorial activities in connection therewith were reviewed.

HENRY W. BLAKE HAS GIVEN THIRTY YEARS OF SERVICE TO THE "ELECTRIC RAILWAY JOURNAL"

After graduation in 1886 from Yale as a civil engineer Mr. Blake took a course in electrical engineering in the Massachusetts Institute of Technology and then became connected with the Sprague Electric Railway & Motor Company, handling advertising and publicity work for the company. When Mr. Blake came to the Journal in 1891 the argument between cable and electric advocates was at its height, not to mention such minor antagonists as the compressed air car, storage battery car, combustion engines, etc. Heavy electrification of any sort, such as the Baltimore tunnel work, was still four years away. In short, the young editor came to the *Street Railway Journal* during a period of unparalleled activity of invention, promotion, financing and construction.

With a technical knowledge rare in those days, a flair for seeking nothing but the facts in all the welter of contradictory claims and with a memory of marvelous tenacity, Henry W. Blake soon proved to be the one man for the job. In 1894 he became editor-in-chief, with results to the paper that speak for themselves. For as one of his longtime associates put it: "Mr. Blake has written his very life into the columns of the Electric Railway Journal, which stands as a monument to his thirty years' endeavor."

As an editor Henry W. Blake stands out pre-eminent for his sense of fairness, for his well-nigh universal knowledge of the field and for what editors among themselves call "balance"—the just apportionment and interpretation of news values.

As an employer Henry W. Blake has always been noted for the quality best described by that fine English word "gentleman." To imagine any harshness toward a subordinate as coming from Mr. Blake is inconceivable.

As a man and a figure in the industry Henry W. Blake has made and held thousands of friends partly through the charm of his personality, partly through his willingness always to give to the inquirer of his truly amazing knowledge of mass transportation from the days of the horse-bus to the last word on its rubber-tired gas and electric successors and all that has been developed in between. The influence of such a man in such a position cannot be measured, but it can be and has been felt in every department and on almost every electric railway throughout the world.

As a tangible remembrance of the occasion, Mr. Blake's friends in the McGraw-Hill Company presented him with a de luxe edition of Gibbon's "Decline and Fall of the Roman Empire." His associates, however, felt that for once in his career Henry W. Blake should step into the limelight, so contrary to his modest nature. Hence the present remarks from those who have and will continue to work with and for him to keep the Electric Railway Journal in the front rank of technical journalism.

Trainmen Honor Colonel Kealy

One hundred and twenty-five officers and members of committees of the employees' organization of the Kansas City (Mo.) Railways gave a luncheon on Jan. 5 in honor of Col. P. J. Kealy, upon his retirement from the active supervisory management of the property. The luncheon was planned and arranged by committees of the employees, as a result of suggestions emanating from employees. Several officials of the company attended as invited guests. The event was notable as a tribute of personal regard and respect of all employees for Colonel Kealy, and as an expression, through these representatives, of the recognition by the body of employees, of the cordial spirit that has developed between company and men in the past few years, and of the efficient program of co-operation between company and employees for rendering public service.

R. L. Kimbrough, chairman of the Employees' Central Committee, presided. F. G. Buffe, continued as general manager under the receivership and joint author with Colonel Kealy of the employees' participation plan; D. L. Fennell, superintendent of transportation, who had a large part in the institution and operation of this plan; Warren Fisher, president of the Employees' Brotherhood, and other officers and employees spoke.

James Holt, committeeman from the shops at Ninth Street and Brighton Avenue, on the part of employees, presented a watch to Colonel Kealy, as evidence of their appreciation of his part in the building of the co-operative plan for service to the public by men and company and as a symbol of the personal popularity of Colonel Kealy.

Colonel Kealy, responding, said that the good judgment of the men in adopting the co-operative plan had been vindicated, for under it there had been great improvement of service to the public and material benefit to the employees. Colonel Kealy said:

> Participation of the employees in ownership of stock of the company will come eventually, as the virtues of the plan get results in improved conditions for the men, in better service, and larger earnings.
>
> While returns on the investment of the owners are a paramount consideration in the operation of a utility, such returns are not possible nor to be expected unless service to the public is efficient and the wages and conditions for employees are such as will enable them to live like good citizens. A company that cannot pay proper wages has no business to exist. It should quit as soon as possible. The scheme of co-operation under which we have been working together, employees and management, for two years, provides for the two important factors, proper wages and efficient service, upon which adequate revenue depends.

"Fred" Handshy Climbs Another Notch

Veteran Operator Made General Manager of Interurban Lines of the Illinois Traction System—Other Promotions

New Year's Day had in store a pleasant surprise for C. F. Handshy of Springfield, Ill. Mr. Handshy received a number of greetings on Jan. 1, but the one which gave him the most pleasure and which, incidentally, called forth many of the others, came from H. E. Chubbuck, vice-president executive of the Illinois Traction System. Mr. Chubbuck's "best wishes" took the form of a notice to Mr. Handshy that he had been promoted to general manager of interurban lines of the system. Mr. Handshy was not the only executive to receive this sort of message from Vice-President Chubbuck. A number of superintendents of city lines included in the McKinley group of properties learned that they too had been promoted, their titles in each case being changed to general manager.

THE general superintendents of city lines who have been made general managers are: J. E. Johnson, Danville Street Railway & Light Company; M. L. Harry, Decatur Railway & Light Company; D. W. Snyder, Bloomington & Normal Railway & Light Company; R. F. Carley, Galesburg Railway, Lighting & Power Company; E. A. Roehry, Cairo Railway & Light Company; F. E. Bell, St. Louis Electric Bridge Company, and Missouri properties; L. W. Hess, Northern Illinois Light & Traction Company; F. E. Fisher, Chicago, Ottawa & Peoria Railway, and E. H. Gray, Jacksonville Railway & Light Company.

"Fred" Handshy is one of those traction executives who have come into the electric railway field via the steam railroad route. He entered the employ of the Wabash Railroad in 1884 as a telegraph operator. Six years thereafter he became a train dispatcher for the same road, and in 1902 was promoted to the position of assistant chief dispatcher, with headquarters at Decatur, Ill. Two years later he succeeded to the position of chief dispatcher and later to that of trainmaster.

Mr. Handshy entered electric railway work in 1907 as general superintendent of transportation of interurban lines of the Illinois Traction System. Three years later he was promoted to general superintendent of interurban lines, and on June 1, 1913, he became assistant general manager. He served as president of the Illinois Electric Railway Association in 1917.

Mr. Handshy brought to the traction field a knowledge of operating methods which has undoubtedly been a great influence in the development of the electric lines of the country, particularly those of the Middle West. His initial engagement with the McKinley System came during its construction and formulative period.

During his connection with the system the idea of using trains made up of a motor car and trailer coaches was inaugurated. This idea was later developed into the successful use of motor cars to pull parlor cars, sleeping cars and express cars. The use of heavy locomotive-type express cars to pull trains made up of coaches, sleepers and express cars has proved to be very successful and the practice is still followed on the lines of the Illinois Traction System.

This was also among the first properties to develop the idea of trains operating over long distances. It has also been during Mr. Handshy's connection with the system that block signals have been installed. Another important development has been the hauling of freight on a scale comparable with steam road practice and the use of belt lines to shunt such traffic around cities through which the lines passed. In these respects also the Illinois Traction System was among the first to adopt the practice.

C. F. HANDSHY

Obituary

J. B. MacAfee, Railway Builder

John Blair MacAfee, organizer and formerly manager of many electric railway properties in the East and Central West, died in England on Jan. 11 following an operation. Mr. MacAfee had resided for a number of years in London, where he was active in banking and financial circles, being chairman of MacAfee & Company and of the British-American Continental Bank. He was also chairman of the finance committee of the American Chamber of Commerce in London and treasurer of the Royal Institute of Public Health.

Mr. MacAfee was born in St. John, New Brunswick, in 1861. Removing to Philadelphia at an early age, he attended the University of Pennsylvania and was admitted to the Philadelphia bar. He practiced law until 1892, when he took up engineering work. He subsequently organized the Raritan Construction Company and built several electric lines in New Jersey, including those of the New York & Philadelphia Traction Company and the Central New Jersey Traction Company, now a part of the system of the Public Service Railway, controlled by the Public Service Corporation of New Jersey.

Still later Mr. MacAfee became president of the American Engineering Company, which built the Newton Electric Railway and the Elmira & Seneca Lake Railway and the line between Kalamazoo and Battle Creek, Mich. He then served as vice-president and general manager of the Railways Company General. In 1899 he built the system of the Ohio River Electric Railway & Power Company and was identified with the building of the New Orleans & Pontchartrain Railway. Then followed the building of the Augusta-Aiken Railway, of which he later became president. He also served at one time or another as president of the Norfolk & Portsmouth Traction, the Pomeroy & Middleport, the Central & Kentucky Traction and the Blue Grass Traction Companies, and of the Lexington Railway. He retired from his active connection with these properties about ten years ago to go to England. At the time of his death he was a director of the Kentucky Traction & Terminal Company and of other public utility properties in the United States.

William Robinson, Ph. D., inventor of the Robinson radial truck which was used at one time extensively for electric cars, especially in New England, died in Brooklyn, N. Y., on Jan. 2. Dr. Robinson was an inventor and patentee in other fields than the electric railway, specializing on block signals. A number of his patents, covering the use of rail circuits, were acquired later by the Westinghouse interests. Dr. Robinson was eighty years old at the time of his death. During the time when Dr. Robinson's truck was on the market it was built by the Robinson Radial Truck Company of Boston.

Alva E. Moore, well known to many electric railway men in Indiana, died on Dec. 24 last in a hospital at Aberdeen, S. D., following an automobile accident. Mr. Moore was a traveling auditor for the Chicago, Milwaukee & St. Paul Railroad. He was formerly connected with the general offices of the Union Traction Company of Indiana, serving as an auditor and later as assistant division passenger and freight agent. He went to Chicago four years ago and became a traveling auditor for the Illinois Central Railroad, later taking employment with the Chicago, Milwaukee & St. Paul.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES   BUSINESS ANNOUNCEMENTS

Stock Deliveries of Cartridge Fuses

Buying for Heater and Lighting Circuit Use Is Considerable, Though Only for Current Needs

Current buying of cartridge fuses by electric railways is not large judged by what manufacturers consider a strong demand. Nevertheless, the absolute needs of traction companies for fuses used with heaters, lighting circuits, etc., are sufficient to account for no inconsiderable volume of business, and orders of this "necessity" type are being placed right along. The fact that railways are not trying to accumulate considerable stocks of cartridge fuses for their future needs is no doubt influenced by the rapidity with which orders can be filled at present.

During much of 1920 fuse manufacturers were hampered by unfavorable production conditions and many of them fell far behind on orders. Until quite recently one of the large producers was running both day and night shifts. With the general falling off of demand and the improvement in production, however, these conditions have become gradually reversed. Some factories are now laying off numbers of workmen; back orders, while still existent in a few cases, are pretty well brought up to date, and in general shipments can be made from stock.

Prices have remained stationary for some time, and though no immediate reductions are seen the general price tendency, in view of the copper and insulation trend, would appear to be downward.

Business Is Fundamentally Sound

Ten reasons were given by Roger W. Babson when he appeared before the Chicago Association of Commerce on Jan. 7, as to why conditions in the business field are fundamentally sound. These are that the Federal Reserve System is successfully functioning; that 80 per cent of Liberty Bonds are still in the hands of the original purchasers; the effect of prohibition in releasing large sums of money for savings and investment, resulting in better living conditions; the development of national advertising and better resulting national distribution; the development of standardization in all lines of manufacture; the improvement in the elimination of seasonal fluctuations in business; the economic education of the public; the wonderful crops of the past year, which despite very much lower unit prices, have brought to the farmers almost as large a sum of money as they received for their crops the year before; our great merchant marine, and the lesson of the last election that radicalism cannot sway the country.

In discussing the troubles of the business world, Mr. Babson gave it as his opinion that the beginning of the end of a period of prosperity was marked when 51 per cent of the people turned from purposes of service, thrift and honest dealing, to selfishness and extravagance. Likewise, when 51 per cent turned from selfish interests to service, this marks the beginning of better times. It was his view that the bottom of business depression would be reached in a few months, and that while complete recovery might take two or three years, there would be a gradual process of improvement.

Quiet Market for Fenders and Wheel Guards

Buying of Repair Parts Is Normal—Good Deliveries—Safety Car Equipments Shipped from Stock

Buying of repair parts for car fenders and wheel guards by electric railways is proceeding in about normal volume, through orders come spasmodically and do not bulk very large. The market for complete equipments is rather quiet just now following the good sales that were made in the past year. Orders for car fenders and wheel guards are for the most part dependent upon the buying of new cars and right now the demand is not very heavy. Manufacturers report that during the last year or so they have experienced a fair demand for equipments on behalf of old cars that were being fitted with up-to-date safety appliances.

Conditions of supply in this market are excellent as labor and raw material are now favorable factors. Fenders and guards for safety cars, being practically a standard article, can be shipped from stock and a good reserve supply of repair parts sufficient to care for all needs promptly is also carried. Equipments for other cars, however, can not be shipped from stock as their manufacture is according to specification and the quickness of delivery varies. In general it can be said, however, that shipments are good. No price change has come about yet.

Manufacturers are optimistic over the volume of business which they think should develop during the present year, for with improving financial conditions the necessary rehabilitation of rolling stock, it is hoped, will result in good buying of fenders and wheel guards by car builders.

Several Months Required to Get Insulators

Demand for High-Tension Porcelain Material Keeps Factories Busy Although Present Buying Is Slow

Deliveries of porcelain high-tension insulators, though improving, are still long, despite the fact that comparatively few new orders are coming in just now. Manufacturers have enough old business on the books, however, to carry them well along through the first half of the year. It is this circumstance, coupled with production difficulties, that has caused new orders to stand scant chance of being filled promptly. One of the difficulties mentioned has been the short supply of natural gas upon which some manufacturers depend for firing their insulators. Another has been raw material, though recently the latter has almost ceased to be a factor affecting production adversely. Production, as a matter of fact, in several cases is increasing and the capacity of some plants is also being enlarged.

FOREIGN MARKET PROMISING

Although manufacturers are warning their customers to enter the market now if they expect to make new power extensions during 1921, the prospect of long insulator deliveries does not seem to have hastened buying. In fact, demand from home and abroad has been dropping off and is light at present. Good prospects for insulator buying are said to exist in Italy, Switzerland, Japan and Scandinavia. Just when the large need for insulators that is known to exist in this country and abroad will result in orders being placed, however, is a question. Prevailing exchange rates, on the one hand, and tightness of money, on the other, have a deterrent effect on buying. Expectations of lower prices may also be a consideration, though producers offer little hope of prices changing for some time. Wages remain unchanged at insulator plants, it is stated, and no employees have been laid off, so far as can be learned. The raw material, being mostly a complete product of nature, is not subject to great fluctuation, and costs are no lower there.

Deliveries, generally speaking, probably average three to four months, though extremes of two to six months, and even seven occasionally, are quoted, depending upon the size and type of insulator and the manufacturer. In some cases suspension insulators are worse off than pin types as regards supply, and in others better. Surplus stocks, of course, do not exist anywhere.

Pole Material Prices Lower

Crossarms, Pins and Hardware Reduced—Stocks Ample to Care for Light Demand

Buying of wood poles, crossarms, pins and pole hardware is in general light, but with the comparatively open winter to date it is hoped that central stations and railways will consider their line needs earlier this year. The exception to light buying is found in the Atlanta district where there is a good movement of this material.

Stocks in distributers' yards are good, for the most part, but there is reported only enough line hardware to care for the present demands. There seems to be no excess of it. Wood materials can be had in the East on deliveries of about two weeks. Last year stocks were good at the mills and cutting yards but very poor in distributers' yards. In the San Francisco territory stocks of crossarms are better than for several years, while decreasing business by local lumber companies has resulted in a crop of vigorous competitors for crossarm business.

Six-pin, 6 ft. x 3¼ in. x 4¼ in., Rainier fir crossarms in New York sections in 3,000 to 5,000 linear-foot quantities are quoted $114.68 per 100 arms, price reductions of about 10 per cent having been made early in December. Yellow pine arms, same conditions, are $95.98 per 100 arms. In the southeast, standard fir arms, two-pin, 4-ft., lots of 1,000 linear feet and over, are 62 cents each; four-pin, 4-ft., 83 cents. N. E. L. A. fir arms, two-pin, 3-ft., 93 cents; 4-pin, 5-ft. 7-in., $1.41 each.

Locust pins, 1½ in. x 9-in. in lots of 5,000 are quoted in New York at $38.75 per 1,000, and in Atlanta $42. The 1¼-in. x 8-in. pins are $27.15 in New York, $25 in Atlanta and $30 in St. Louis.

Hot galvanized crossarm braces, 1 7/32 in. x 7/32 in. x 24-in. are quoted in New York at $120 per 1,000 in 500 lots; in Chicago they are quoted $155.03 in 500 lots and $137.80 in larger lots. Crossarm bolts, ⅝-in. x 10-in., in New York bring $10.92 per 100 for 500 bolts and in Chicago $13.71 per 100 for 500 bolts and $12.19 for larger quantities.

As far as has been learned there has been no price decrease applied to wood poles.

Window Glass Prices Firm

Were it not for the slump in the building industry the window glass market during 1920 would have presented a famine aspect. As it was, it was not until recently that manufacturers were anywhere near caught up on back orders. One reason for the scarcity was the shutdown of European factories during the war and the curtailment of domestic production during the same period. Following the dangerously low point to which window glass stocks became reduced came shortages of labor, raw material and transportation tie-ups. As a result several producing interests practically were out of the market for a long time. Double-strength glass which is used in car windows was particularly scarce.

Recently demand has lessened and reasonable shipments can be made from stock up to three weeks' time. No likelihood of lower prices very soon is held out, however, especially in view of current demands for higher wages by independent workers and low gas fuel supply.

Senator Calder Seeks to Regulate Coal Industry

Production, Ownership, Sale and Distribution of Coal Charged with Public Interest and Use

Senator Calder of New York, chairman of the United States Senate's committee on reconstruction, which has just concluded an investigation into the bituminous-coal situation, on Wednesday of this week introduced a bill which seeks to regulate the coal industry of the United States and declares the ownership, production, sale and distribution of coal throughout the country to be "charged with public interest and use."

By the provisions of this bill coal operators and others engaged in the coal business must give to the government at stated intervals complete reports as to their business activities. It gives to the President of the United States in any period of emergency the right to fix maximum prices, to direct production and distribution and, if need be, to engage in the sale of coal to the people.

In commenting upon his bill Senator Calder accused the coal operators of engaging in biased and self-serving methods of publicity and of concealing the facts of the coal situation from the public. Profiteering, he asserted, had been proved and admitted, but a controversy exists as to its extent and its promoters and beneficiaries. The bill aims to make such practices impossible. It does not set up any new governmental machinery, but utilizes the experienced agencies in existence, chiefly the Federal Trade Commission, the Interstate Commerce Commission and the Geological Survey.

Rolling Stock

Alabama Power Company, Birmingham, Ala., has on order two safety cars for its Gadsden division and is also in the market for two closed, double-truck trailers.

San Diego (Cal.) Electric Railway Company received 25 new Birney safety cars on Dec. 19 for operation on its lines where travel is light. The new cars are 28 ft. in length, weigh about 8 tons and seat thirty-two passengers. The company will continue to operate the large two-man cars on the lines where traffic is heavy.

Recent Incorporations

Shore Line Electric Railway, Norwich, Conn.—A petition requesting the Legislature to grant a new charter to new owners of the former property of the Shore Line Electric Railway has been filed with the Secretary of State. It is stated that Mr. Levinson bought the New Haven-Chester line and property of the Shore Line and will start operations with a capital stock of $600,000.

Woodbridge Street Railway, Woodbridge, Conn.—The Woodbridge Street Railway will apply to the Connecticut Legislature some time in January for a charter to build a railway which will connect with the Connecticut Company's Whalley Avenue line at Pond Lily near New Haven and will run out into Woodbridge. The new line will be about 1½ miles in length. The incorporators are: Adam Ziegler, Michael J. Quinn and William B. Turley, all of whom are interested in the Woodbridge Trap Rock Company. Judge Burpee of the Superior Court has notified all people interested in the petition to appear before the General Assembly and give their opinions.

Track and Roadway

Alabama Power Company, Gadsden, Ala.—The Alabama Power Company has authorized the expenditure of $100,000 in improvements in its Gadsden division. This includes the replacing of several miles of small rail with larger relay rail and the rebuilding of certain parts of the overhead system where replacement is needed.

St. Petersburg-Tampa Railway, St. Petersburg, Fla.—R. E. Ludwig, director of public utilities for the city, has asked the City Commission to issue short-term bonds for $65,000 for two extensions of the municipal street railway system—the First Avenue loop and the Ninth Street extension from Central to Seventh Avenue, the total to be approximately 1 mile of track. The commission has instructed the city attorney to call an election for the bonds. Several citizens have come forward with pledges of from $1,000 to $5,000 and indications are the entire issue will be subscribed before it is offered.

Evansville, Ind.—There is agitation for a union traction station at Evansville, Ind. At the present time there are two traction stations in that city, one on Fifth Street and the other at the corner of Locust and Second Streets. The stations are about two blocks apart. The Fifth Street station is used by the Evansville & Boonville line and the Evansville, Suburban & Newburg road, while the station at the corner of Locust and Second Streets is used by the Ohio Valley Railway, the Rockport and Grandview line, the Mt. Vernon line and the Evansville & Henderson line.

Power Houses, Shops and Buildings

Cincinnati (Ohio) Traction Company.—The Cincinnati Tracton Company plans to purchase part of the power it requires for operation of its lines from the Union Gas & Electric Company. Automatic substations are now being planned by the company. W. C. Culkins, director of Cincinnati's street railways, favors the purchase plan and believes it will mean a considerable saving to the railway.

Hagerstown & Frederick Railway, Frederick, Md.—Electricity generated by water power was switched in over the high tension wires of the Hagerstown & Frederick Railway on Dec. 18 from the plant of the Northern Virginia Power Company at Millville, part of the Hagerstown and Frederick Railway's power system. Fully $250,000 has been expended on the recently acquired Northern Virginia Power Company by the interests backing the Hagerstown & Frederick Railway.

Trade Notes

Léon Chapuis, 36 Boulevard Magenta, Paris, France, distributer of electric railway supplies, would like to secure catalogs of American manufacturers of supplies of all sorts in this field.

The Pawling & Harnischfeger Company, Milwaukee, Wis., has increased its authorized capital stock from $1,000,000 to $3,000,000. This new issue is to cover an extensive plant development. The company manufactures electrically driven traveling cranes.

E. W. Charland, Tilton, N. H., manufacturer of mica insulating materials, is enlarging his plant and installing new machinery to cut and to grind mica. When improvements are completed 1,000 lb. of mica washers will be cut per day.

The Whiting Foundry Equipment Company, Harvey, Ill., announces that it has changed its name to Whiting Corporation and increased its authorized capital stock from $700,000 to $3,000,000. The company remains under the same management and will manufacture cranes, foundry equipment and railway specialties, as heretofore.

The American Chamber of Commerce in London, 8 Waterloo Place, Pall Mall, London, S. W. 1, England, has issued a year book of this chamber for 1920, in which are listed the names, addresses and business classification of more than 1,000 Americans and British firms, including electrical manufacturers, interested in developing business between the two countries.

The Conveyors' Corporation of America, Chicago, announces the appointment of the Hallidie Machinery Company, L. C. Smith Building, Seattle, Wash., as its representative in Washington and Oregon. The Hallidie company is twenty years old. Philip Rowe is president, W. S. Dyson vice-president, Archie McLean secretary, and George Henderson treasurer.

J. A. Robinson has been appointed Western sales agent of the Consolidated Car-Heating Company with headquarters at 1814 Fisher Building, Chicago. Mr. Robinson, who succeeds C. A. Eggert, recently resigned, was previously with General Electric Company and for the past several years has been in the mechanical department of Consolidated Car Heating Company.

Falls Rivet Company, Kent, Ohio, has just purchased from the Ohio Wire Goods Manufacturing Company, Akron, Ohio, all the machinery, patents and patterns relating to the manufacturing of cotter pins and flat spring keys. The machinery has been moved from Akron to Kent and is now in operation. The Ohio Wire Goods Company will discontinue the manufacturing of these articles and the Falls Rivet Company will add to its product of rivets, bolts and nuts for the railway trade.

Manistee Iron Works Company, Manistee, Mich., manufacturers of Roturbo centrifugal pumps, vacuum pumps, rotary jet condensers, etc., has established a Pacific Coast office in the Rialto Building, San Francisco, Cal., in charge of L. M. Page, formerly salesmanager of the company for the past five years. The company expects to open branches also at Los Angeles, Portland, Ore., and Seattle, Wash., which will be under the supervision of Mr. Page.

The Transit Equipment Company, New York City, dealer in used railway equipment, through its president, R. W. Marshall, has taken over three acres of ground from the Batavia Car Works, Inc., Batavia, N. Y., of which company Mr. Marshall is vice-president and general manager. The company will erect a two-story brick building on the ground, 100 ft. x 150 ft., which will be used for rebuilding used motors, controllers, etc.

Fowle & Cravath, electrical and mechanical engineers, Monadnock Bldg., Chicago, Ill., has discontinued business owing to the withdrawal of James R. Cravath from the firm. Mr. Cravath moves to California because of the ill health of one of his family, but Frank F. Fowle announces that the new firm of Frank F. Fowle & Company will continue business at the above address, covering the same field as heretofore. The services of Mr. Cravath will still be retained in an advisory capacity.

The Star Brass Works, 3114 Carroll Avenue, Chicago, manufacturer of cooling systems, painting and spraying machinery, announces that on and after Jan. 1, 1921, the company name will be changed to Binks Spray Equipment Company to conform more nearly with the nature of the products manufactured. Announcement is also made of the completion of a new plant and office extension on the west wing of the old plant, in which provision is made for new salesrooms, testing laboratories and increased manufacturing facilities on the first floor, with new offices and drafting rooms on the second floor. The new addition was necessary by reason of the rapid expansion of the business.

The Standard Underground Cable Company, Pittsburgh, Pa., announces that Richard G. Harris succeeds John P. Bell as Pacific Coast manager. Mr. Bell will hereafter devote his time to the growing demands of his export and import business. Mr. Harris has been connected with the organization since 1909 and for the past eight years has been manager of the Montreal office territory of the Standard Underground Cable Company of Canada, Ltd. Vinton Smith, who has been with the San Francisco office staff for several years, has been appointed assistant Pacific Coast manager. W. G. Stearns, also for many years with the company on the Pacific Coast, has been appointed special sales agent.

New Advertising Literature

Recorders.—The Foxboro Company, Inc., Foxboro, Mass., is distributing bulletin No. 114, covering its Foxboro-Heath CO_2 recorder.

Safety Disconnecting Hangers.—The Thompson Electric Company, 226 St. Clair Avenue, N. E., Cleveland, Ohio, has issued catalog B-19, describing the new underslung feature of its safety disconnecting hanger.

Electric Arc Welding.—The U. S. Light & Heat Corporation, Niagara Falls, N. Y., has issued bulletin 700, entitled "Electric Arc Welding," in which it describes "USL" arc-welding machinery.

Coal Combustion.—"Automatic Combustion Control," descriptive of the Gray system of automatic control, is being issued by the Automatic Fuel Saving Company, 549 West Washington Boulevard, Chicago.

Testing Equipment.—The Delta-Star Electric Company, 2433-2453 Fulton Street, Chicago, is distributing a leaflet describing its 40,000-lb. testing equipment for mechanically testing insulators, bus supports and switches which will be subject to heavy mechanical stress.

Headlight Projectors and Reflectors.—Crouse - Hinds Company, Syracuse, N. Y., has issued bulletin No. 304-A, effective Dec. 15, 1920, a sixteen-page, illustrated booklet, which lists Imperial Floodlight Projectors and Imperial Reflectors developed since the publication of bulletin No. 304, which is still in effect.

General Electric Company: Bulletin on "Automatic Station Control Equipment," No. 47,730. This is an illustrated discussion on the whole subject of automatic control. It contains a partial list of automatic stations installed by the company and also a bibliography of this subject from 1913 to date.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. B. ANDERSON, Assistant News Editor

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Cleveland Keeps Down Cost of Track Construction

IN THE issue of this paper for Jan. 8, 1920, the news columns carried an announcement of a 20 per cent cut on Jan. 1 in the wages of track laborers in Cleveland, together with a 15 per cent cut for shopmen to be made on Feb. 1. These are among the first, if not the first, substantial cuts in wages of track and shop men to be made in the electric railway industry. Other industries recently have been forced to cut wages or shut up shops, and in numerous instances employees of late have asked for wage cuts in preference to idleness.

Were it not for the gains in cost reductions incidental to the introduction of machinery in the track construction field it is doubtful whether the street railways could have borne even as well as they have the remarkable wage rise in track labor, not to speak of other labor. Something would have happened long ago. Reference need only be made to C. H. Clark's article in the issue of this paper for Feb. 21, 1920, in order to get a clear idea of the value of "machine-made" track as a means of keeping down costs.

The Cleveland wage cut may be taken as indicative of the arrival of the time when electric railways must fall in line with other industries and get back toward pre-war "normalcy" in their payroll costs if they expect to enter upon the road to financial recovery. Cleveland has also shown the way heretofore in adopting machinery to offset rising costs of track construction. With renewed efforts there may be expected still greater cost reductions through the use of more and better machinery, and the latter, combined with wage reductions, introduced as conditions warrant, should go a long way toward putting our utilities upon their feet.

Electric Railway Work Ought to Appeal to Young Engineers

WHILE construction is at a low ebb on electric railway properties at the moment, there is still presented a wealth of interesting problems of an engineering character. Assuming for the purpose of argument (and only for this purpose, mind you, for it isn't so) that the pay of engineers in this field is what it ought to be, it will be worth while to consider the attractions other than financial of the electric railway field for this class of trained men. Electric railway transportation will always rest on a civil-mechanical-electrical engineering foundation. It must do so as long as rolling-stock moves over track structure, impelled by power mechanically produced and electrically transmitted.

One might conclude that by this time all of the essential electric railway engineering problems had been solved. Far from it! New ideas in car design, track structure, paving, shop practice, power generation, power transmission, etc., are being evolved now as vigorously as ever, although not in such sensational fashion as of yore. This means that fresh engineering talent must be enlisted. Money is scarce in this field, of course, but this fact is in itself a challenge to the real engineer, whose function and joy it is to produce results promptly with the facilities that he can get. Any fool can get results if he has funds and time enough.

Finally, engineering can be the stepping stone to administrative position, if the engineer is gifted with the proper qualities. An increasing number of superintendents, managers and better are fundamentally engineers. May their tribe increase!

Swat the Swindler and Save the People's Money

THE week that concludes today has been called Franklin week because it was hoped thereby to revive interest in the homely but wise maxims on the desirability of thrift, long associated with the name of Benjamin Franklin. The proverbs of Poor Richard are especially worth remembering today when the world is endeavoring to recover from the most severe upset in its history and when on each member of society there rests the duty of repairing so far as he can the havoc wrought by war.

But the thrift movement means more than simply to save money. It includes also the wise investment of the amounts saved, and the need for intelligence in investment is shown by the recent estimate that $250,000,000 is lost by the public each year in bogus stock schemes. By a coincidence this sum just about equals the requirements of the electric roads in 1921 for refunding their maturing obligations.

It is a sad commentary on the gullibility of human nature that fraudulent schemers can get money where legitimate enterprises cannot secure it, or can secure it only with great difficulty. This leads up to the questions (1) how can this stream of investment be turned into legitimate channels and (2) how much of it could be attracted to investment in utilities. If the present thrift movement is at all extended the sum thus to be protected from fraudulent promoters will be considerably more than $250,000,000.

As for the first question, education and more rigorous prosecution of the swindlers are the best answers. Most states now have blue sky laws as a basis for prosecution. Education on the fundamental principles of investment should also be conducted, and here the local banks and such organizations as the Y. M. C. A. and even the public schools could help. In such national movements no particular form of permanent investment could be singled out as being preferable. Nevertheless, while the utilities would indirectly profit by any increase in investment funds, their securities would probably often be chosen for investments of the kind under consideration. For this purpose they have the advantage that they are a well-known form of corporation whose property is visible, that they supply a necessity and that their finances and capitalization are supervised to a considerable extent by the state. Moreover, at present interest rates their securities can be offered at very attractive prices. The return may not be as high as that promised by fraudulent promoters who have no intention of paying back anything, but it is sufficient, especially in view of the probability of increases in security prices, to constitute a "real bargain."

Some utilities, especially among the lighting companies, have been successful in selling stock, usually preferred stock, over the counter, and it is hoped that others will do the same. Such securities will have to be well advertised and put out in such denominations as will appeal to the small investor. Some electric railways may think that a plan of this kind for selling securities is not dignified, but they must bear in mind that they are endeavoring to reach a different class of security holder than in the past. They have a good thing, and they ought to know how to sell it.

Indiana Utilities Unite for Common Task

REPRESENTATIVES from all classes of public utilities in Indiana gathered in Indianapolis on Jan. 13 for the first annual meeting of the Indiana Public Utilities Association. This association was formed a year ago to finance and sponsor the Indiana Committee on Public Utility Information as a means of promoting better public relations. The meeting just held was simply an expansion of this original object, for it has been realized that much remains to be done in educating the utility operators themselves in the necessity for educating the public, and in how to go about it.

Planned with this object in view, the first meeting proved to be a splendid success. The attendance was large and the addresses pertinent and very interesting. Many utility operators went back home with a new conception of their obligations to the public, a fuller realization of why the public has not understood them and a better understanding of what activities and policies hold promise of restoring lost confidence. The result of this awakening of all classes of utilities to their common task should be a considerable uplifting of the public relations situation in Indiana during the next year.

One of the outstanding addresses of the meeting was that by E. K. Hall, a prominent telephone man. It appears in part elsewhere in this issue. Significant among his thoughts were these:

The utilities have only recently come to realize that it is service they are selling and not telephone instruments, lamps, etc. The mistakes made during the development of the art have been corrected and fully atoned for. With this done, the public should be interested now in making and keeping the utilities strong enough to do their job; in other words, we are ready to enter the second era of regulation. The only thing against which the public now needs to guard is too low rates. Within the fraternity it is the duty of the utilities to take to task any utility company not playing fair and square with the public. Every company must first be deserving of sympathetic consideration before seeking favorable public opinion. But deserving this, it is the duty of the utilities to expose crank politicians who do not represent the will of the people when they deride the utilities. And finally, utility men should stop sobbing and apologizing and should actively take the offensive.

A Cheering Example of Co-operation in New Jersey

THE action of the platform men of the Public Service Railway in initiating a proposition to help the company in meeting the present crisis is worthy of more than passing notice. What the men did was explained briefly in last week's issue of this paper. In a word, they proposed that their basic day be ten hours with relief for meals, in place of nine hours without relief, and that the schedules be so arranged as to minimize idle time. The net result to the company is that more employees are available to man cars during the rush hours when they are most needed and that overtime pay is minimized. As for the men, a few of them receive less overtime wages, but the pay is more uniform for actual platform work. Incidentally but very important is the fact that by their voluntary action, taken as a union local, the men showed a fine desire to help the company management solve the jitney and other pressing problems now confronting it.

An understanding of the background of the Public Service Railway labor situation is necessary to a proper appraisal of the present pleasant incident. To go way back before the war, it will be remembered that the relations of men and management on this property were then very satisfactory. There was a large proportion of "veterans" among the men and the whole force was on amicable terms with the men higher up.

Then came the cataclysm of 1917 with its demand on the country's citizenry for men for war service. This demand took 75 per cent of the Public Service platform men, naturally those most virile and vigorous. The men who remained were loyal but, by virtue of their age, less aggressive. New recruits were secured, but many were irresponsible and transient; the annual turnover reached 200 per cent or more. The new men were naturally not acquainted with the traditions of the company and included some agitators. Together they overwhelmed the veterans; they secured the backing of the National War Labor Board in unionizing the property and there was a short strike.

But that was nearly three years ago and largely the outcome of conditions brought about by the war. The time intervening since the signing of the armistice has been employed by men and managers in developing a mutual understanding. The older men held the leadership in the union from the start, but for a time they were outvoted by the newcomers, who had no conception of the job of railroading. Gradually the more experienced men came into their rightful control and the newcomers settled down really to learning the business.

In the meantime the jitney menace became a reality. The men came to realize that their occupation, the duties of which they like and the stability of which they appreciate, was threatened by this competition. This conviction plus the gradual restoration of normal working conditions on the property impelled the recent action. And the other employees of the company have shown the same spirit. The shopmen voluntarily reduced their piecework rates some weeks ago and the supervisors added an hour to their day's work without compulsion.

The crux of this whole matter of intra-company relations is a mutual spirit of sympathy. Companies as such cannot be sympathetic, but managers and men can. It is only by honest regard by each for the other's welfare that collective bargaining can succeed. Before the war Public Service was a property where informal bargaining was the means of settling impending disagreements.

Superintendents and managers were in close touch with the men and appreciated their point of view. Such relations take time for development; as was previously explained, the war completely upset them in this case. They are now happily being restored, and the union local is taking a lot of the responsibility for restoring them.

Chicago's $180,000 Traction Report a Political Document

ANOTHER commission report on Chicago's local transportation problem is a matter of history. For an expenditure of $180,000, the people of Chicago have received a fifty-page report which assures his Honor the Mayor that his plan for "people's ownership and 5-cent fares" is not only feasible and practical but necessary as the only solution of the tangle, and contains a draft of the enabling legislation necessary before people's ownership can be had. The writing of this proposed law probably would require two or three days' time of an able lawyer, but aside from that the report as presented to the City Council could have been written with equal value in a half day's time by any good newspaper reporter who knew the Mayor's wishes and was willing to give him *carte blanche*. True, an engineering staff was organized and it accumulated a great mass of information, plans and data, but its value is doubtful, for the commissioners decided (after spending a good portion of the $180,000 total for engineering expense) that they would omit from their report "this non-essential mass of detail." And in another place the report informs the reader that the commissioners "have borne in mind that the building of a new system of transportation . . . will of necessity be an evolution in practice rather than a theoretical creation," and furthermore that "it will be for the trustees [of the proposed Transportation District] to determine what is the best at that time and to build their system accordingly."

Having thus disposed of the work done by the large engineering staff as of no consequence now and of no value in future to the new trustees, who must be left free to work out their own system, the earlier statement that the report could have been written in a few hours and for a few dollars is explained.

While the commission seems very ready to tell the Mayor that a 5-cent fare will pay operating expenses and all charges, the proposed act gives the Transportation District power to levy taxes to pay interest and maturities on bonds and any deficit between earnings and operating expenses. The assistant office boy in the Mayor's outer office could have told the Mayor that he can have 5-cent fares if he will pay the deficit out of taxes, and it wouldn't cost $180,000 to get this information. Other interesting provisions of the proposed act are that all property, real and personal, of the district would be free from taxation and that the acts of the trustees shall not be subject to review by any agency of the State government. Of course the elimination of taxes, which amount now to 0.256 cent for each fare collected, would help a very little toward the 5-cent fare, but the same little scheme would deprive the city of the tax income from one of its largest contributors. But even with taxes removed and the other vast economies which the commission's engineer suggests, we wonder if the people will not understand that the plan must mean a considerable jump in taxes, not only to make up the tax income lost from the traction properties, but to make up the deficit in cost of a ride above 5 cents, when it is known that wages and materials alone now cost 5.78 cents per passenger carried.

Nevertheless the new Governor of Illinois, true to his election pledges, has recommended in his inaugural address that the State Public Utilities Commission be abolished, that the enabling legislation for Mayor Thompson's plan be passed and that "home rule" be reverted to in all cities. It remains to be seen if the success of the Thompson machine can be made to include control of the State legislature.

Service Below Cost Is Injurious to City in Long Run

MOST cities in this country have reached the conclusion that one of the essential factors in civic prosperity and the comfort of the public is a transportation system which is in good operating and financial condition. Unfortunately for the city of New York, it is not one of these, and the facts in the case do not seem to be understood even by all those who should realize them. The two arguments against an increase in fare most frequently heard in New York are, first, that prices are now falling and the present fare will be adequate before long if not now. The second is that the present fare is specified in the franchise of certain companies, notably the rapid transit companies, and "a contract is a contract" and should be lived up to by the companies.

President Hedley of the Interborough Rapid Transit Company effectually disposes of both of these arguments in a letter recently addressed to the New York *Tribune*, to which these arguments seemed to appeal. This reply points out, in regard to the first point, that there is no immediate opportunity for the company to make any material reduction in either wages, which amount to more than 67 per cent of the company's expenses, or in the cost of coal, which accounts for 15 per cent of the expenses. As to the second point, the fact is clearly brought out that the existing crisis in transportation affairs is clearly one in which the city is or should be as keenly concerned as the company. This is true not only because the city has $250,000,000 invested in the present subways, but it needs now and will need still more in the early future increased rapid transit facilities. Based then purely on the ground of self-interest, the city is or ought to be anxious to have its local transportation system conducted on a business basis, and by solvent companies. The announcement by the company that it will accept a flexible fare based on the cost of service ought to make relief by the city easy.

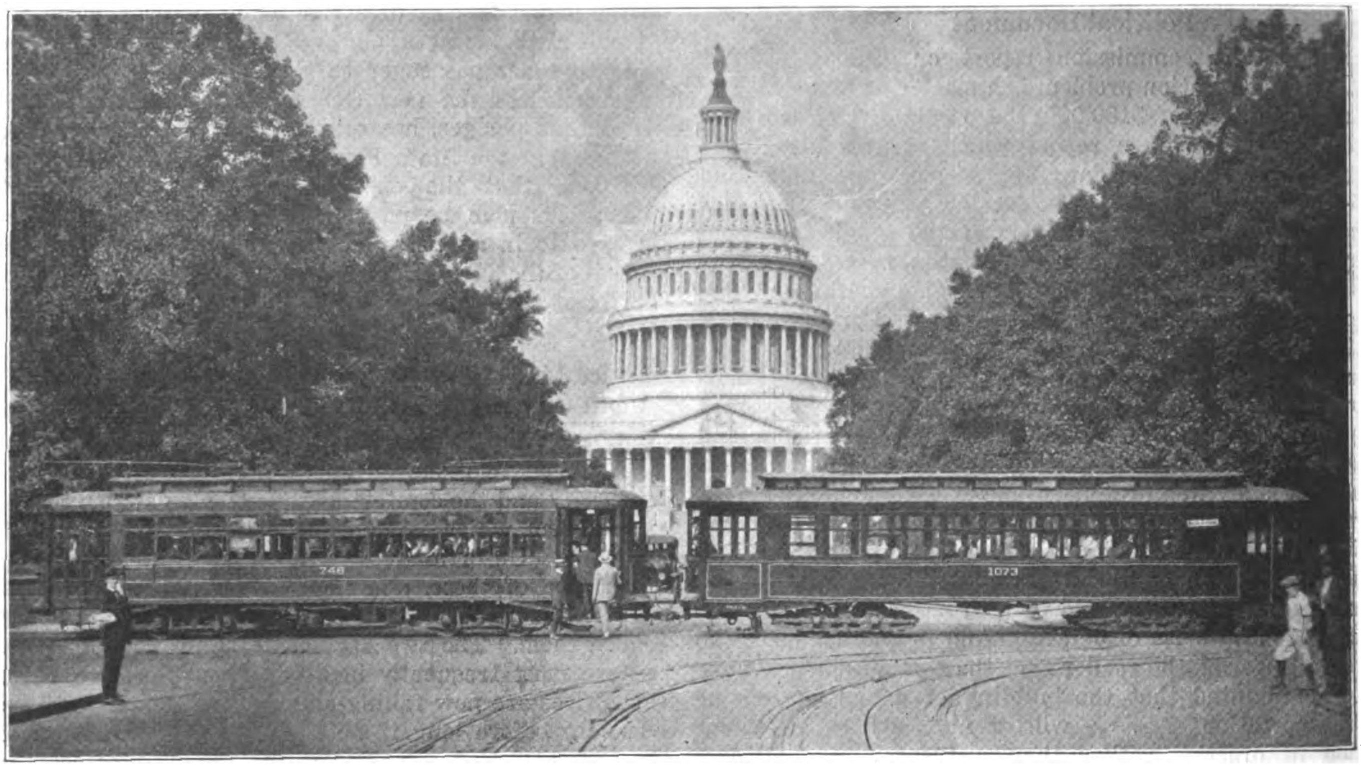
Quotation from the Federal Electric Railways Commission Report

No. 4

THE necessity for scientific and successful regulation of systems, whether large or small, and especially those which operate through several cities and villages and in rural territory, leads to the conclusion that local regulation should generally be subject to the superior authority of the state, whether as a matter of original jurisdiction or through the medium of appeal.

Two-Car Trains in Washington

Old Open Cars Are Being Converted Into Trailers for Train Operation—Extensive Power Consumption Studies Indicate a Low Cost of Trailer Operation—To Adapt Two-Car Train to Operate on Stub-End Lines, Trailer Is Equipped with Controller and Plow—Fifty Trailers Now Being Converted for This Purpose



NEWLY CONSTRUCTED TRAILER COUPLED TO MOTOR CAR IN OPERATION

WITH a view to taking advantage of any economies of operation which might accrue from two-car train operation, the Washington Railway & Electric Company is now converting some fifty old open car bodies into closed cars for use as trailers. Before the reconstruction program had progressed very far full studies were made of the comparative power consumption of operating a motor car alone and a motor car with trailer to see what economies actually would be realized.

The reconstruction job is proving extremely satisfactory. Four of the cars have been converted at the present time and are now being used as trailers. The construction has been so arranged, however, that these converted cars can be used as motor cars when necessary equipment has been added. The original equipment of these open cars was removed a few years ago and transferred to closed cars during the winter season, for when these cars were used in service the company did not have a complete equipment for both summer and winter operation and was in the habit of exchanging equipment between cars. These open cars have not, therefore, been in service for several years.

In the reconstruction work the car bodies are stripped of seats, steps, grab handles, vestibule hoods and dashes. The center sills are cut back to the bulkhead posts and the side sills are cut off at the corner posts. New end sills reinforced by steel plates are mortised in and tiebars are installed to distribute the drawbar strains and add strength to the corners of the body. The side sill is further strengthened by an overtruss, which extends at each end through the steel side sill and is supported by two queen posts, which rest on the ends of bolsters.

In order to provide for side sash and to support the letterboard the lower portion of the side sills where the old seat ends were fastened is filled up with a yellow pine furring strip. On the outside of the post a false post 1½ in. thick, also of yellow pine, is bolted so as to extend up over the old letterboard. This post is cut to receive an ash beltrail, the posts extending over the letterboard form pockets, into which the side sash can be raised. The new letterboard is fastened to the upper portion of the post and the lower deck is extended out to meet it. The whole is covered with No. 8 duck. The old car bodies had a stationary seat at each end and there was a wide opening at these points. In order to make all sash the same size an extra post is installed and the narrow space which is left is paneled with sheet steel. The new platforms are of different lengths and the contour of the car body roof has been changed, so it is not possible to use the old hood.

A new car floor was laid over the old one under the seats, and in the center aisle maple floor strips were screwed to the old floor. New maple flooring was installed in the vestibules, with Mason safety treads on the steps and end sill.

The car has two door openings at diagonally opposite corners. Each opening is equipped with double folding doors and folding steps operated by pneumatic door engines mounted overhead. In operation the leading

end is used for both entrance and exit. The reconstructed cars have a seating capacity of forty-four. The cars are equipped with Heywood Brothers & Wakefield seats, Holden & White-Cutler-Hammer type car heaters, O. M. Edwards sash locks, Brill ventilator openers, Brill vertical wheel hand brakes with Peacock drums, Electric Service Supply Company's light fixtures with opalescent shades, Pantasote curtains, Tomlinson couplers with air connection, Westinghouse Traction Brake Company's type S. M. E. air equipment and National Pneumatic motorman's signal door lights and conductor's single stroke bell.

The car body is painted on the outside with the company's standard green with aluminum stripes and letters and the inside in cherry. The headlining is of agasote.

This reconstruction work is being done in the shops of the company under the direct supervision of R. D. Voshall, master mechanic.

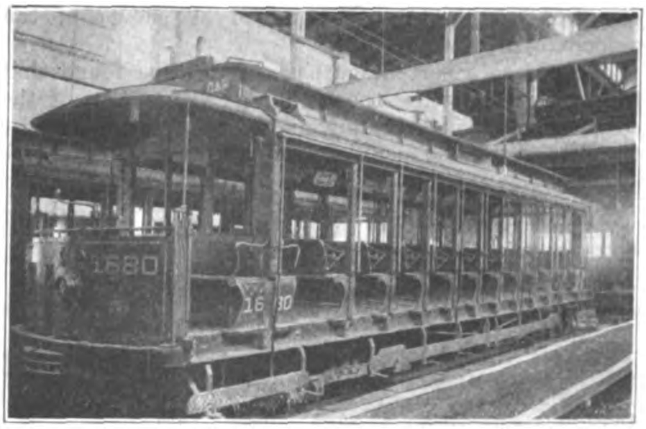
One of these reconstructed cars, No. 1071, ready to use as a trailer, was used with motor car No. 749 as a train. The motor car was equipped with an Economy electric meter and the power consumption measured for each trip both with trailer and without, the motor car or train, as the case may have been, being operated in regular service.

Previous to June 29, 1920, the train was operated on a schedule calling for two morning and two afternoon trips, arranged as follows:

Leave East Capitol barn,	7:28 a.m.	Leave Fourteenth and F,	7:49 a.m.
Leave East Capitol barn,	8:17 a.m.	Leave Fourteenth and F,	8:37 a.m.
Leave East Capitol barn,	2:44 p.m.	Leave Georgetown,	3:25 p.m.
Leave East Capitol barn,	4:28 p.m.	Leave Georgetown,	5:11 p.m.
Saturday:			
Leave East Capitol barn,	7:28 a.m.	Leave Fourteenth and F,	7:49 a.m.
Leave East Capitol barn,	8:17 a.m.	Leave Fourteenth and F,	8:37 a.m.
Leave East Capitol barn,	1:02 p.m.	Leave Georgetown,	1:46 p.m

Beginning June 30 a new schedule was put into effect, as follows:

Leave East Capitol barn,	7:48 a.m.	Leave Georgetown,	8:30 a.m.
Leave East Capitol barn,	3:36 p.m.	Leave Georgetown,	4:20 p.m.
Leave East Capitol barn,	5:16 p.m.	Leave Georgetown,	6:00 p.m.
Saturday:			
Leave East Capitol barn,	7:48 a.m.	Leave Georgetown,	8:30 a.m.
Leave East Capitol barn,	1:05 p.m.	Leave Georgetown,	1:46 p.m.



OLD OPEN FIFTEEN-BENCH CAR

Beginning July 15 a new schedule was put into effect, as follows:

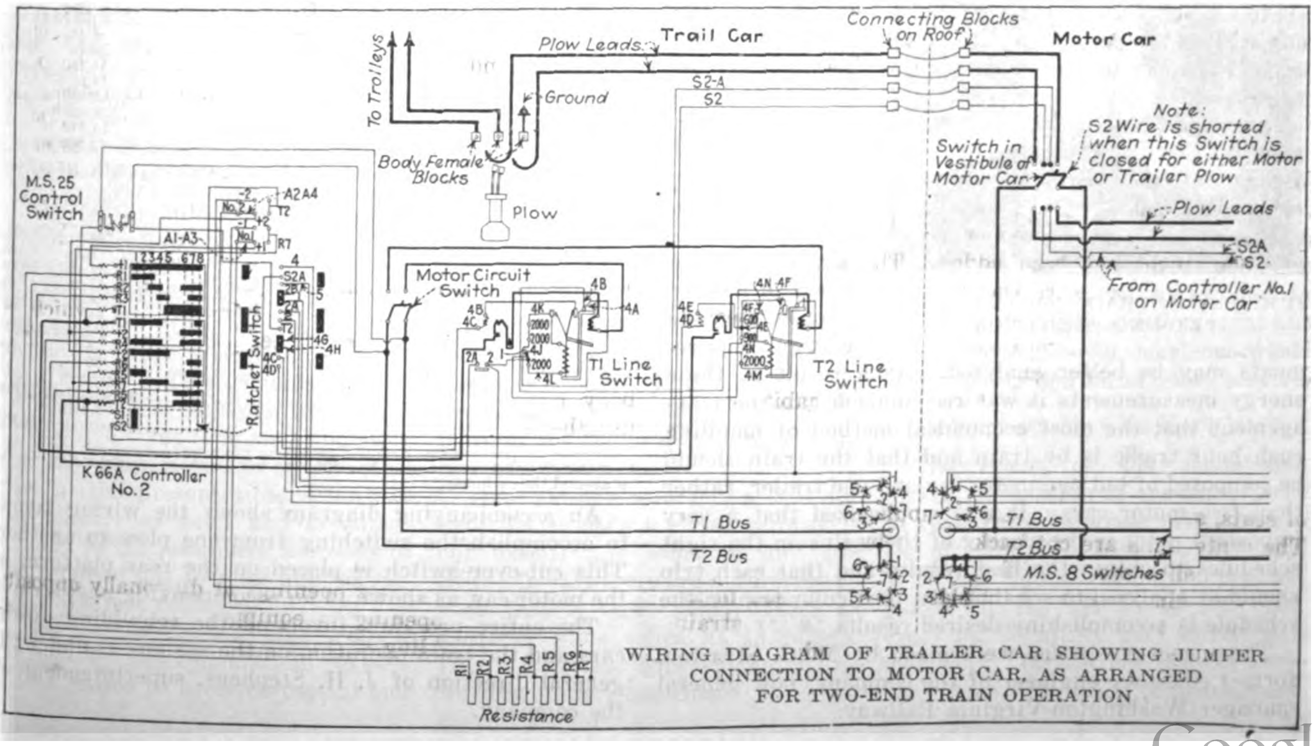
Leave East Capitol barn,	7:40 a.m.	Leave Georgetown,	8:23 a.m.
Leave East Capitol barn,	3:11 p.m.	Leave Georgetown,	3:52 p.m.
Leave East Capitol barn,	4:52 p.m.	Leave Georgetown,	5:40 p.m.
Saturday:			
Leave East Capitol barn,	7:40 a.m.	Leave Georgetown,	8:23 a.m
Leave East Capitol barn,	12:22 p.m.	Leave Georgetown,	1:04 p.m

The train does not run Sundays or holidays.

From the manifests for the dates corresponding to the days on which energy measurements were made the number of passengers carried and the cash value of receipts were calculated for each trip and each day. The number of platform-hours with the corresponding cash value was also computed for each trip and day.

The cost of power consumption in the following analysis was based on a unit price of $.00666 per kilowatt-hour.* From costs of maintenance of equipment of motor cars and trailers, taken from company records, a ratio of maintenance of trailers to motor cars of 25 per cent was used. The cost of maintenance of equipment of motor cars was figured at $0.0475 per car-mile.

From the power measurements and the calculations based on the figures given, the analysis of power con-


Trail Car
Motor Car
Connecting Blocks on Roof
Plow Leads
To Trolleys
Ground
S2-A
S2
Body Female Blocks
Plow
Note: S2 Wire is shorted when this Switch is closed for either Motor or Trailer Plow
Switch in Vestibule of Motor Car
Plow Leads
S2A
S2
From Controller No.1 on Motor Car
M.S. 25 Control Switch
A1-A3
A2 A4
No.2
No.1
T2
R7
12345 678
S2A
2B
2A
T2
4G
4H
4C
4D
5
4
Ratchet Switch
Motor Circuit Switch
4B
4C
4K
4J
4L
2A
2000
4A
T1 Line Switch
4N 4F
4E
4D
4M
T2 Line Switch
K66A Controller No. 2
T1 Bus
T2 Bus
M.S. 8 Switches
R1 R2 R3 R4 R5 R6 R7
Resistance

WIRING DIAGRAM OF TRAILER CAR SHOWING JUMPER CONNECTION TO MOTOR CAR, AS ARRANGED FOR TWO-END TRAIN OPERATION sumption and costs was obtained as shown in the accompanying table.

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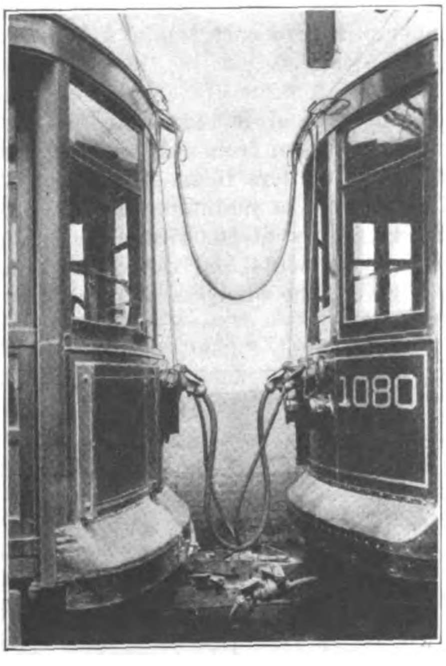
*The present cost is more nearly $.008 per kilowatt-hour.

Reduced to a percentage basis, it is thus found that the cost of operating the trailer is 42 per cent of the cost of operating the motor, and of the total cost of the train operation 30 per cent only is chargeable to the trailer. These figures bring the cost of transportation by trailer approximately equal to that of a light one-man safety car.

Kilowatt-hour per car-mile:						
Morning trip	motor	4.65	trailer	0.95	train	5.60
Afternoon trips	motor	3.50	trailer	1.15	train	4.65
Platform expense per car-mile operated:						
Morning trip	motor	$0.184	trailer	$0.092	train	$0.276
Afternoon trip	motor	.20	trailer	.10	train	.30
Maintenance of equipment expense per mile operated:						
Morning trip	motor	$0.0475	trailer	$0.012	train	$0.0595
Afternoon trip	motor	.0475	trailer	.012	train	.0595
Cost of the trips as operated, divided into:						
Power—Morning	motor	$0.38	trailer	$0.08	train	$0.46
Afternoon	motor	.29	trailer	.09	train	.38
Platform—Morning	motor	2.25	trailer	1.13	train	3.38
Afternoon	motor	2.43	trailer	1.22	train	3.65
Equipment—Morning	motor	.58	trailer	.15	train	.73
Afternoon	motor	.58	trailer	.15	train	.73
Total cost of operation:						
Morning trips	motor	$3.21	trailer	$1.36	train	$4.57
Afternoon trips	motor	3.30	trailer	1.46	train	4.76

The cost per car-mile of maintenance of way and structures and general overhead expense was not considered in the analysis, as these figures would not be affected by the operation of a limited number of trains.

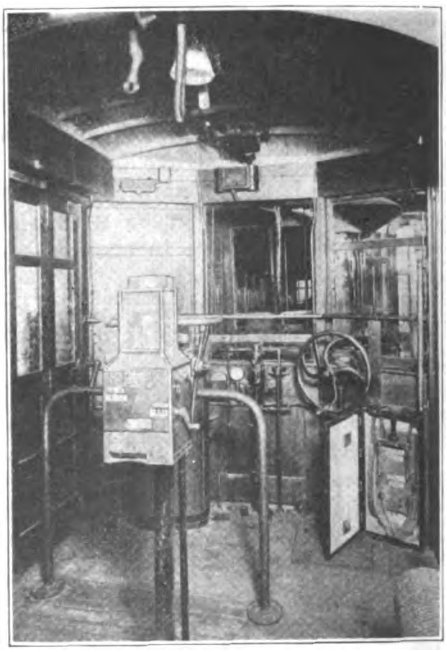
An analysis was also made of revenue by trips and by days and also the number of passengers carried, and from this it was found that some of the trips prior to June 30 were not earning operating expenses, but that after the change in schedule on June 30 the train was much better placed with regard to traffic and made a better showing on the relation of revenue to operating expense. Specifications of the motor car and trailer, as to weight and dimensions, are given in a table in order that the energy requirements may be better analyzed. As a result of these energy measurements it was recommended to the management that the most economical method of handling rush hour traffic is by train and that the train should be composed of but one motor car and one trailer, rather than two motor cars. It was emphasized that a very important point is the placing of the trains on the right schedules to obtain the best results and that each trip should be analyzed to see that that particular trip on the schedule is accomplishing desired results.



JUMPERS ON TRAIN ARRANGED FOR TWO-END OPERATION

These energy studies were made by M. G. Stratton, former efficiency engineer of the company, now general manager Washington-Virginia Railway.

There were also some lines of the company on which the operation of a two-car train seemed justified, from the traffic standpoint, but which were stub end and therefore not conveniently arranged for train operation. It occurred to some of those interested in the studies that the trailer might be equipped with a controller and plow so that the train could be operated from either end. This equipment has been placed on one of the trains and this train has been under operation for the purpose of making a study as to its practicability or desirability. It was found necessary to equip the trailer with a plow rather than to use the plow of the motor car on account of the obvious difficulties which would otherwise be encountered in the operation of electric track switches. This also made necessary an arrangement for switching from one plow to the other, depending on which controller was to be used.



VIEW SHOWING LOCATION OF SWITCH TO CUT FROM ONE PLOW TO THE OTHER

SPECIFICATIONS OF MOTOR CAR NO. 749, PAY WITHIN, KUHLMAN CAR COMPANY

Over-all length	43 ft. 11½ in.
Width	8 ft. 7½ in.
Height	11 ft. 11½ in.
Inside length	42 ft.
Inside height	8 ft. ½ in.
Seating capacity	48
Motor equipment	4 G.E., 200 K motors
Control equipment	K 66 A
Truck	Brill 76 E
Wheelbase	4 ft. 10 in.
Truck centers	20 ft. 2½ in.
Wheel diameter	31 in.
Gear ratio	14 to 67
Weight of two trucks	12,300 lb.
Weight of four motors	8,960 lb.
Weight of car body	24,540 lb.
Total weight	45,800 lb.

SPECIFICATIONS OF TRAILER NO. 1,071, PAY WITHIN, RECONSTRUCTED FROM NARRAGANSETT TYPE FIFTEEN-BENCH OPEN CAR

Over-all length	44 ft. 1 in.
Width	8 ft. 4 in.
Height	11 ft. 6½ in.
Inside length	42 ft. 4 in.
Inside height	8 ft. 2 in.
Seating capacity	44
Truck	Peckham 14B3
Wheelbase	4 ft. 6 in.
Wheel diameter	30 in.
Weight of two trucks	12,000
Weight car body	Approximately 22,000
Weight of one motor*	2,850
Total weight	Approximately 36,850

* One Westinghouse motor No. 306 was left on these open cars for moving it around the carhouse.

An accompanying diagram shows the wiring layout to accomplish the switching from one plow to another. This cut-over switch is placed on the rear platform of the motor car, as shown in an accompanying photograph.

The entire program, involving the rebuilding of the cars and the train operation on the system, is under the general direction of J. H. Stephens, superintendent of the company.

This Is the First of a Series of Articles on the Report of the Federal Electric Railways Commission, Written by a Commissioner

Underlying Principles of Public Service

This Is Best Obtained Under the Service-at-Cost Plan, Whose Natural Result Is to Establish Co-operation and Remove Antagonism Between the City and Operating Company—It Also Permits Utilities Safely to Become Monopolies and Reduces the Reasons for Labor Difficulties, Thus Making Continuous Service More Certain

BY EDWIN F. SWEET
Assistant Secretary Department of Commerce, Washington, D. C., and Member Federal Electric Railways Commission

EDWIN F. SWEET

THE investigation of the street railway situation made by the Federal Electric Railways Commission brought out many interesting facts concerning the industry and its relations to the public.

The commission was composed of eight men of divergent interests, and the fact that they were able to reach a unanimous agreement after considering testimony covering more than 6,000 pages of typewritten matter is not only noteworthy in itself but is gratifying evidence of their own fair-mindedness and the probable correctness of their conclusions.

Their report, covering about thirty pages of ordinary book size, can be read in an hour. Any one can obtain a copy of it at nominal cost by addressing a letter to the Superintendent of Documents, Government Printing Office, Washington, D. C. It is to be hoped that the desire expressed by the President for its wide circulation may be fully realized.

PUBLIC SERVICE—NOT PRIVATE PROFIT—THE AIM

The features of the investigation which impressed me as the most important are, first, that the principle underlying the street railway industry and all other public utilities should be public service and not private profit. This sounds like a truism. Almost any one would say, "Of course," yet it is an astounding fact that heretofore and for the most part at the present time service to the public has been and is subordinated to the pecuniary interests of the corporations owning and operating the street railways.

The service-at-cost plan recommended by the commission permits a fair return to invested capital and just compensation to labor, but provides for public regulation and stresses the point that the primary purpose is to serve the public.

The second feature of the committee's report which impresses me is the absurdity of the uniform 5-cent franchise or any other fixed fare which takes no account of the varying costs of labor and material or the changing financial conditions affecting credits and the acquisition of funds for extensions and improvements. Manifestly no industry can thrive without freedom to adjust the price of the commodity it sells to the cost of production.

The evidence also shows that the cost of operating a street railway is not exactly the same in any two cities; in fact there are differences so wide that it costs nearly twice as much in some cities as in others. This is a further impeachment of the universal 5-cent franchise.

The establishment of co-operation and the removal of antagonism between the city and the operating company, bred by the obsolete private profit plan, seem to me of especial importance and to be the natural outgrowth of the service-at-cost method of operating street railways in the public interest.

Another point of importance which has apparently escaped observation in the past is the fact that paving between the tracks and all other burdens imposed upon the street railway companies can only be paid for out of the fares received from car riders, and in the final analysis, under proper public regulation, these burdens are borne by the car rider while the general public and especially automobile riders are the chief beneficiaries. Broadly speaking, it is a tax upon the poor for the benefit of the rich and ignores the plain principle that sound public policy demands the efficient operation of street railways at the lowest possible cost to those who cannot afford conveyances of their own and must depend upon the street cars to get from place to place.

Another feature of the report which deserves especial attention is the importance of the square deal to labor, not only because it is right but because it makes for courteous treatment, safety and satisfactory service.

MONOPOLIES MAY BE MADE SAFE

The report of the commission makes no mention of the importance of restricting the street railway service of a city to a single company. With the public regulation contemplated in the service-at-cost plan, every public utility may safely be a monopoly. One street railway company, one telephone company, one lighting company and a single water supply can render better service at less cost than two or more competing companies. Testimony respecting the city of Washington clearly demonstrated this fact. One of the Washington companies appeared to be doing very well on a 5-cent fare, the other urged and probably needed an increase. This presented a practical difficulty which was solved by granting an increase to both. One of the chief reasons given for the financial straits of the less prosperous company was the extension of its lines into unprofitable suburban territory.

This brought to the attention of the commission the fact that in many cities the car rider is penalized by having to pay a somewhat higher fare because of non-paying extensions made at the instance of comparatively few suburbanites or speculators in real estate, and in all such cases it is the opinion of the commission that the expense should be borne by those who profit by it in proportion to the benefits received and not added to the valuation of the property upon which a return is to be allowed, which must come out of the pockets of car riders.

SERVICE SHOULD BE CONTINUOUS

The last point in the report of the commission to which I call attention as especially important is the opinion expressed with regard to strikes and lockouts.

It is of vital importance to the entire community that street railway service should be continuous. As the report puts it, "It is intolerable that the transportation service of a city should be subject to occasional paralysis." If labor disputes cannot be settled by conferences between the managers of the street railway company and the employees, there should be resort to arbitration, and the decision of the arbitrators should be final and binding upon both of these parties.

This recognizes the principle that the primary purpose of street railways is not to afford opportunity for the investment of capital and not to provide work for employees, but for the benefit of the public, whose interest is paramount.

President Gadsden Sounds Optimistic Note

In a Statement Issued to the Daily Press, Association President Shows that the Electric Railway Industry Is Making Steady Approach to a Stable Basis—Shows that the Public, Both Car Riders and Official Regulatory Commissions, Are Taking Real Interest in Rehabilitation

RIGHT in line with the statistical information given, and the general trend and outlook of the industry interpreted and portrayed in the Jan. 1 issue of the ELECTRIC RAILWAY JOURNAL, President Gadsden of the American Electric Railway Association has just issued, for publication in the daily press, an official statement of the national condition of the Electric Railway industry, which shows the industry to be returning to stable conditions. This word of optimism coming from the leading figure in the electric railway field today is an encouraging sign.

His statement follows:

PHILIP H. GADSDEN

An official report on the national condition of the electric railway industry for the year ending January 1, 1921, just compiled by the American Electric Railway Association indicates a gradual and steady approach to a stable basis.

This situation is largely due to the fact that regulatory bodies, recognizing that granting of the claims of electric railways for fair rates of return is essential to the maintenance of good service, have steadily ordered relief throughout the country.

These regulatory bodies also seem to be cognizant of the fact that rehabilitation of lines will be a slow process and that at least the present advanced rates must be maintained for some time even if falling costs, anticipated but not realized as yet, should come. A large majority of the companies in the last four years have strained their financial resources to the limit, or created actual deficits, by merely meeting current expenses and making absolutely unavoidable emergency improvements. Many badly needed improvements have been deferred by virtually every company on account of a lack of funds. It is necessary, therefore, now that fares are beginning to be commensurate with costs, that the present increased rates be continued until lines are fully rehabilitated. Unless present fares are maintained, indefinite suspension of extensions and betterments will result, and this would be almost fatal to many properties.

The report just completed shows that 548 cities in the United States, representing more than 90 per cent of the riding public, are paying fares ranging from 5 cents with a 1 cent transfer charge to a flat rate of 10 cents.

The largest groups are: Cities paying a 10 cent fare, 112; 8 cent fare, 6; 7 cent fare, 174; and 6 cent fare, 124.

Other groups follow: Cities paying a 9 cent cash fare, 6; 7 cent fare, 1 cent transfer, 26; 7 cent zone fare, 8; 6 cent city and outside zone fare with 2 cent transfer charge, 10; 6 cent zones, 5; two 5 cent zones, 2; 5 cent city zone, 5 cent outside, 10; 5 cent city zone, 1 cent charge for rides outside city zone, 1; 5 cent fare, with additional charge for transfers, 4.

The immediate result of the widespread inclination to adjust rates upward to the requirements of good service is found in the low number of electric railway receiverships for the year 1920.

There were only 16, representing a total capital stock of $25,313,655, as compared with 48 receiverships, representing a capital stock of $221,259,354, in 1919. During the year 450 miles of track were dismantled and 308 miles of track abandoned.

Another encouraging sign is found in the general public interest in the welfare of electric railways. From every part of the United States reports have reached the association that not only are regulatory bodies but car riders generally taking the greatest interest in the restoration of companies to a healthy state. In practically every community there appears to be a desire on the part of the car riders to cooperate in an effort to make the lines self-sustaining and to encourage a flow of new money into the industry. Certainly the inclination to prevent companies from receiving sufficient return to maintain good service is confined to a small number of persons.

A.I.E.E. and W.S.E. Discuss Safety Cars

Three-Truck Trains Constructed in Milwaukee from Old Equipment Were Described and Their Advantages and Disadvantages Pointed Out—Results of Safety Car Operation in Waukegan, Ill., Shown to Be Very Gratifying —Automatic Substations Briefly Treated

AT A joint meeting of the Chicago Section, American Institute of Electrical Engineers, and the electrical section of the Western Society of Engineers in Chicago on Dec. 17 more than two hundred were present to hear a program on "Present Tendencies in Electric Railway Development and Available Means for Improvement." Papers were presented on the development of the design and use of the safety car by Harry L. Brown, on the results of safety car operation on the Waukegan city lines of the Chicago, North Shore & Milwaukee Railroad by H. A. Johnson, on train operation on urban railways by S. B. Way and on automatic railway substations by Charles H. Jones. Lieut.-Col. E. J. Blair, assistant to the president Chicago Elevated Railways, was chairman of the meeting.

All four papers were read and then simultaneously discussed. The paper by Mr. Way was published in abstract last week. The others appear elsewhere in this issue. In introducing the discussion, Colonel Blair commented that after hearing these papers it must be evident to those present that the electric railway managements have been very active in devising ways and means to cope with the ever-increasing operating costs.

MR. ADAMS DESCRIBES MODIFIED CAR

H. H. Adams, superintendent of equipment Chicago Surface Lines, in discussing the safety car papers, spoke briefly of the consideration being given to the use of safety cars on certain semi-congested lines in Chicago. He made the point that for such service it seemed highly desirable that there should be a separate exit and entrance for passengers, in order to avoid the necessity to make boarding passengers wait until all leaving passengers have got off the car. He said that a detailed study is now being made looking toward the development of a safety car for Chicago having this feature and a little more generous dimensioning in other respects, without materially increasing the weight of the standard car. From the present state of the study he said it appeared that a design of car could be built with a 24½-in. aisle instead of 21¼ in., a seat width of 35 in. instead of 34½ in., an over-all width of 8 ft. instead of 7 ft. 8 in., an over-all length 16 in. greater than the standard car, and a seating capacity of thirty-six instead of thirty-two, without having the weight exceed 17,000 lb. This would give a weight of 472 lb. per seat as compared with 519 lb. per seat on the present standard double-end car, or a reduction of nearly 10 per cent. It is also planned to install some kind of barrier to prevent passengers from entering on the exit side for the purpose of evading payment of fare.

Mr. Adams also commented on the reference in Mr. Brown's paper to the saving in first cost to purchasers of safety cars resulting from their standardization. He said that he had not seen a great deal of evidence of this saving. He pointed out that the standard safety car weighing 16,600 lb. and bought for $7,300 was a cost of 44 cents per pound. The new double-truck cars which the Chicago companies are about to purchase will weigh 46,000 lb. and cost $15,000, or a cost per pound of 32.6 cents, a difference in the favor of the non-standard double-truck car of 11.4 cents per pound.

Referring to the plan to use trailers in Chicago, Mr. Adams said that within six months it is probable there will be available fifty new motor cars equipped for hauling the fifty trailers now under construction in the company's shops. He said that one of the great advantages of train operation is that it requires only 20 per cent more time for a two-car train to pass an intersection than it does for a single-car unit with one-half the capacity.

AUTOMATIC SUBSTATIONS CONSIDERED

Col. Bion J. Arnold reviewed briefly the history of the development of the automatic substation as it was worked out in the original installation on the Elgin & Belvidere Electric Railway, which he owns. This discussion was given in connection with the paper on automatic substations read by Mr. Jones.

A great deal of interest was manifest in the three-truck train discussed by Mr. Way. His description of this unique equipment and pictures of the train appeared in last week's issue of this paper.

THE FIELDS OF TRAINS AND SAFETY CARS ARE COMPARED

Wray T. Thorne said that the development of modern couplers and cars provided with doors closing up all openings while the cars are in motion eliminate the early objections to trailers. The economies of train operation in dealing with mass transportation are now available and where the traffic density warrants, and other operating conditions are favorable, service can be given at less expense than formerly, or much improved service can be rendered at relatively small increase in operating cost.

In the safety car we have a new transportation tool, but as in tooling a plant, a study and analysis of the conditions are necessary to insure a successful application. Where this elementary precaution has been most carefully observed these cars seem to have been the most successful.

It is evident that there are service conditions where such cars will not meet the requirements. Such, for example, are streets or routes whereon the headway with cars of large carrying capacity is now so close as adversely to affect schedule possibilities.

The one-man safety car apparently has demonstrated to many operators the old transportation law that frequency of service stimulates traffic. Most operators, however, have known of this law for years, but the cost of providing such additional service with available equipment has been prohibitory.

Results of Safety Car Operation in Waukegan, Ill.*

By H. A. Johnson
Organization Engineer Chicago, North Shore & Milwaukee Railroad, Chicago

THE rapid growth in the popularity and use of safety cars is due, in my judgment, to the fact that railway properties operating under certain conditions have been able to make a substantial saving in operating expenses and at the same time give more frequent service. The more frequent service has attracted new business which the railway company did not previously enjoy.

The saving in operating expenses has been chiefly due to, first, a large reduction in platform expense due to this car being operated by one man instead of two men; second, a considerable reduction in the amount of power required to operate this car on account of its light weight, and, third, a reduction in the cost of maintenance.

While the foregoing statements apply in a general way to the operation of light-weight safety cars, it is impossible to work out any formula or standard set of conditions which will apply generally. Because safety cars have been a success on one property does not mean that every street railway should replace its present equipment with them. To determine whether this type of car would be economical and serviceable requires a detailed study of the operating conditions on the particular property. Accordingly I will confine myself to a discussion of the results of installing one-man safety cars on the Waukegan city lines of the property with which I am connected, rather than try to discuss the economic aspects in a general way.

These lines furnish the street car service for the adjacent communities of Waukegan, North Chicago and Great Lakes Naval Training Station. The city of Waukegan lies approximately 38 miles north of Chicago, extends along the west shore of Lake Michigan and has a population of 20,000. The town of North Chicago adjoins Waukegan on the south and has a population of about 5,000. The Great Lakes Naval Training Station, located on the shore of Lake Michigan, adjoins North Chicago on the south. During the war there were as many as 45,000 men in training at this station, but at the present time this number has been reduced to approximately 10,000.

The Waukegan city line is composed of two branches: One branch, which we shall call the North and South Line, extends north from the Great Lakes Naval Training Station through the town of North Chicago to the center of the city of Waukegan, a distance of 3.65 miles, and then continues north to the north city limits of Waukegan, an additional distance of 1.62 miles, making a total length of 5.27 miles. The other branch, which we may call the East and West Line, connects with the North and South Line at the center of the city of Waukegan and runs straight west to the west city limits, a distance of 1.03 miles.

The traffic on this local system is very similar to the traffic in larger cities in that there are heavy rush-hour periods night and morning, with comparatively light traffic outside of these hours. This is occasioned by the comparatively large number of industries depending upon these lines for transportation of their employees. There are nine of these factories, each employing 100 or more men. Two employ 1,000 men each, one employs 500 men, one employs 250 men, two employ 200 men each, one employs 150 men and two employ 100 men each.

During the year 1919 the service was performed by double-truck cars operated by two men and weighing approximately 25 tons each. These cars have a seating capacity of fifty, are 48 ft. long over all, equipped with four motors and multiple-unit control. On the North and South Line, cars were operated on a fifteen-minute headway, both during the rush hours and during the non-rush hours. During the rush hours, however, a second car was added, making a two-car train. On the East and West Line one car was operated during non-rush hours, making a round trip every twenty minutes. During the rush hours another car was added so that the interval was reduced to ten minutes.

TEN SAFETIES PUT IN SERVICE

In February of 1920 ten light-weight safety cars were put in service on the North and South Line. They are the standard safety car with certain modifications in construction and with certain additions in the nature of added insulation and heating equipment on account of the cold climate in this part of the country. They weigh 8½ tons.

The safety cars were put in service on the North and South line, which serves the industries and carries most of the traffic. They take care of the basic schedule and are supplemented during the rush hours by part of the old double-truck cars. The East and West Line is still operated with the double-truck cars. Before the safety cars were put in service the city authorities and the public were carefully prepared for the change by publicity work which included moving pictures in the theaters and there has been no criticism of the cars or their operation since the day they began to run. In fact, just the opposite is true. The public seems to like the safety cars better than the old double-truck cars because they are new, of more cheerful appearance, and the step and platform arrangement permits of more comfortable and easier entrance and exit.

Coincident with the placing of the safety cars in operation the schedules were changed to provide more frequent service. The interval on the North and South Line was reduced from fifteen minutes to eight minutes during both rush hours and non-rush hours. On the East and West Line the interval was made ten minutes all day and evening in place of ten minutes for rush hours and twenty minutes for non-rush hours.

Immediately after the safety cars were placed in service and the schedules changed, the traffic, which had remained practically constant for a long time, increased very decidedly. This increase has been maintained up to the present time. The increase in traffic and more frequent service has resulted in an increase in the number of car-miles operated. During the eight months following the change 493,856 car-miles were operated as compared with 314,535 car-miles during the corresponding eight months of the previous year or an increase of 57 per cent. The operating revenue for the same period increased 42.52 per cent. The operating expenses increased 34.16 per cent. The operating expenses per car-mile, however, decreased 14.8 per cent. This decrease was effected in spite of a general increase in wages in all departments of approximately 20 per cent and the payment to safety car operators of 5 cents per hour more than the rate paid motormen and conductors on cars operated by two men.

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*Abstract of paper read before joint meeting of A. I. E. E. and W. S. E., Chicago, Dec. 17, 1920.

On the double-truck cars the platform expense is two men at 60 cents per hour or a total of $1.20 per hour, while on the safety car it is one man at 65 cents per hour, indicating a saving of 45.8 per cent in platform expense for every car-hour operated with safety cars. The double-truck car operating on the North and South Line consumes electric energy at an average rate of 2.90 kw.-hr. per car-mile for traction, while the safety car requires 1.07 kw.-hr. per car-mile, which is 63 per cent less than the energy used by the double-truck car.

After paying all operating expenses and taxes, the income from operation for the Waukegan city lines covering the period of eight months following the introduction of safety cars shows an increase of 342.39 per cent. The addition of the ten safety cars has, of course, increased the capital account and the annual interest charges. If the trainmen's wages during the period following the introduction of the safety cars had remained on the same level as during the corresponding period of the previous year, and if the amount of the additional interest on the investment in safety cars is charged against the operating revenue, the income from operation after introducing the safety cars would show an increase of 441 per cent for the same periods as previously considered.

The results described have been brought about by a partial change to light-weight safety cars. If a complete change had been made and all of the double-truck cars disposed of, the economies would have been greater. The public has been satisfied with the introduction of the safety cars because it has received more frequent service with clean, fast cars. The railway company has been satisfied because the passenger traffic has increased, the income from operation has materially increased, jitney competition has been eliminated and it has the satisfaction of giving better service to the communities served.

Advantages of Automatic Railway Substations*

By Charles H. Jones
Electrical Engineer Chicago, North Shore & Milwaukee Railroad, Chicago

INSTALLATIONS of automatic railway substations have been made on light and heavy interurban service, light city service, heavy trunk-line service through the Detroit Tunnel of the Michigan Central Railroad, and recently an installation has been made for the heavy city service at Cleveland, Ohio. This last installation will be watched with considerable interest by engineers on account of its being the first extensive application in this class of service. These installations have been on equipments varying in size from 300 to 2,000 kw. From the foregoing it is apparent that trials have been made in all classes of railway service, yet the development of this equipment is only in its infancy, and the extent to which it will be used is limited only by the economical results which can be obtained.

The advantages of automatic over manually operated substations are as follows:

1. Reduction in cost of substation operating labor. This benefit will be felt in every field of application of the equipment and is probably the greatest single saving that can be made.

2. Reduction in power loss due to elimination of idle running time. This saving will be of considerable value to the property on which the service is infrequent and where it is impractical to follow the load in a hand-operated station by shutting down and starting up the station frequently, which the automatic equipment will do. This will be of no practical benefit on a system which has a fairly steady load throughout the normal hours of the day, but it will at least be an insurance that there are no idle running losses.

3. On account of the increased number of substations in an automatic system, there results a considerable reduction in the size and length of feeders, and a saving that will go a long way toward paying the investment cost in automatic equipment. This reduction in the magnitude of the feeder system accomplishes considerable saving in line losses.

4. On city properties the automatic substation will have a very favorable effect on electrolysis conditions because of the increased number of substations and reduction in length of feeds.

5. A substantial saving per substation can be made in the building cost because it is practical to erect a cheaper building if the conveniences necessary for a hand-operated station are omitted. The small size of the building will make it possible to put it in places that are beyond consideration for a multi-unit hand-controlled substation.

6. By the use of automatic equipment it is possible to raise the load factor on machines, thereby making use of smaller units than is possible in the manually operated station. This is of considerable importance on interurban lines having a high starting peak and low average load.

The limit to which this equipment can be economically installed is reached when the carrying charges on an automatic substation installation, together with its feeder system, equal the operating and carrying charges on a manually operated substation plus its feeder system. Although there is no question about the applicability of the automatic station to interurban and small city properties, the advisability at its introduction is debatable on a heavy city property which has a dense load per square mile, such as exists in the Loop and densely populated residential district of Chicago. This problem can only be answered by a very careful analysis of the situation at hand.

Probably one of the most extensive fields for the automatic stations is in steam railroad electrification work, where the conditions are ideal for its application, namely, heavy peak service and comparatively long train interval. The limitations of both a.c. and d.c. power systems of steam roads have been fairly well known for some time, but the advent of automatic substations has extended the possibility of the d.c. system to limits far beyond those previously set, and it will undoubtedly receive very careful consideration in future electrifications.

RESULTS ON NORTH SHORE ROAD

The history, condition and general results of automatic substation on the Chicago, North Shore & Milwaukee Railroad are as follows:

In 1916 manually operated substations were located approximately 13 miles apart. On account of the purchase of new car equipment it was necessary to increase the power facilities. Consideration was given to three methods; namely, addition of feeder copper, increase of line voltage and the installation of automatic substations. The two first were prohibitive on account of the great cost, and it was decided to install automatic stations located approximately half way between the manually operated stations. Two of these were installed in 1917, a third in 1918 and a fourth in the spring of 1919. One of the hand-operated stations was changed to automatic in the spring of 1920 and a fifth station is now being installed.

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*Abstract of paper read before joint meeting of A. I. E. E. and W. S. E., Chicago, Dec. 17, 1920.

These equipments, which have been in service from one to three years, have been subjected to very heavy service and have given excellent operating results. In several instances we have run into the usual operating difficulties that are encountered in substation work, and the automatic equipment has taken care of these cases in a manner just as satisfactory, if not more so, than in hand-operated stations.

It has been our practice to make a daily inspection of stations, and by means of recording devices mounted on certain pieces of apparatus we have been able to follow the operation very closely, so that I have no hesitancy in saying that there is no reason why a system such as ours could not be operated practically automatic throughout, with the exception of the necessary high-tension line switching. I feel that within a very short time we shall see very extensive installations made.

Automatic Railway Substations

BELOW appears a list of the automatic substations recently installed or on order by the General Electric and Westinghouse companies, which supplements a similar table published in the JOURNAL for Jan. 4, 1919. Those installations which, at the time the other table was published, had not been placed in commission, or regarding which full information was not available, are included in the present tabulation.

AUTOMATIC SUBSTATIONS INSTALLED BY OR ON ORDER WITH GENERAL ELECTRIC AND WESTINGHOUSE COMPANIES

Company	No. of Stations	No. of Machines	Kilowatt Rating	Type of Machine	Direct Current Voltage	High-Tension Voltage	Frequency	Remarks	Placed in Operation
Ohio Electric Railway	1	1	500	Synchronous converter	600	33,000	25		May, 1918
Conestoga Traction Company	1	1	300	Synchronous converter	600	11,000	25	Motor started	September, 1918
New York State Railways	1	1	250	Synchronous converter	600	11,000	25		February, 1919
Conestoga Traction Company	1	1	500	Synchronous converter	600	11,000	25		March, 1919
Des Moines City Railway	1	1	500	Synchronous converter	600	2,250 4,500	25		March, 1919
Cincinnati, Lawrenceburg & Aurora Electric Street Railway	2	2	200	Synchronous converter	600	33,000	60		March, 1919
New York State Railways	1	1	300	Synchronous converter	600	60,000	40		April, 1919
Northern Ohio Traction & Light Company	2	2	500	Synchronous converter	600	22,000	60		May, 1919
Joplin & Pittsburgh Railway	1	1	300	Synchronous converter	600	22,000	60		May, 1919
The Sheffield Company	1	1	500	Synchronous converter	600	2,200	60		June, 1919
Kansas City Railways	1	1	1,000	Synchronous converter	600	6,600	25		June, 1919
Chicago, North Shore & Milwaukee Railroad	1	1	1,000	Synchronous converter	600	13,200 33,000	25		June, 1919
Duluth Street Railway	1	1	500	Synchronous converter	600	13,200	25		June, 1919
Transit Supply Company	1	1	1,500	Synchronous converter	600	12,500	35		July, 1919
Omaha & Council Bluffs Street Railway	1	1	1,000	Synchronous converter	600	13,200	25		July, 1919
Pacific Electric Railway	1	1	1,000	Synchronous converter	600	15,000	50	Slauson Junction	July, 1919
Salt Lake, Garfield & Western Railway	2	2	600	M-G set	1,500	44,000	60	One-remote control	August, 1919
Duluth Street Railway	1	1	1,000	Synchronous converter	600	13,200	25		August, 1919
Pacific Electric Railway	1	1	1,000	M-G set	600	15,000	50	Wilmington	August, 1919
Pacific Electric Railway	1	1	1,000	Synchronous converter	600	16,500	50		August, 1919
Joplin & Pittsburgh Railway	2	2	300	Synchronous converter	600	33,000	25	Motor started	August, 1919
Kansas City Railways	1	1	750	Synchronous converter	600	6,600	25		October, 1919
New South Wales Government Railways	1	1	200	Synchronous converter	600	6,600	25	Remote control	November, 1919
Chicago, North Shore & Milwaukee Railroad	1	1	500	Synchronous converter	600	13,200 23,000	25	Libertyville	November, 1919
Pacific Electric Railway	1	1	1,000	Synchronous converter	600	16,500	50	Hermosa	November, 1919
Oklahoma Union Railway	1	1	300	Synchronous converter	600	6,600	60		January, 1920
Wisconsin Light, Heat & Power Company	1	1	300	M-G set	600	66,000	60		January, 1920
Interurban Railway, Des Moines	1	1	500	Synchronous converter	600	22,500	25	Moran	January, 1920
Interurban Railway, Des Moines	1	1	300	Synchronous converter	600	22,500	25	Granger	January, 1920
Sacramento Northern Railway	1	1	300	Synchronous converter	600	2,300	60	Portable	January, 1920
Kansas City Railways	1	1	750	Synchronous converter	600	6,600	25		March, 1920
Iowa Railway & Light Company	1	1	500	Synchronous converter	600	16,500	60		April, 1920
Pacific Electric Railway	1	1	1,500	Synchronous converter	600	16,500	50	Maple Avenue	April, 1920
Michigan Central Railroad	1	1	2,000	M-G set	650	4,400	60	Remote control	May, 1920
Missouri & Kansas Interurban Railway	2	2	300	Synchronous converter	600	33,000	60		June, 1920
Cleveland Railway	1	2	1,500	Synchronous converter	600	11,000	60		August, 1920
Lehigh Valley Traction Company	1	1	500	Synchronous converter	600	13,200	25		September, 1920
St. Joseph Railway, Light, Heat & Power Co.	1	1	300	M-G set	300	23,000	60		October, 1920
Iowa Railway & Light Company, for Cedar Rapids & Iowa Railway	1	1	300	Synchronous converter	600	33,000	60		December, 1920
Grand Rapids, Grand Haven & Muskegon Railway	1	1	350	Synchronous converter	600	13,500	30	Motor started	December, 1920
Chicago, North Shore & Milwaukee Railroad	1	1	1,000	Synchronous converter	600	23,000 33,000	60	Ravinia Park	January, 1921
Indianapolis & Louisville Traction Company	1	1	500	Synchronous converter	600	33,000	60		January, 1921
Christ Church Tramway, New Zealand	1	1	300	Synchronous converter	600	11,000	50		*1920
New South Wales Government Railways	1	1	450	Synchronous converter	600	6,600	25	Narrabean-remote control	*1920
New South Wales Government Railways	1	1	450	Synchronous converter	600	6,600	25	Abbotsford-remote control	*1920
Chicago & Joliet Electric Railway	1	1	300	Synchronous converter	600	13,200	60		
Ironwood & Bessemer Railway & Light Co.	1	1	300	M-G set	600	2,300	60		
Iowa Railway & Light Company	1	1	500	Synchronous converter	600	33,000	60		
Sacramento Northern Railway	1	1	300	Synchronous converter	600	2,300	60		
United Railways of St. Louis	1	1	300	Synchronous converter	600	13,200	25		
Hershey Cuban Railway	1	1	300	Synchronous converter	600	22,000	60		
Niagara, St. Catherines Railway	1	1	500	Synchronous converter	600	12,500	25		
Christ Church Tramway, New Zealand	1	2	300	Synchronous converter	600	10,500	50		
City Railway, Los Angeles	1	1	1,000	Synchronous converter	600	17,000	50		
Pacific Electric Railway	1	1	750	Synchronous converter	600	16,500	50		
Dayton & Western Traction Company	3	3	500	Synchronous converter	600	33,000	60		
Victorian Railways, Melbourne	8	8	1,000	Synchronous converter	1,500	2,000	25		
Interurban Railway, Des Moines	1	1	750	Synchronous converter	600	22,500	25		
Dayton & Troy Electric Railway	1	2	300	Synchronous converter	600	6,600	60	Operate in parallel	
Hershey Cuban Railway	2	2	1,000	Synchronous converter	1,200	33,000	60	Two units in series	
Fort Wayne & Decatur Traction Company	1	1	400	Synchronous converter	1,200	33,000	60	Two units in series	
Cleveland Railway	2	4	1,500	Synchronous converter	600	11,000	60	Two units in parallel	
Cleveland Railway	1	2	1,500	Synchronous converter	600	11,000	60	Two units in parallel	
Pacific Northwest Traction Company	1	1	500	Synchronous converter	600	13,200	60		
Milwaukee Electric Railway & Light Company	1	1	1,000	Synchronous converter	250	13,200	60	Three-wire service	
Toronto Hydro-Electric Company	1	1	1,000	Synchronous converter	600	13,200	25		
York Railway	2	2	500	Synchronous converter	600	13,200	60		
Petaluma & Santa Rosa Railroad	1	1	300	Synchronous converter	600	45,000	60		
Steubenville, East Liverpool & Beaver Valley Traction Company	1	1	300	Synchronous converter	600	13,200	60	Motor started	
Milwaukee Electric Railway & Light Co.	1	2	500	Synchronous converter	600	66,000	25	Two units in parallel	
Northern Texas Traction Company	1	1	500	Synchronous converter	600	13,200	25		
United Railways of St. Louis	1	1	300	Synchronous converter	600	13,200	25		
Boston & Maine Railroad	1	1	300	M-G set	600	2,200	60	Synchronous motor	
Chicago, South Bend & Northern Indiana Railway	1	1	300	Synchronous converter	600	25,000	60		
Los Angeles Railway	1	1	1,000	Synchronous converter	600	15,000	50		
Salt Lake & Utah Railroad	1	1	500	M-G set	1,500	2,300	60		

* These stations are probably in operation, though exact date is not yet available.

Progress of the One-Man Safety Car[*]

This General Treatise Reviews the Advent of the Light-Weight One-Man Safety Car, Points Out the Present Status and the Future Prospects of Design and Utilization and Cites the Economic and Service Results Which Have Been Obtained

BY HARRY L. BROWN
Western Editor ELECTRIC RAILWAY JOURNAL

HIGHER schedule speeds, platform expense cut in half and energy cost greatly reduced are the qualities of the safety car which make it possible to give greatly improved transportation service and meet competition of automotive vehicles—private automobiles and jitneys.

Until recently very little information on the energy consumption of this type of car was available. Some interesting data are now coming to hand, however, from companies whose cars have been equipped with Sangamo Economy watt-hour meters. In El Paso, Tex., where the topography is flat, the energy consumption per car-mile at the car, averaged over a three-month period, was found to be 2.44 kw.-hr. for double-truck cars, 1.45 kw.-hr. for single-truck cars and 0.95 kw.-hr. for safety cars. These figures and those following cover only the energy consumption of the main motors. In Kansas City on the Westport-Sunset Hill line, operated exclusively with safety cars under service conditions considered most severe, the energy consumption averages 1.2 kw.-hr. per car-mile. At Gary, Ind., the consumption has been found to be 1.1 kw.-hr. per car-mile. In Seattle, under extremely hilly conditions, the average energy consumption over an eight-month period was 1.38 kw.-hr. per car-mile for safety cars and 3.37 kw.-hr. per car-mile for double-truck cars, the data covering fifty safety cars and 350 double-truck cars. In Quincy, Ill., the average energy consumption for safety cars for all lines on the system was found to be 0.95 kw.-hr. per car-mile with a system average schedule speed of nearly 10 m.p.h. At the station buses this energy consumption measured 1.78 kw.-hr. per car-mile. In Vincennes, Ind., during a thirty-day period with average loading throughout the period of 4.7 passengers per car-mile, the energy consumption was 0.75 kw.-hr. per car-mile.

An interesting side-light on this subject of energy consumption is that on the average, for various systems, there is a difference of about 1 kw.-hr. per car-mile between the meter readings on the car and those at the station switchboard, representing energy consumed in line losses and negative return losses, and in running the air compressor, heaters, lights, electric buzzers, signals, etc.

RESULTS FROM SOME INSTALLATIONS

One of the most interesting installations of safety cars that I recall gives a good idea of the many ways in which these little cars serve to improve the situation faced by the street railway companies. On the Arlington Heights line, Fort Worth, Tex., which is 4.88 miles long one way, four 7-ton one-man safety cars replaced five 12-ton two-man single-truck cars for the base service. With an increase in the schedule speed from 9 to 11 m.p.h., the same headway of twelve minutes was maintained, this being ample in view of a diminishing traffic following the abandonment of a small army camp served by the line. The service, measured in seats per hour, remained practically the same. The track, much of which was open, was in bad condition, and while the old single-truck cars rode so roughly as to be dangerous, the safety cars, operating at higher speed, negotiated the rough track with no discomfort to passengers. Furthermore, the voltage drop on the line with the old cars was excessive, but with the new cars, fewer in number and each pulling less current, the voltage drop was not unsatisfactory. Thus the installation of safety cars enabled the company safely to defer track repair expense and avoid more investment in overhead copper.

The table below gives a comparison of the cost of operation of these lines for the two weeks just prior to the safety-car installation, with that for the first two weeks of safety-car operation. Including the tripper and extra service in this summary, there were operated in the second two-week period eighteen fewer car-hours but 157 more car-miles.

Daily saving in cost of energy	$4.18
Daily saving in cost of maintenance	7.75
Daily saving in platform expense	55.66
Total daily saving in operating expenses	$67.59
Total annual saving in operating expenses	$24,670.35

This case illustrates only the economical aspect of safety cars, for on this line the twelve-minute headway was all that was warranted by the traffic that could be secured.

Table I gives interesting information from other cities.

TABLE I—RELATION BETWEEN INCREASE IN CAR-MILES AND IN GROSS REVENUE, VARIOUS CITIES

City	Line	Increase in Car-Miles, Per Cent	Increase in Gross Receipts, Per Cent
Kansas City, Mo.	Sunset Hill	47	19
Richmond, Va.	Belmont Ave.	55	23
Richmond, Va.	Laurel St.	40	20
Houston, Tex.	Woodland LaBranch	45	60
El Paso, Tex.	1	47.5	50
El Paso, Tex.	2	50	36.7
Tacoma, Wash.	1	75	42
Tacoma, Wash.	2	20.9	25.8
Tacoma, Wash.	3	3.4	17.31
Tampa, Fla.	Woodlawn	60	62
Tampa, Fla.	Nebraska	52	51.4
Tampa, Fla.	West Tampa	70	61

The car about which we are talking has been called the "safety" car. The name was derived from the effort made so to equip it with automatic safety devices that the use of a one-man crew would entail no extra hazard to passengers. Table II on page 178 gives some detail evidence of how well it has lived up to its name in Terre Haute compared with the two-man cars.

The substance of this study is that the number of accidents of all kinds per 100,000 car-miles is slightly higher for safety cars than it is for two-man cars, but, due probably to the light weight of the safety cars, the number of accidents involving expense is substantially less. Also, the cost of accidents per 1,000 car-miles is only about one-half as much for safety cars as for two-man cars. Here, again, the relative weight of the cars is probably the most important factor in the difference.

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[*] Abstract of paper read before joint meeting of A. I. E. E. and W. S. E., Chicago, Dec. 17, 1920.

THE STANDARD CAR AND TENDENCIES IN DESIGN

In designing the one-man safety car the builders conceived the idea of developing a standard car that could be produced on a quantity basis with resultant lower cost to the consumer and better profit to the car builder. Standardization of electric railway equipment had been a constant topic of association discussion for years, but little real progress along this line had been accomplished. With the advent of this new type of car, however, embodying a radical departure from all previous practices, there seemed to be a good opportunity to start standardization in earnest. By tenaciously holding to the fundamentals of the design, the original designers have succeeded to a remarkable degree in preserving their aim in this direction, and hence of being able to build cars for stock regardless of the city in which they would ultimately be used. In fact, it is now actually possible to order street cars from stock almost as one does an automobile.

TABLE II—ACCIDENT RECORDS IN TERRE HAUTE FOR SAFETY CARS AND TWO-MAN CARS

Twenty-three Months, Dec. 1, 1918, to Oct. 31, 1920

	Safety Cars	Two-Man Cars
Total accidents reported	786	270
Deduct accidents causing no damage to persons or property	553	107
Accidents involving expense	233	163
Total cost, all accidents	$32,259.32	$22,253.73
Average cost per accident (those involving expense)	$138.45	$136.52
Average cost per accident (all reported)	$81.04	$82.42
Total car-miles (thousands)	708.1	1,376.0
Number of accidents, all kinds, in each 100,000 miles	21.1	20.0
Number of accidents, involving expense, in each 100,000 miles	6.28	11.8
Or, one in every	15,923 miles	8,478 miles
Average cost accidents per 1,000 car-miles	$8.69	$16.17
Number of cars operated, beginning of period	15	16
Number of cars operated, end of period	49	1

The original standard safety car had a practically all-steel, arch-proof, single-end body with a 30-in. single door at the front end for entrance and exit. It was equipped with fourteen cross-seats and an end seat, affording capacity for thirty-two passengers. It was mounted on a single truck with a 9-ft. wheelbase and equipped with two 25-hp. motors and 24-in. wheels. The motors, air-brake system, air compressor, control and other equipment were all of a special type, newly designed for the innovation in the urban transportation world. These first cars, completely equipped, weighed but 12,500 lb. or 390 lb. per seat—a new low record in the industry.

Desirable as this light weight was from an energy-economy standpoint, it soon developed, after the first cars were in service, that they were too frail and would have to be strengthened. The demands of the industry in this connection, based on experience in using the cars, have been so insistent that the manufacturers have been forced to strengthen the car from time to time in one member and another, both body and truck, until now the standard single-end safety car weighs approximately 16,000 lb. or 500 lb. per seat, and the standard double-end safety car weighs 16,600 lb. or 519 lb. per seat.

In addition to these vital questions of weight and strength in safety-car design, there have been numerous other less important tendencies away from the exact standard safety car. For the more northern cities it has been necessary to use interior side sheathing and headlining to make the car warmer, and in some cases extra heating elements have been specified. Double flooring has been required for the same reason in the north, and in other cities managements have insisted on this to reduce the noise within the car. Some railway managements have insisted on spring-cushion seats, and others have required that the interior of the car be better finished for sake of appearance. In a few cases, the arrangement of seats has been changed, the end cross-seats being turned longitudinally to provide a larger well for standing passengers. There has also been some demand for a wider aisle, seats a little wider, and in general that the car should be a little more generously dimensioned.

There is a more important change in the body design than those just mentioned, which is being advocated by operating men in increasing numbers, despite strong opposition. It is urged that there ought to be a separate passageway for the ingress and egress of passengers so that two opposing streams of passengers can be moving simultaneously while the car is standing. At present, with the single doorway for both entrance and exit, it is necessary for boarding passengers to wait until all the leaving passengers have got off before they can get on. This is an annoyance to patrons and lengthens the stopping time of the car. Whether separate exit and entrance are desirable or not, the sentiment for them has been steadily gaining ground. This applies to small and large city users alike, and double-door cars have already actually been built for Mason City, Iowa; Madison, Wis.; Fort Wayne, Ind., and two or three other cities. In Madison single-door safety cars were replaced with new and rebuilt safety cars equipped with double doors.

The desirability for this change to double doors and more generous dimensioning is also closely associated with the idea of using safety cars on many of the lines of the largest city systems. It is felt by many that these slight changes would greatly extend the field of adaptability of the standard cars.

There are numerous lines in Chicago as in other big cities where safety cars could be installed with resulting improvement in service, better earnings, gross and net, and a better pleased public. Where these cars are used they should not be permitted to be overloaded unduly, for the inherent skip-stop feature of the small load, and the slow ingress and egress of passengers in a jam, would slow up the speed and defeat the advantages which otherwise accrue.

When safety cars are used on these heavier city lines, several things can be done to aid their success or enhance the economies and increased earning power they afford. One of these is a slight change in the design of the car body, which has already been discussed. Another is the use of a street collector at heavy loading points to aid the operator. He should be placed either at the rear emergency door, as is done in Kansas City, or at the regular entrance, simply to make change, sell tickets, etc. Still another thing that might serve to speed up the little cars would be to make use of a combination pay-enter, pay-leave, fare collection system. On runs where there is a scattered loading and a concentrated unloading, passengers would pay as they enter. On runs with heavy loading concentrated in a small district and a scattered unloading, passengers would pay as they leave. On many lines this should result in materially speeding up the service.

Real Service in a City of 30,000

Indiana Railways & Light Company, Which Operates In and Around Kokomo, Has Found that the Safety Car Pays—Some Construction and Operating Data Are Given

By C. T. Dehore
General Electric Company, Cincinnati, Ohio

IT IS a real problem to give electric railway service in a city of 30,000 population and come anywhere near breaking even. Kokomo appears to be doing it with the aid of safety cars. Up to July 1, 1920, the service on the main city line in the city was on a ten-minute headway, requiring four double-truck cars, seating about forty-four people and weighing 16 tons. Three or four trippers were put on morning and evening. Generally speaking, the service was above the average for cities of this size, and the rolling stock was modern and well maintained.

TABLE I—PASSENGER BUSINESS IN KOKOMO BEFORE AND AFTER INSTALLATION OF SAFETY CARS

Month	1919	1920	Increase	Per Cent of Increase
July	253,779	314,064	60,285	24
August	267,557	321,731	54,174	20
September	285,696	334,949	49,253	17
October	249,528	315,975	66,447	27
November	253,241	313,512	60,271	24

The management of the company, after a study of the performance of safety cars throughout the country, and particularly in Terre Haute, decided in January, 1920, to purchase ten safety cars. The cars went into service on July 1.

The four large cars referred to were replaced with eight safety cars on a six-minute headway. This reduced the schedule speed from 9.6 to 7.5 m.p.h., and the round trip running time increased from forty to forty-eight minutes.

TABLE II—CAR-MILES AS INCREASED BY SAFETY CARS IN KOKOMO

Month	1919	1920	Increase	Per Cent of Increase
July	37,535	49,160	11,625	31
August	39,845	49,935	10,090	25
September	38,288	50,020	11,732	30
October	36,875	49,070	12,195	34
November	36,184	46,890	10,706	30

As a result of the new service numbers of passengers carried increased as shown in Table I and the car-miles were increased as shown in Table II.

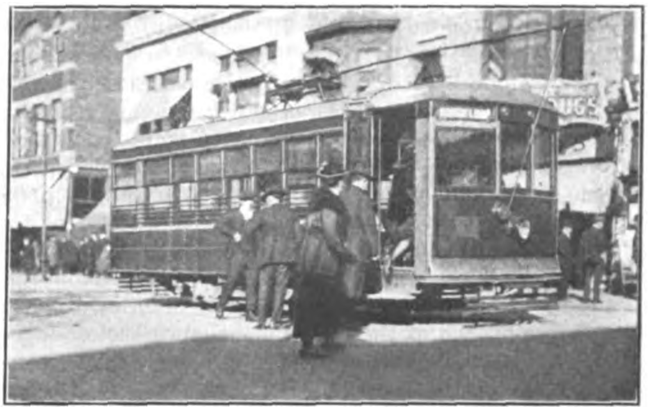
Cost of Operation as Affected by Safety Cars

The power consumed by the eight safety cars is approximately the same as before, except that some little additional is required for heating because the new cars are better heated. The cost of power is, therefore, practically only increased due to increase in the cost of coal and other items of production.

The total cost of maintenance of equipment is running about the same as before. Up to date repair material for the maintenance of the new cars has cost less.

Platform expense has increased slightly, due to an increase in rate of pay. The old rate was 34 to 39 cents; the new is 40 to 45 cents.

The inspection of equipment is very rigid and the cars are kept scrupulously clean. Immediately upon the development of any defect or irregularity, such as leaks in any of the air valves or equipment, etc., the inspector sends the car to the shop. The same shop force handles the eight safety cars as previously looked after the four double-truck cars. One car cleaner has been added.


THE KOKOMO SAFETY CAR IS POPULAR

The reduction in the schedule speed from 9.6 to 7.5 m.p.h. was made with the idea of reducing the number of collisions with automobiles and other vehicles. The result in this regard has been gratifying, while boarding and alighting accidents have been eliminated entirely.

TABLE III—DETAILS OF KOKOMO SAFETY CAR

Builder	American Car Company
Type	Standard Birney Safety
Seats	32
Motors	GE-264-A
Control	K-10 double end
Seats	Brill Waylo
Air compressor	GE-CP-25, 10 ft.
Governor	GE-ML-A-1
Registers	International air operated
Signs	Keystone

Some of the "Reactions" Produced

At first the operators were skeptical as to the practicability of the cars, as well as their own ability to operate them. However, this feeling has since worn away and the men are now very enthusiastic over their performance.

The public is pleased with the new cars and the people of Kokomo feel that they are being given "real service."

TABLE IV—SUMMARY OF KOKOMO SAFETY CAR DATA

	1919	1920	Percentage, Increase	Percentage Decrease
Number of cars operated	4	8	100	...
Number of men required	8	8	..	..
Headway	10 min.	6 min.	..	40
Miles per hour	9.6	7.5	..	22
Running time	40 min.	48 min.	20	...
Car-miles	188,727	245,075	30	...
Passengers	1,309,801	1,600,231	20	...

	1919	1920
Rate per hour	34 to 39 cents	40 to 45 cents

The railway management feels that the demands of the public for increased service could not have been met in any other way without a material increase in the rate of fare or the incurring of a large operating loss.

The details of the car are given in Table III.

The Kokomo installation was made under the direction of Phil H. Palmer, general manager Indiana Railways & Light Company, who furnished the above data.

Some Pennsylvania Commission Policies

Chairman Ainey in an Address to the Philadelphia Chamber of Commerce Outlines the Underlying Laws and Policies of the Pennsylvania Commission — Commission Regulation Supersedes Contractual Relations

IN A recent address to the Philadelphia Chamber of Commerce W. D. B. Ainey, chairman of the Public Service Commission of Pennsylvania, outlined some of the important features of the organization and authority of the Pennsylvania Commission.* He pointed out that with the passage of the public service company law, which went into effect Jan. 1, 1914, there was inaugurated an entirely new method of utility control for Pennsylvania, although commission regulation had existed for many years in other states. The commission, while not strictly a judicial body, as it is an arm of the legislative branch of the government, nevertheless bases its judgment on evidence and not upon private communication or petitions.

REGULATION'S PURPOSE IS TO PRESERVE UTILITIES

Mr. Ainey said that public service regulation would have been comparatively simple when the commission started to work, "if all public service corporations could have been, on that day, re-created and the program and policy of the commission directed solely to the future, but nearly all of these corporations came into existence under general laws or special statutes passed many years before. There had been created under them situations which after Jan. 1 would not have been permitted, but which under the law theretofore existing were, in most instances, perfectly legal." He further pointed out that the enactment of the law was in recognition of the fact that utility service was important to the Commonwealth and that the preservation, not destruction, of the companies was essential to public welfare and convenience.

One necessary purpose was to get rid of discriminatory or preferential contracts where these existed under conduct or contract and the Legislature made certain prohibitions with reference to rates and practices. "This brings us to a differentiation which, in considering the public service company law, we must make between those policies which have been (a) legislatively adopted by the state and therefore are as binding on the commission as they are upon utility companies and their patrons and (b) those which are adopted by the commission under the broad discretionary powers lodged with it."

The law impressed upon utility companies the character of public servants and almost entirely removed them from the realm of corporations, but emphasized in so doing that "their services were required by the public and their preservation was essential for the public good." In line with this, limitations were imposed upon revenues, limiting them to a fair return, and thus rates and service devolved upon the commission. In the exercise of this power comes the application of the principle that the government might interfere with charter powers and privileges theretofore granted, if the general public welfare is involved, and thus "contracts are no longer inviolate when they stand in the way of an important public policy."

Another point related to this is that any regulatory policy of the state directed toward the companies must likewise regulate their patrons and the public itself, if it is to be effective. Thus municipal and private contracts fixing rates and determining revenues and service must also give way whenever they are in conflict with the aims desired. On this point he said:

> "I have in mind a street railway operating through several municipalities; in one there was a 3-cent fare fixed in an ordinance, in another a 5-cent fare, and in some others no rates of fare were prescribed. The increased labor and material costs were such that the operating expense exhausted the revenues. It became necessary to increase the fares, if service was to be continued. If the legislative hands were tied and these contract rates were continued the entire burden of the increase would have had to be placed upon the riders in the municipalities having no contracts, and the others would be relieved. Admittedly no more unjust, inequitable or discriminatory situation could arise. The public service company law was intended to correct such injustices. Private contracts afforded opportunity for the best or more influential trader to secure better rates than others not so aggressive or powerful."

Likewise if there are standards of service and limitations of revenues, then any unusual burden "contractual or otherwise" which prevents the preservation of the utilities and the rendition of adequate service at reasonable rates cannot, and ought not, to be continued, in the interests of the public itself.

Mr. Ainey showed that the power thus exercised by the state is not unique and he found similarity in the eminent domain laws, health laws and tax laws. "Public service and private rate contracts," he said, "are incongruous when they conflict. Rates themselves cannot be based, if they are to be equitably apportioned among patrons, upon private contracts any more than taxes can be fixed by agreement between tax collectors and property owners. There is a striking similarity between taxes and public service rates in so far as the bases upon which they are imposed is concerned."

LAW, NOT COMMISSION, INVALIDATES CONTRACTS

Again adverting to distinction between legislative policies and discretionary policies which are prescribed by the commission, Mr. Ainey pointed out that the former have become the settled law of the Commonwealth, equally binding upon commission and public. The commission determines reasonable and just rates in service, but when the rates are determined, "the law and not the commission declares any conflicting contract rates invalid. . . . The whole duty of the commission under the statute is to ascertain what are the just and reasonable rates, and automatically the statute is applied as against any other rates arising on contracts."

Mr. Ainey then showed that the commission had within its discretion adopted the "non-competitive rule" as a policy, but said that "when the reason for the rule fails, the rule itself must fail." The theory of this rule is that duplication of facilities requires a duplication of investment and capital, and there is thus imposed a double burden upon the rate payers. All that competition does is to hold rates to a reasonable basis, and this is done by the commission.

In closing Mr. Ainey said that these public utility questions are but a part of the great economic questions which confront the country today and which demand of all the most thoughtful consideration. "There is no more patriotic service to which we may give our attention. The times stress them upon us. We must approach them with disinterested and highest motives, but fearlessly and forcefully."

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*A subsequent article, now in preparation, will describe in detail the organization and methods of the Pennsylvania commission.

Indiana Utilities Join in Meeting Devoted to Public Relations

Presidents Gadsden, Insull and Munroe of American Electric Railway, Electric Light and Gas Associations Were Speakers at the First Annual Meeting, Which Was Attended by More than 250 —Addresses Given by Commissioner Paul P. Haynes and E. K. Hall, American Telephone & Telegraph Company—Charles L. Henry Presided

THE first annual meeting of the Indiana Public Utility Association, formed about a year ago to sponsor the Indiana Committee on Public Utility Information, proved to be a conspicuous success and of far-reaching value. The meeting, with an attendance of more than 250, began at a 12:30 luncheon in Indianapolis, Jan. 13, and extended through the afternoon and a dinner in the evening. It was devoted entirely to the consideration of improving the relations of the utilities with the public. Charles L. Henry, president Indianapolis & Cincinnati Traction Company, as first and re-elected president of the new association, presided at the luncheon, afternoon and dinner sessions. The program included addresses by the presidents of the American Electric Railway Association, the National Electric Light Association and the American Gas Association and by a prominent telephone man, a member of the Indiana Public Service Commission and the Mayor of Indianapolis. Harry Reid, president Interstate Public Service Company, Louisville, Ky., and vice-president of the Indiana Association, was largely responsible for the excellent program of timely papers.

Six Points Made by Commissioner Paul P. Haynes at Indianapolis Meeting

1. The average increase in utility rates during the last four years has been substantially less than the increase in the price of other necessities.

2. The utilities generally have earned less than a fair return on their sound valuation and they should now be permitted to recoup reasonable losses.

3. Existing rates are not based on peak war costs and therefore considerable reduction in prices of commodities will have to be experienced before these prices reach the present basis of present rates.

4. During these four lean years there has been an immense accumulation of deferred maintenance which must be taken care of.

5. The sum of $100,000,000 should be expended in the next two years in Indiana to provide needed extensions and improvements, and the public should know that this money cannot be had unless the credit of the utilities is restored through better revenue.

6. The situation demands a sympathetic understanding of these facts on the part of the public.

Mr. Henry spoke briefly of the organization of the Indiana Public Utility Association to include all classes of utilities into a compact organization for the purpose of providing a more effective machinery with which to deal with the common problem of public relations. He said there will be no attempt to revolutionize things in Indiana, but that the association will function to bring to the citizens of the State the things they ought to know about their public utilities.

To correct any possible misapprehension Mr. Henry pointed out that there was no desire to endeavor to dominate governmental agencies or legislation in any way. He called particular attention to Article II of the constitution of the association, adopted at this meeting, as the best expression of the object of the association. This article reads as follows:

> The object of this association shall be the collection and dissemination of information relating to the operating, technical and commercial conditions and problems affecting public utilities, and upon those questions affecting the relations between public service companies and the communities which they serve, so as to assist the companies in the management of their affairs in serving their communities and in promoting cordial relations between the public and themselves, and to cultivate friendly and social relations between the officers and employees of the several companies.

Mr. Henry also laid particular emphasis on the point that the utilities are on trial every day in the year, and that while this circumstance places them in a position which is very difficult and trying men occupied in this work ought to be very proud of their positions.

Paul P. Haynes, member of the Indiana Public Service Commission, then addressed the association, making statements to which repeated references were made by later speakers representing the utilities. He said that it is the usual contention that there are two sides to the utility business, but that he was of the opinion that there is but one side. The interests of the public utilities and of the public are so inextricably associated that what is good for the public is good for the utility, and vice versa; that when one prospers or suffers, the other does likewise. Referring to the work of the newly formed association, he said that to the extent that the association approaches the utility problems as public problems, to that extent will the asscciation's work be successful.

The commissioner then explained how utility rate increases have lagged far behind the increases in prices of commodities generally. In other words, the orders of the utilities commissions have not been prompt enough to keep the utilities in sound financial condition. He said that we are now reaching a turning point, that prices are very generally on the decline. This fact, he said, bids fair to react very unfavorably upon the utilities unless the public is brought to understand that it would be to the public's own serious detriment to insist upon rate reductions immediately. Rate reductions must be made in time, but they must be made intelligently and with full consideration for the deficits which the utilities have accumulated as the result of the slowness with which increased rates came. In this consideration, the commissioner mentioned six things which, he said, must be brought home to the public:

(1) That the average increase in utility rates during the last four years has been substantially less than the increase in the price of other necessities; (2) that the utilities generally have earned less than a fair return on their sound valuation and that they should now be permitted to recoup reasonable losses; (3) that existing rates are not based on peak war costs and therefore that considerable reduction in prices of commodities will have to be experienced before these prices reach the present basis of present rates; (4) that during these four lean years there has been an immense accumulation of deferred maintenance which must be taken care of; (5) that $100,000,000 should be expended in the next two years in Indiana to provide needed extensions and improvements, and the public should know that this money cannot be had unless the credit of the utilities is restored through better revenue; (6) that the situation demands a sympathetic understanding of these facts on the part of the public.

Mr. Haynes said that rates must come down after a while to a level corresponding with what shall be considered normal prices of commodities, but that reduction in rates cannot be expected simply because some one reads in the morning paper that prices are coming down and hastens to demand that utility rates be adjusted accordingly. Even if the selfish interests of the utilities are eliminated altogether, still, in the best interests of the people, rates should not be reduced immediately. He contended that it is the duty of a commission to see that the utilities are not only solvent but that they are maintained in a healthy condition, with good credit and able to give good service. He also said that the utility that renders better service and has a high regard for the public served should be rewarded liberally. Service is the primary obligation of the utility, and it must precede every other consideration. The commission cannot do its part unless the utility does its part in giving service, with open and aboveboard practices. He contended that service first should be the watchword of the utilities and thought that the public would respond to the needs of a company if it is thought that this company is doing its best and really striving to meet the needs of the public and be a real public servant.

ADDRESS OF MARTIN J. INSULL

Martin J. Insull, president of the National Electric Light Association, spoke at length with the primary object of telling the utility operators what they ought to do and say to the public. Speaking of the attitude of mind of utility men and the public, Mr. Insull said that most of us think that running the utility is our business and the public thinks that it is none of its. Both are wrong, he contended, and he then endeavored to urge upon the utility man the idea that he must make it a part of his duty to spread information about the utilities to the public and make the public understand that it has a real interest in the utility business. He took issue with Commissioner Haynes that service must be the first and foremost consideration. It was his opinion that service and rates must go together, for it is impossible to give service unless reasonable rates can be charged. He made the point that people do not think much about the service received until it becomes poor service. The public is so accustomed to good service that it has no thought of this matter until the time comes when it receives poor service, when it is prompt to voice its discoveries.

Mr. Insull then brought up the question of what it would mean if the utilities should shut down, and discussed what the utilities mean in modern business and domestic life. He made the observation that if the utilities in a community are all run down it is safe to say that the community itself is going backward and there is something decidedly wrong with it. The growth of a community and of its utilities go together; in fact, the utility growth should be a little ahead of that of the community.

He said that now is the psychological time to educate the public, and emphasized that not all of this work can be done through the printed word, but that a lot of it must be done by word of mouth. He referred to the treatment received by the railroads and pointed out how disastrous and costly to the people, as well as the railroads, this policy had been. He thought if the utilities are to receive a similar treatment the cost to the public will be even greater. He reiterated the statement of Commissioner Haynes that the utilities should be allowed to carry present rates for a while in order to offset the long period during which they were using up working capital, or living off their fat, so to speak. In their effort to take care of public demands, they used up all of their reserves and rapidly reached the point of losing their credit.

He compared the rapidity with which money is turned over in an ordinary merchandising business with the slow process which takes place in the utility field, and contended that as a result of this there is no real profit in the utility business. There is no surplus to be put aside and all new extensions of service must be financed out of new money brought into the business from outside. But in the money market, which is very highly competitive, the utility finds it necessary to compete against the highly profitable merchandising and industrial businesses.

Mr. Insull said that the National Electric Light Association is now launching a national campaign of goodwill advertising in an endeavor to educate the public that the utility business is their business. The public controls the rates, the service, the security issues and the valuation of the property, and is either directly or indirectly an investor in the utility. Then he asked in closing: Is the utility business not the public business?

ADDRESS OF E. K. HALL

E. K. Hall, vice-president American Telephone & Telegraph Company, then addressed the assembly in a speech that was replete with humor and able suggestions on how to make the public understand the true situation in the utility field. In describing how completely the life and business of every community is built around its utility service, Mr. Hall compared the utilities to the elevator service in the famous Woolworth Building in New York. He spoke of the beautiful architecture of this wonderful structure, but said that the value of the building as a business enterprise rested entirely upon the elevator service, and that without this it would be just a monument. Most communities do not realize how badly they need utility expansion and improvement, and practically all utility companies are now without the money to give the service the public wants in its own interests. This means that the utilities need more revenue in order to get more capital, and the only way this can be had is through better rates. But higher rates are hard to get. Why? Because the public says the service is not good enough to warrant increase in rates. The utility then determines to boost up the service and tells the public that it will, but finds that it cannot do so because it cannot get the money necessary. Hence the company is back where it started at the beginning of another form of vicious circle.

Mr. Hall then raised the question of what is the key to the situation, and said that the answer was easy. If the utility operators could wave a magic wand to solve their greatest need, they would have it produce a unanimous understanding on the part of the public, for if this were had it would immediately say to take care of the utility companies. But how can the public be made to understand? This is the key, and we have the knowledge and information to do it, and in fact have been trying to tell the public for some time, but the public does not understand because it does not believe us. In the case of the railroads, he said, they had to wait until the whole transportation system broke down before the public would believe there was not a "nigger in the woodpile."

Raising the question, then, of why the public does not believe us, Mr. Hall pointed out that the public viewpoint is entirely different from ours. He said that we did not get wise ourselves to what our job really is until the last four or five years. Prior to that time we thought that our job was to sell telephone instruments and electric light bulbs, but now we know that what we are really selling is service. He said that the manufacturers were partners in this lack of understanding, for they were pushing the business in order to sell more instruments and supplies. They wanted to make dynamos and sell them, but did not care whether they were used in giving service to the public afterward or not.

Furthermore, he said, the art of all of the public utility businesses is very young. No one visualized the field ahead very clearly. And through the development of the art mistakes were made. Many of the utilities put things over on the public and got themselves and the honest utilities as well in wrong. We have been paying the bills resulting from these mistakes ever since. Consequently, when regulation came it started with a hostile attitude. The public conception of regulation at the time it went into effect was (1) to see that no rates were excessive (and the public thought that all rates were excessive and we were not wise enough to explain they were not), (2) to prevent unjust discrimination, and (3) to prevent the waste, unsightliness and inconvenience of competitive utility systems.

Mr. Hall compared the position of the utilities when regulation thus came to what a similar situation would mean to a merchant if told that three of his customers were going to begin tomorrow to fix prices on all his goods for the rest of his life. Mr. Hall said this merchant would have a fit; in fact, he was not sure but it would kill him. Yet this is what the utilities have had to submit to.

Whatever reason there was to regulate the utilities downward and restrict their operations, he said, was taken care of in a few years, and completed a long time before the war. Then we had to stand by during the war and permit the very lifeblood of these businesses to be sapped. Profiteers were plentiful in every other line of business and the public had to put up with exorbitant prices all around without recourse, but not without resentment. Then when the utility companies asked for higher rates, the public immediately took the attitude that at least here is one fellow that won't get a chance to profiteer. In other words, the resentment at the real profiteers was taken out on the utilities, who were farthest from being profiteers.

Mr. Hall said that it takes a long time to change a lifetime of opinion, and this is the problem the utilities now face in changing the general public impression of the utility operators. He said we must patiently, intelligently and tactfully get the facts before these people during the next five years, and then forever keep the facts before them. It must be brought home to the public that it is through with its job of "spanking the utilities." They have been made to suffer in full for whatever transgressions they were guilty of. He commented that at last the public utilities in one state have awakened to their jobs. In Indiana, at least, they have all got together to talk a common language and to work together in this common problem of public relations.

If there is any utility company that is not now ready to play fair and square with the public, it is the job of the honest utilities to bring this one into line summarily. If we do not, the public will, and will punish the rest of us at the same time.

One of the problems of the utilities is to make the public see that the whole idea of regulation is moving into the second era. The punitive era, the era of

Four Fundamentals According to E. K. Hall

1. The interests of the public and utility companies are identical. Few people understand this. It means co-operation.
2. The business of the utilities is entirely different from that of unregulated corporations. There is no such thing in the public utility business as profits in the ordinary sense.
3. The only possible danger as to rates from the public point of view is that they may be made too low. If too high, the fact is easily seen, but if too low it reacts against the public interests. If there is any doubt about the rate, let the decision be made on the safe side.
4. The utilities must have good credit if they are to keep ahead of the growth of any community. Good credit is the result of a fair return on the investment, plus a margin for safety in case of adversity.

teaching the utilities to be good, has gone by and few companies are using any unfair practices now. The second era, or that of making and keeping the utility companies strong enough to do their work, is now here. This must be the era of co-operation between companies and public, the era of understanding with the removal of distrust. This is the era that we are coming into and there are many ways to hasten it as a reality.

To better public relations means to better public opinion of the utilities. This public opinion is the court of last resort, and we want it to know our problems and believe in us. The right conception of our job is to give service of the kind the public wants. But in trying to mold public opinion, Mr. Hall thought that we have not started near enough to the bottom of the situation, that we need to talk fundamentals and then the details will come easy. He considered that there were four fundamentals, upon which, if agreement between public and utilities could be secured, there would be the basis of rapid progress in the understanding of the public. His ideas of these fundamentals were as follows:

1. The interests of the public and utility companies are identical. Few people understand this. It means co-operation.

2. The business of the utilities is entirely different from that of unregulated corporations. There is no such thing in the public utility business as profits in the ordinary sense.

3. As to rates, the only possible danger there is from the public point of view is that they may be made too low. If they are too high this fact is easily seen, but if they are too low it takes the heart and flesh out of the business and reacts against the public interests. In any event the chance of crippling the utilities should not be taken, because this is against the public's own interests. If there is any doubt about the rate, let the decision be made on the safe side.

4. The utilities must have good credit if they are to keep ahead of the growth of any community. Good credit is the result of a fair return on the investment, plus margin enough so that people not already investors in the business, in looking over the company's securities with a view to investing, will see that the companies can stand a little adversity, that there is a little something over for safety.

HOW TO BETTER PUBLIC RELATIONS

Before making some suggestions as to how best to handle the problem of educating the public, Mr. Hall pointed out a few suggestions on how not to do it. Do not wait, he said, until you are up against it, until the only story you have to tell is a sad story, for this breeds suspicion. Do not try to get favorable public opinion until you have cleaned house and deserve it. Do not try to assign the task of informing the public to one man with that as his special job. No one man alone can accomplish much, and it is essential that every officer and every employee do a part. Do not leave the task to publicity alone. This is good if rightly conducted, but it must be supplemented by word of mouth and other means of education.

The place to begin the big task of inducing favorable public opinion is at home. It is impossible to accomplish much unless the whole organization family thoroughly understands and is ready by training and willing in mind to spread the truth. Another very important point is to study and proceed from the public point of view. We have not told the public what a task it is to give service, and it has no conception of the magnitude and intricacy of the work behind this service. It thinks that "it is a cinch."

Mr. Hall said that the public thinks the rates are too high because (and this is a commentary on the public) individuals think that if they were in the business they would make the rates too high. A difference of opinion also arises because the public thinks in terms of today, while the utility operators must think in terms of the future. The public will seek an advantage for today without regard for the result in the future. The problem of good relations is largely a question of mutual confidence. Mr. Hall contended that the public is 90 per cent on the square if it has the facts. The crank politician does not represent the public and it is part of our job to bring this fact into the public light. The public must also be taught to distinguish between the companies that are doing the fair thing and those that are not. The public does not have time to learn all of the details of our business, but good treatment and thoughtful consideration will go a long way toward making up for what lack of knowledge there will be.

There is a hazard in every business, continued Mr. Hall, which measures the amount that that business has to pay for money. The utility business is not subject to many of the hazards common in other lines. The principal hazard in the utility business is that it is run on such a small margin that an increase in operating expenses may wipe out the margin and put the company in difficulty before the machinery for changing the rate can be made to function.

Mr. Hall's final message to the utility men was to stop sobbing and apologizing. He said it is time to take the aggressive, that we are in a great service, that we have a real story to tell, and that we should tell it to employees and to the public and tell it now.

SPEAKERS AT THE EVENING SESSION

At the dinner in the evening Mayor Charles W. Jewett of Indianapolis spoke briefly. He said that the time had gone by when a man can stand on a dry goods box and deride the public utilities. Such a critic fails to appreciate how fundamentally necessary the service of the utilities is and he does not see that they cannot serve if they are financially crippled. The appreciation of the user of utility service will be advanced as he is brought to understand the significance of this service. He congratulated the utility men upon the organization of the Indiana association to work along this line, and he believed that it would result in great good to the people of the State as well as the utilities. He said that the public authorities and the utilities must work hand in hand for the development and progress of the communities.

Charles A. Munroe, president American Gas Association, spoke briefly on the fundamental necessity for understanding between public and companies. He said that in the beginning of regulation the reduced prices which were ordered enabled the companies to sell more of their product, and while it worked out in favor of the customer, it also was not altogether detrimental to the companies until the time came when operating costs began greatly to increase. People do not understand the fundamental factors of the utility business, and they do not believe that a utility is content to earn only 8 per cent; that in reality it must be earning more than this. This distrust must be overcome, for the welfare of cities and states is dependent on the financial welfare of their utilities. The utility services which were the luxuries of yesterday are the necessities of today. These companies cannot charge rates which will yield in excess of 8 per cent. On such rates they cannot develop the property out of earnings. The development of a utility must come from new money derived from the sale of securities, and this means that good credit must be assured.

Philip H. Gadsden, president American Electric Railway Association, then made the closing address of the meeting. This was published in abstract in the Jan. 15 issue of this paper, page 137.

ELECTION OF OFFICERS

During the afternoon a short business session was held, at which Thomas Donohue, secretary of the association, reported briefly on the work of the Indiana Committee on Public Utility Information, which has been the principal activity of the association during the past year. The reports of the committees on constitution and nomination of officers were also read and adopted. The following officers and members of the executive committee were elected for the following year:

President, Charles L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; first vice-president, S. E. Mulholland, vice-president Northern Indiana Gas & Electric Company, Ft. Wayne; second vice-president, F. J. Haas, vice-president and general manager Public Utilities Company, Evansville, Ind.; secretary, Marshall V. Robb, treasurer Wabash Valley Electric Company, Clinton; treasurer, Charles C. Perry, president Indianapolis Light & Heat Company. In addition to these officers the other members of the executive committee are Harry Reid, Louisville, Ky.; Frank O. Cuppy, Lafayette; Thomas Donohue, Lafayette; Fred Bryan, South Bend; Frank Wampler, Indianapolis, and C. L. Kirk, Indianapolis.

Two New Buses for San Francisco Municipal System

TWO new buses have just been received by the San Francisco Municipal Railway to supplement and serve as spares in connection with the bus service maintained by that system. The new cars, which were built by the Meister Machine Shop of Sacramento, are mounted on White automobile chassis provided with a 45-hp. motor. They have a seating capacity of eighteen and driver, and when ready for service weigh about 8,000 lb.

In general, the design and arrangement of the new buses is very similar to those which have been in service for some time and which were described in the ELECTRIC RAILWAY JOURNAL for Feb. 16, 1918. However, a number of minor improvements have been introduced in the new cars which are expected to make for somewhat better economy and service.

As the buses were found to average only about 5 to 6 miles per gallon of gasoline, the 24-gal. tank, provided on the earlier model buses, was considered too small and 35-gal. tanks were installed on the new buses, these being expected to serve for the entire day's run. The lamp hangers mounted on the rear of the old buses are replaced in the new design by lamps set flush with the body. This eliminates the danger and breakage resulting from boys on bicycles hanging on to the buses. The headlights have been moved back to the dashboard as a means of reducing maintenance.

No tire racks are provided on the new cars as it has not been found worth while to carry spares. The driver of the bus, working alone, requires so much time to change one of these large tires that it has been found more economical to send out a small service truck from the garage to make a change when necessary. However, less tire trouble is expected on the new cars because they are equipped with single 40-in. x 8-in. tires on the rear end, in which the rubber and fabric protection is such that punctures are very infrequent.

On the old plan the cost to equip one wheel with dual tires was as follows:

Two tires, 37 x 5 in. at $81.59	$163 18
Two tubes, 37 x 5 in. at $10.00	20 00
Total	$183 18

On the new plan, which is expected to be more economical, the cost to equip one wheel with single tire is as follows:

One tire, 40 x 8 in	$217 00
One tube, 40 x 8 in	25 00
Total	$242 00

Stockholm-Gothenburg Railroad to Be Electrified

THE Swedish Government has decided to electrify the Stockholm-Gothenburg division of the State Railways and has appropriated about $5,000,000 for the work to be done during 1921. The division is about 300 miles long and its electrification will require a total expenditure of about $25,000,000. Although the Riksgransen division, which is already electrified, operates at 15,000 volts, single-phase, it has not been definitely decided whether the new electrification will use alternating or direct current. In order to determine this and other factors which are unsettled a royal commission is now studying the railroad electrifications in this country. A. Granholm is director general of the Swedish State Railways, I. Ofverholm is chief electrical engineer and A. Enstrom is director of the Scientific Engineering Academy of Sweden.

Turning Seats on Passenger Trains

SHALL passengers be permitted to turn seats over and place their feet upon seat cushions? This question was one of those affecting the public's comfort brought up at a meeting of the operating staff of the Pennsylvania Railroad. The decision was as follows:

"When there is not a whole seat for every passenger, trainmen should see that seats are not turned over and an undue amount of space monopolized by any one passenger. To go further than this, however, and forbid the turning over of seats, when there is plenty of room, is unnecessary.

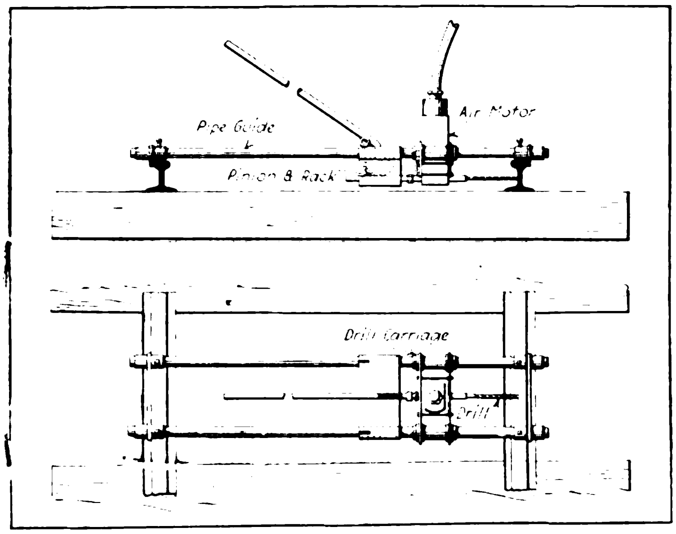
"After all passengers have been provided with seats, conductors will exercise their judgment in permitting the turning over of seats. Passengers should be required to exercise proper care to prevent the soiling of seats in placing their feet thereon."

A recent preliminary report of the Wisconsin Railroad Commission, covering the whole State, states that the electric railways, property and plants accounts in 1910 totaled $51,148,324 and in 1919 $84,714,942. The total operating revenues amounted to $8,823,996 in 1910 and to $15,784,993 in 1919.

Speeding Up Rail Bonding

Air-Operated Drills Receiving Power from Gas-Engine Driven Compressor and Mounted on Carriage Make Possible Bonding of Eighty Rails per Hour on Chicago, Milwaukee & St. Paul Railway

ON THE Chicago, Milwaukee & St. Paul Railway an expanded terminal type of bond was used which required two ⅞-in. holes through the web of the rail for each bond. The drilling was done with two air-operated drills, which received their power from a gas-engine-driven compressor. This compressor was an "Imperial" Ingersoll-Rand type on a four-tool compressor car, originally designed for operating tie tampers. Two air tanks, 16 in. x 48 in., were added to this outfit in order to secure a more uniform pressure and better engine operation. While the drills were operating an air pressure of 55 to 60 lb. was maintained at the reservoir of the compressor which furnished power for two drilling motors.



PIPE-CONSTRUCTED FRAME FOR DRILLING RAILS

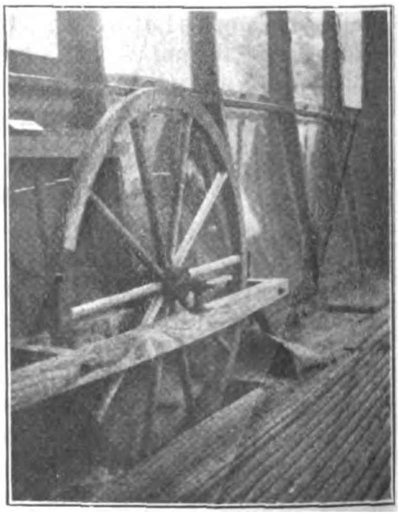
The drilling machines were close-quarter drill motors, mounted on a frame consisting of two 1¼-in. pipe guides extending from rail to rail. These were separated at the ends by two clamp plates of sufficient depth to prevent the frame from slipping over the head of the rail. The drill motor was supported between the guides by two transverse plates separated by sleeves which slide on the pipe guides. The drill feed consisted of a long lever with a gear segment acting on a rack. A downward pressure on the lever forces the whole carriage along as the drill bores through the web of the rail. The whole frame was supported on four set-screws, one in each corner, resting on the head of the rail and furnishing a means of adjustment and leveling the frame.

With an outfit of this type a hole can be bored in an average rail in about twenty-five seconds, but in harder steel it often takes forty to fifty seconds. Some difficulty was experienced with extremely hard steel in the rails. It was found necessary to use care in selecting the drill bits, otherwise there was considerable trouble due to breakage and difficulty in regrinding. One man was retained at the shops for regrinding drills, which operation required careful attention in order to secure bits which would give uniform diameter of holes.

The drill motors were connected to the compressor with a 50-ft. and a 75-ft. section of ¾-in. armored air hose. With this hose each drill could work on two joints for each movement of the compressor. To clear the track for train movements the air compressor was jacked up and rolled clear on skidways. The average bonding rate was about eighty per hour, and as many as 110 have been placed in an hour. The best record was 629 bonds in seven hours and twenty minutes' drilling time. The actual drilling time averaged about five and one-half hours per day, the lost time being due to going to and from work, clearing the track for trains, etc. This time would vary considerably with other working and traffic conditions. For one compressor the usual bonding crew consisted of twenty-one men, including the foreman, drillers, helpers and others required for the complete bonding operation.

Convenient Track Measuring Device

THE device illustrated herewith was used by an electric railway to check the track mileage of the system. An obsolete single-truck passenger car was used and the cone was turned from the tread of one of the wheels so as to give a flat surface. A wooden wheel mounted as shown in the illustration was fitted with a rubber tire and adjustments were made so that the circumference would measure exactly 10 ft. This wooden wheel was arranged to bear against the car wheel and be driven by it. By this arrangement the distance traveled by the circumference of the wooden wheel would be exactly equal to the track distance. The frame supporting the wooden wheel was weighted in order to increase the friction between the driving and the driven wheel. The axle of the wooden wheel was connected by a flexible shaft to a counting device taken from an old kilowatt-hour meter. Each revolution of the wooden wheel caused the first dial of the meter to make one revolution and as this represented 10 ft. results could be read directly. In order that there might be no tendency toward slipping between the car wheel and the track, the brushes were removed from the motor on that axle to which the measuring device was attached and the car was operated with one motor.



CONVENIENT TRACK MEASURING DEVICE

A check of the results obtained showed that on tangent track these were as close as 1 ft. in 5,000. Curved special work was measured with a tape, measurement being taken at the points of tangency of the layout. With this device it was found that results sufficiently accurate for the purpose desired were obtained.

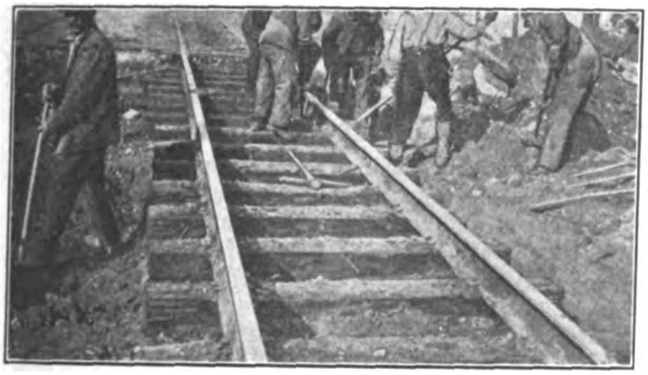
About 2,000 of the original white cedar ties laid in 1869 by the Chicago, Milwaukee & St. Paul Railway between North Milwaukee and Cedarburg are still in use today. For untreated ties this is an excellent record. For the first thirty-three years of service, or up to 1902, the ties did not have even the protection of tie plates.

22-Year-Old Track in Good Condition

Track Consisted of 72-Lb. T-Rail Laid on Michigan Hemlock Ties Which Had Been Pressure Treated with Creosote —Rail Also Showed Little Deterioration After This Long Service

BY W. L. WHITLOCK
Superintendent of Way the Denver (Col.) Tramway

WE RECENTLY had occasion to open up some track which was built in July, 1898, and were much impressed by the soundness of the ties and condition of the rail after twenty-two years of service. The track in question was a tangent double track, 3-ft. 6-in. gage, constructed for a distance of 7,700 ft. on Colfax Avenue, from Broadway to York Streets. It was laid with 5-in. x 8-in. x 6-ft. Michigan hemlock ties which had been pressure treated with creosote oil using 12.5 lb. per cubic foot. They were so soaked with oil that if stood on end the oil would run out. These were laid on 6 in. of pit-run river gravel ballast and concreted in up over the base of the rail. The 72-lb. T-rail, Lorain Section No. 331, was fastened to the ties with $\frac{9}{16}$-in. by 4½-in. cut track spikes and the joints completed with six-hole angle bars, 1-in. track bolts and tie plates. When installed the tie plates were pressed into the ties according to a template and the ties transported to the job with the plates in place. The four ridges on the plates helped to fasten them to the ties. The tie plates and bottom and sides of the rail were coated with asphalt paint as protection against the alkaline soil. The street was paved with asphalt, with basalt blocks on either side of the rails and vitrified brick nose blocks in the flangeway.



APPEARANCE OF TIES AND RAILS IN TWENTY-TWO-YEAR-OLD TRACK

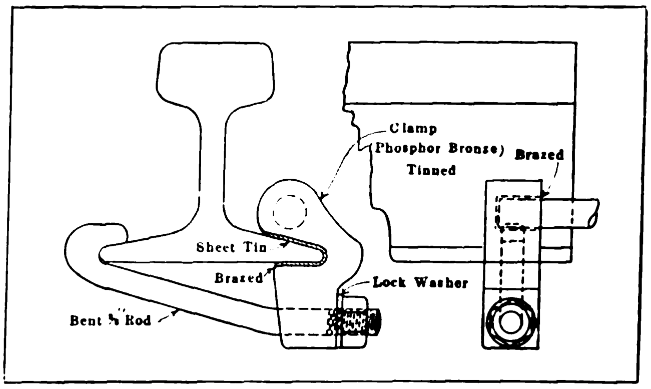
RAIL IN UNUSUALLY GOOD CONDITION CONSIDERING LENGTH OF SERVICE

Upon removal of the pavement it was found that the ties were soggy on the outside but sound in the heart. The tie plates were in excellent condition and the spikes had to be pulled out with claw bars. The rail was found to be in good condition except that the base had commenced to show signs of deterioration from rust. The head of the rail was measured with a micrometer at several points, ¼ in. back on the gage side, and it was found to be uniformly $1\frac{3}{32}$ in. thick, indicating a head wear of $\frac{5}{32}$ in. in twenty-two years.

This track is on one of the heaviest traveled lines of the Denver system. While the soil and climatic conditions in Denver are favorable to long track life, the condition of this work demonstrates that a track made with treated ties, tie plates, heavy rail and good waterproof paving pays in the end. It also brings to our attention the necessity of strict inspection during construction work.

Detachable Rail Bond

A TYPE of detachable rail bond shown in the accompanying illustration is being placed on the market by the National Electric Company, Charleston, W. Va. It consists of a phosphor bronze clamp coated with tin, which is gripped to the rail flange by a bent rod. A strip of block tin insures good contact between the rail and clamp and these latter are connected together with stranded copper cable. Clamps are furnished either with or without the cable as desired. The special features claimed for this clamp are its ease of installation and removal and the advantageous position afforded for the connecting cable close to the track and free from interference.



DETACHABLE TYPE OF RAIL BOND

Terminal Markings for Electrical Apparatus

THE American Engineering standards committee has under consideration the standardization of terminal marking for electrical apparatus and has designated the Electric Power Club as sponsor for this purpose. At the Brussels meeting of the International Electrotechnical Commission, held in March, 1920, some of the European delegates proposed a method for marking terminals for transformers and, as the American delegates suggested that it would be preferable to treat the more general subject of terminal markings for electrical apparatus consistently, they were requested to propose a systematic plan for the whole subject. It is hoped to secure agreement of all interested bodies on a general plan, which can be worked out to minimize confusion and insure uniformity.

Association News

Notice About the Banquet

THE speakers at the dinner to be held in Chicago on Feb. 10 will be as follows: President Philip H. Gadsden, Hon. John W. Weeks, former United States Senator from Massachusetts; Hon. James H. Wilkerson, former chairman Public Utilities Commission of Illinois, and Charles A. Leedy of the Youngstown *Telegram*. The dinner will be served at 7 p.m., preceded by a reception at 6:30. The tickets are $10 and the tables will seat ten each.

American Association Committee Appointments

FOLLOWING are the principal American Association committees (with the exception of the Committee of One Hundred) together with their respective memberships:

Committee on Company Membership—F. R. Coates, Toledo Railways & Light Company, Toledo, Ohio, chairman; Benjamin Adams, St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.; J. P. Barnes, Louisville (Ky.) Railway; H. F. Dicke, Utah Light & Traction Company, Salt Lake City, Utah; C. R. Ellicott, Westinghouse Air Brake Company, New York, N. Y.; L. E. Gould, Economy Electric Devices Company, Chicago, Ill.; C. A. Hall, Eastern Pennsylvania Railways, Pottsville, Pa.; E. B. Moore, Monongahela Valley Traction Company, Fairmont, W. Va.; H. H. Norris, ELECTRIC RAILWAY JOURNAL, New York, N. Y.; R. T. Sullivan, Tacoma Railway & Power Company, Tacoma, Wash.; E. M. Walker, Terre Haute Traction & Light Company, Terre Haute, Ind.; E. P. Waller, General Electric Company, Schenectady, N. Y.; E. F. Wickwire, Ohio Brass Company, Mansfield, Ohio.

Committee on Company Sections and Individual Membership—Martin Schreiber, Public Service Railway, Camden, N. J., chairman; H. H. Norris, ELECTRIC RAILWAY JOURNAL, New York, N. Y.; Charles C. Peirce, General Electric Company, Boston, Mass.

Committee on Constitution and By-Laws—Harlow C. Clark, Public Service Railway, Newark, N. J.; Thomas Casey, National Pneumatic Company, New York, N. Y.; Charles L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; Lucius S. Storrs, the Connecticut Company, New Haven, Conn.

Committee on Mail Pay—L. H. Palmer, United Railways & Electric Company, Baltimore Md.; Charles L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; G. K. Jeffries, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; R. A. Leussler, Omaha & Council Bluffs Street Railway, Omaha, Neb.; Louisville (Ky.) Railway; W. S. Rodger, Detroit (Mich.) United Railway; C. L. S. Tingley, American Railways, Philadelphia, Pa.

Committee on National Relations—Charles L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., chairman; H. G. Bradlee, Stone & Webster, Boston, Mass.; A. W. Brady, Union Traction Company of Indiana, Anderson, Ind.; Britton I. Budd, Metropolitan West Side Elevated Railway, Chicago, Ill.; C. D. Cass, Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa; Edwin C. Faber, Aurora, Elgin & Chicago Railroad, Aurora, Ill.; W. S. Rodger, Detroit (Mich.) United Railway; Lucius S. Storrs, the Connecticut Company, New Haven, Conn.; C. L. S. Tingley, American Railways, Philadelphia, Pa.

Committee on Publicity—Barron G. Collier, Barron G. Collier, Inc., New York, N. Y., chairman; C. B. Buchanan, Virginia Railway & Power Company, Richmond, Va., Britton I. Budd, Metropolitan West Side Elevated Railway, Chicago, Ill.; W. A. Draper, Cincinnati (Ohio) Traction Company; C. D. Emmons, United Railways & Electric Company, Baltimore. Md.; Horace Lowry, Twin City Rapid Transit Company, Minneapolis, Minn.; Lucius S. Storrs, the Connecticut Company, New Haven, Conn.

Committee on Subjects—J. D. Mortimer, the North American Company, New York, N. Y., chairman; W. G. Gove, Brooklyn Rapid Transit Company, Brooklyn, N. Y.; J. J. Landers, York (Pa.) Railways; J. J. Reynolds, Boston (Mass.) Elevated Railway; J. N. Shannahan, Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va.; J. J. Stanley, Cleveland (Ohio) Railway; R. P. Stevens, Republic Engineers, Inc., New York, N. Y.; Calvert Townley, Westinghouse Electric & Manufacturing Company, New York, N. Y.

Committee on Valuation—Martin Schreiber, Public Service Railway, Camden, N. J., chairman; Prof. H. C. Anderson, University of Michigan, Ann Arbor, Mich.; Cecil F. Elmes, Sanderson & Porter, Chicago, Ill.; Williston Fish, Chicago (Ill.) Surface Lines; G. W. Gillespie, Associated Gas & Electric Companies, Ithaca, N. Y.; J. H. Hanna, Capital Traction Company, Washington, D. C.; W. H. Maltbie, United Railways & Electric Company, Baltimore, Md.; W. H. Sawyer, E. W. Clark & Company Management Corporation, Columbus, Ohio.

Transportation Association Committees Commence Work

THE committee work of the Transportation & Traffic Association for 1921 is under way. The committee on personnel and training of transportation employees held the first meeting at association headquarters on Jan. 18. Among those present were J. P. Barnes, chairman, Louisville (Ky.) Railway; J. E. Wayne, York (Pa.) Railways; John Leeming, Chicago (Ill.) Surface Lines; J. F. Trazzare, Georgia Railway & Power Company, Atlanta, and J. K. Punderford, the Connecticut Company.

The report as planned for presentation at the 1921 convention will include a résumé of the recommendations of previous committees, in so far as such recommendations are not obsolete or unworkable according to present-day practice. This will be prepared by J. E. Wayne. Another part of the report will discuss the advantages that accrue to railways having employment bureaus under the jurisdiction of specially trained executives, together with physical tests and specifications for various jobs. J. F. Trazzare is responsible for this section. A syllabus of mental tests as used by some electric railways will also be included. This section is to be prepared under the direction of John Leeming. Another section which will be prepared under the supervision of Martin Schreiber will bear on the value of the company section as a means of educating employees.

Additional T. & T. Association Appointments

SUPPLEMENTING the list of committee appointments of the Transportation & Traffic Association printed in the issue of this paper for Dec. 25, 1920, page 1297, the following list is given, including also the personnel of joint committees on which this association is represented:

Committee on Merchandising of Transportation—Colonel J. H. Alexander, Cleveland (Ohio) Railway, chairman; W. H. Boyce, Beaver Valley Traction Company, New Brighton, Pa.; F. L. Butler, Winnipeg (Man.) Electric Railway; H. C. Clark, Public Service Railway, Newark, N. J.; F. R. Coates, Toledo Railways & Light Company, Toledo, Ohio; A. H. Ferrandou, Washington Railway & Electric Company, Washington, D. C.; B. W. Frauenthal, United Railways of St. Louis (Mo.); A. L. Kempster, New Orleans Railway & Light Company, New Orleans, La.; M. B. Lambert, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; A. Stuart Pratt, Stone & Webster Management Corporation, Boston, Mass.; S. L. Vaughan, Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.

Committee on Traffic Regulation—H. B. Flowers, United Railways & Electric Company, Baltimore, Md., chairman; F. R. Cogswell, Pittsburgh (Pa.) Railways; R. F. Kelker, Jr., Board of Supervising Engineers, Chicago, Ill.; W. H. Maltbie, United Railways & Electric Company, Baltimore, Md.; H. B. Potter, Boston (Mass.) Elevated Railway; Fielder Sanders, Street Railroad Commissioner, Cleveland, Ohio; Paul E. Wilson, Cleveland (Ohio) Railway.

Committee on Personnel and Training of Transportation Employees—J. P. Barnes, Louisville (Ky.) Railway, chairman: F. G. Buffe, Kansas City (Mo.) Railways; F. D. Burpee, Ottawa (Ont.) Electric Railway; John Leeming, Chicago (Ill.) Surface Lines; Martin Schreiber, Public Service Railway, Camden, N. J.; R. P. Stevens, Republic Engineers, Inc., New York, N. Y.; J. F. Trazzare, Georgia Railway & Power Company, Atlanta, Ga.; J. E. Wayne, York (Pa.) Railways.

Joint Committee on Economics of Schedules (T. & T. and Accountants)—(T. & T. members) Edward Dana, Boston (Mass.) Elevated Railway, chairman; Donald Goodrich, Twin City Rapid Transit Company, Minneapolis, Minn.; E. H. Ives, Detroit (Mich.) United Railway; H. C. Moser, Fifth Avenue Coach Company, New York, N. Y.; Samuel Riddle, Louisville (Ky.) Railway; J. A. Stoll, United Railways & Electric Company, Baltimore, Md. (Accountant members)—A. G. Neal, Washington Railway & Electric Company, Washington, D. C., co-chairman; C. B. Jackson, Eastern Massachusetts Street Railway, Boston, Mass.; D. J. Strouse, Twin City Rapid Transit Company, Minneapolis, Minn.; J. M. Campbell, Atlantic City & Shore Railroad, Atlantic City, N. J.

Joint Committee on Express and Freight Traffic Promotion and Costs (T. & T. and Accountants)—(T. & T. members) F. W. Coen, Lake Shore Electric Railway, Sandusky, Ohio, chairman; T. G. Brabston, Birmingham Railway, Light & Power Company, Birmingham, Ala.; W. P. Bristol, the Connecticut Company, Hartford, Conn.; J. H. Crall, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; R. D. Hood, Massachusetts Northeastern Street Railway, Haverhill, Mass.; F. D. Norveil, Union Traction Company of Indiana, Anderson, Ind.; W. S. Rodger, Detroit (Mich.) United Railway; T. H. Stoffel, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; C. E. Thompson, Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.; A. F. Van Deinse, Columbus, Delaware & Marion Electric Company, Marion, Ohio. (Accountant members) L. T. Hixon, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; A. R. Baxter, Indianapolis & Cincinnati Traction Company, Rushville, Ind.; L. E. Lippitt, Auburn & Syracuse Electric Railroad Company, Auburn, N. Y.; C. K. Savery, the Connecticut Company, New Haven, Conn.; W. K. Zinmeister, Rochester & Syracuse Railroad, Syracuse, N. Y.

Joint Committee on Safety Work (T. & T. and Claims)—(T. & T. members) E. C. Spring, Lehigh Valley Transit Company, Allentown, Pa., chairman; W. H. Boyce, Beaver Valley Traction Company, New Brighton, Pa.; G. E. Deibert, Georgia Railway & Power Company, Atlanta, Ga.; C. B. Scott, Chicago Edison Company, Chicago, Ill.; E. M. Walker, Terre Haute Traction & Light Company, Terre Haute, Ind. (Claims members) R. E. McDougall, New York & Harlem Railroad, New York, N. Y., co-chairman; H. K. Bennett, Eastern Massachusetts Street Railway, Boston, Mass.; H. V. Drown, Public Service Railway, Newark, N. J.; C. G. Rice, Pittsburgh (Pa.) Railways; W. F. Weh, Cleveland (Ohio) Railway.

Progress in Highway Traffic Regulation

A DECLARATION of principles to serve as a basis for state highway traffic regulation was adopted in Washington Jan. 12 after a conference attended by representatives of nineteen interested national organizations, including the American Electric Railway Association. In addition, a complete uniform traffic bill was drafted. This draft now goes to the individual associations for approval or suggested changes. Neither the act nor the statement of principles conflicts with the code of traffic principles adopted by the American Electric Railway Association in October.

Among the other associations represented were the American Automobile Association, the American Railway Association, the International Association of Chiefs of Police, the National Safety Council, the National Workmen's Compensation Bureau, the Tractor and Thresher Department of the National Implement and Vehicle Association, etc.

Letter to the Editors

The Field of the Trackless Trolley

MOUNT VERNON, N. Y., Jan. 15, 1921.

To the Editors:

As you have pointed out in recent issues, the British and continental operators are far ahead of American operators in the exploitation of the trackless trolley, which J. B. Hamilton, general manager Leeds Corporation Tramways, has felicitously termed "putting down a tramway on the installment plan." Nevertheless, in spite of the more favorable conditions abroad, the trackless trolley has not made any perceptible dent upon the foreign street railway, and up to the sensational postwar advances in motor fuel it had not thrown much of a scare into the gasoline motor bus. In analyzing the causes for this, one must conclude that a primary one is that most of the trackless trolley pioneering was carried on by firms which did not manufacture standard railway motor and control equipment. They offered the electric railway man apparatus which was decidedly different from the head down to the feet, so that the argument of interchangeability, standardization and minimum parts as compared with gasoline buses lost much of its force.

It is in apparent recognition of the equipment factors set forth that one of our large American railway motor and control manufacturers in bidding upon an Asiatic installation, which is already making a success of the trackless trolley in narrow streets, laid out the following arrangement per bus:

One standard 25-hp. or 40-hp. railway motor without gear, pinion or gear case and with the axle-cap brackets cut off, to be suspended on the chassis of the automobile truck with the armature shaft connected to the driving shaft with a universal joint and worm gear reduction.

One rheostatic controller.

One wooden trolley pole with the base mounted in a socket adjacent to the motorman and with two contacts connected by flexible cable to the controller, so designed that the pole can be raised and lowered or swung to one side of the car by a handle of about the same size as those used for hand operation of car doors. Such a pole would be adapted for use on trolley wires carried 14 ft. to 18 ft. above the ground.

Although, as noted, the foregoing was embodied in a bid for a foreign city, there is no reason why the same scheme would not be satisfactory for American conditions if it can be shown that the trackless trolley is more desirable and more economical than either the trackway or gasoline. Let us see where it would fit in.

In his recently completed* studies on "The Place of the Bus" the writer set forth the conditions where motor bus operation was preferable to the electric trackway, whether such operation was intended to be self-sustaining or simply to minimize the losses incident to operating the "suckers" and byways of a co-ordinated system of mass transportation. Emphasis was also placed upon the fact that the gasoline bus can be shifted around from route to route as traffic conditions change and that it can serve also to reinforce the service on standard trolley routes by making use of parallel streets or of short cuts between workplaces and home. For any shifting conditions, consequently, we must grant that the self-contained power vehicle stands in a class by itself. Of course, there is sometimes a fighting chance for the storage battery bus where power is to be had at extremely low prices and where the question of schedule speed is not a factor in building up or meeting traffic, but on the whole the gas bus is the right bus for fluctuating services.

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*See ELECTRIC RAILWAY JOURNAL for Feb. 28, April 3, April 24, May 29, July 3, July 31, 1920.

With regard to extensions of long-established car routes, the choice between gas bus and trolley bus obviously should depend upon the density or rather the thinness of the patronage. Such service might well begin with the gas bus at long intervals, continue with the trackless trolley at shorter intervals and conclude with the orthodox article. It is always well to bear in mind that the absolutely foot-loose character of the self-contained motor bus insures the operator against any heavy loss of investment. There is no track to pull up, no wires to take down nor even a carhouse to remove, because a gas bus does not need a wholly special building for its retiring place. The buses themselves will always find use in some other place.

It will occur to many, in view of the staggering cost of track construction, track upkeep and paving taxation, that the trackless trolley ought to have a large field in future city transportation over paved streets. There is reason to believe that such a service with moderate traffic would cost less than either track or gas, be quicker and safer than gas buses because of the possibility of using the labor-saving and door-step interlocking devices of modern electric cars and be more acceptable to the rider because of cleaner, brighter and cheaper service.

The fly in this ointment is the retention of poles and overhead wires. It having been demonstrated by the motor bus that these permanent obstructions are no longer essential to transportation over city streets, we may expect the same line of objection to operating trackless trolleys through residential, and even business, streets as in the past when there was no other alternative than the prohibitive conduit system. There is logic in the assertion of the civic welfare man that at least a part of a municipal transportation system should be fluid so that the community will not be forever compelled to grow along the routes made to fit conditions now obsolescent. Hence, public sentiment, as well as relative construction cost and fares, is bound to determine the character of additional transport facilities, even if the trackless trolley is cheaper and safer.

But no matter what happens in city practice, any worth-while trackless trolley has a large opportunity in the conversion of existing highway trolleys and a fair chance for any new intertown transportation which does not make use of a railed right-of-way. Now it may sound fantastic to talk of replacing the old, reliable track trolley with the trackless breed, yet consider the change in its status that is being wrought by the development of the private automobile and the motor truck.

Fifteen to twenty years ago thousands of miles of single-track trolley lines were built alongside of dirt highways in New England and the Middle Atlantic States especially, whereas the Central and Western States were enabled, because of cheaper land, to build roads on private right-of-way. In the course of time part of this highway trolley mileage has been converted to suburban and city trackage through the growth of towns. The greater part, of course, is still in open country, but instead of forming part of a quiet and unpaved dirtway, the trolley strip is frequently the only sign left of the old days. The rest of the road is paved and scores or hundreds of rubber-tired motor vehicles are to be seen for every trolley car.

As the pressure of automotive traffic on these paved highways increases, longing eyes are cast by their users upon the trolley trail, constituting perhaps one-fourth to one-third of the total highway width. In time the voices belonging to those eyes will begin to clamor for more elbow room (to mix the tropes), and if they cannot get it through the costly widening process they will naturally demand that the trolley strip be paved too.

Here is where the highway trolley's cup of troubles, already numerous enough from loss of traffic to private and jitney automobiles, will be filled to overflowing if it attempts to do business in the same old way. Its track upkeep would rise enormously in any case once the track was paved, not to mention the cost of changes in alignment. Even worse would be the later delays due to slow-moving motor trucks settling themselves comfortably between the rails, thereby adding to the schedule losses already suffered in passing through towns and villages and making "meets" on the single-track sections harder than before.

What other way out will there be for the highway trolley so circumstanced than to convert itself to a trackless trolley? At the present selling price of rails and copper, new or old, it may be able to gather almost enough money to buy the necessary buses and to add another wire to the overhead. Its energy consumption will be decreased instead of increased, because a modern bus will weigh wonderfully less than the old-time trolleys found in highway service. Its roadway upkeep tax and a bit added for the multiple overhead should not total more than its track and signal expenses. Yet even if the power and maintenance items should be more, they will be offset many times over by the enormously increased flexibility of the service, for there will be none of the delays and accident possibilities that can be minimized but never entirely eliminated in single-track operation. This same flexibility in passing an opposing trackless trolley bus naturally applies also to going past or around any other vehicle. It follows that trackless trolley schedules can be made faster and more reliable than the single-track line of the past, especially as time will be also gained in passing through intervening communities. Obviously, faster schedules and elimination of waits at sidings will improve public patronage.

A vitally important corollary of such trackless trolley operation is that one-man car operation with approved safety appliances is feasible. Vehicle for vehicle, this would naturally cut down the platform expense. In some cases the wiser policy would be to shorten the headway to build up traffic.

In the case of new transportation facilities over paved country roads the problem is not so clear, because no existing investment or franchise is to be conserved and because the self-contained bus cannot be ignored wherever the amount of traffic to be expected is either small or uncertain. We must figure individually the over-all cost of each kind of service, bearing in mind that it is up to us to determine that critical point of traffic density where the higher operating cost of the gas bus is no longer justified by its unlimited flexibility. And as the same Mr. Hamilton whom I quoted earlier is the proud operator of track, trackless and gasoline transports, I may quote also him at the conclusion of this letter as saying that there is a place for each and every one of these in accordance with the density and permanence of the traffic to be carried. WALTER JACKSON.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Transportation Area Planned

Massachusetts Commission Is Looking Well Ahead for the Needs of Metropolitan Boston

That the Boston (Mass.) Elevated Railway take over the Revere and Chelsea line of the Eastern Massachusetts Street Railway for the purpose of improving transportation and bringing about a 10-cent fare between Revere and Boston, as well as Boston and Revere Beach, is recommended by the Public Utilities Commission in a report filed with the Legislature. The fare now from Boston to Revere is 15 cents, and from Boston to Chelsea 10 cents, with no transfers at the Boston end.

EXTEND EAST BOSTON TUNNEL

It is also suggested by the commission that the East Boston Tunnel be extended to Maverick Square or possibly to Central Square, East Boston, and that five-car multiple trains be operated through the tunnel. To extend the tunnel to Central Square would cost something like $2,953,000, it is estimated.

The commission also suggests the possibility of electrifying the line of the Boston, Revere Beach & Lynn Railroad, and by operating trains through the tunnel, under the harbor, secure connection with the rapid transit facilities of Greater Boston.

The work of consolidating the Boston Elevated and Eastern Massachusetts lines, the department believes, could be undertaken through the creation of a transportation district. The investment cost of the Eastern Massachusetts lines in the communities in question was $2,618,000. It is believed that the Boston Elevated Railway could handle the present business of the Eastern Massachusetts Street Railway in Chelsea and Revere without material loss.

LOOKING TOWARD THE FUTURE

One of the big obstacles to the plan, says the report, is the presence of draw bridges at Meridian Street, East Boston, and over the Mystic and Charles Rivers in Charlestown. The average number of openings a day is fifty-six on the three combined. It is because of this difficulty that the extension of the tunnel to Chelsea was suggested.

Continuing its report, the commission says:

> The extension of the East Boston Tunnel would harmonize with the future development of the rapid transit facilities for the district north of Boston and would prepare the way for the next step, which would probably be the further extension of the tunnel under Meridian Street and Chelsea Creek to Broadway in Chelsea, a total extension from Maverick Square of about 1½ miles. An independent tunnel from Boston to Chelsea as suggested would be about a mile longer.
>
> When the capacity of the tunnel as above extended is reached the electrification and extension of the Boston, Revere Beach & Lynn Railroad under the harbor to a connection with the rapid transit system in Boston would then care for all the traffic from Revere Beach and Boston and would relieve the line through Broadway in Revere and Chelsea by connecting with the lines now operated by the Eastern Massachusetts Street Railway in Revere and Beach Streets and in Winthrop Avenue, Revere, and in Bennington Street, East Boston.
>
> This may appear to be a long look ahead, but it would seem wise to measure any proposed development not only by its probable results in the near future, but also by how it would harmonize with a general plan to deal with the conditions which are likely to arise from the growth and development of communities some years hence.

The report states that the consolidation of the lines of the two companies is the most appropriate method of meeting the situation. In conclusion the report says:

> There is no doubt that the orderly development of the Metropolitan street railway system requires that such a consolidation as this should be under the Elevated system and that it is only in this manner that the complaints of the present can be met and the best results can be obtained for the future.

Legislative Relief Sought in California

The Railroad Commission of California will ask the State Legislature, which convened on Jan. 3, to repeal the law requiring electric railways to pave the portions of the streets which they use, according to William Clayton, vice-president and general manager of the San Diego Electric Railway. Mr. Clayton made the statement to the heads of various San Diego civic organizations at a luncheon, at which he explained the problems confronting the electric railways and asked the support of the organizations for the repeal of the law. Should the Legislature pass the bill, electric railways would not be relieved from paving obligations, Mr. Clayton explained, but the municipalities concerned would be enabled to do so by vote of the people.

Mr. Clayton told the business men that the company needed $3,000,000 to $4,000,000 for reconstruction during the next four years, but that no profits are being made, therefore no bonds can be issued. The only money available is the sinking fund and the depreciation fund. Those at the luncheon, representing the chamber of commerce and other organizations, pledged their support to help bring about a solution of the railway's problems.

The present California law requires electric railways to lay and maintain paving between tracks and 2 ft. on each side, and pay to the city a franchise tax of 2 per cent of the gross revenue. Mr. Clayton attacked the franchise tax as unjust, as it is passed on to the persons who ride the cars.

Philadelphia May Reduce

Mr. Mitten, Seeing Wage Cut Coming, Counsels Thrift as Means to Painless Readjustment

"I hope," said Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, in addressing the employees at the annual convention of the Co-operative Welfare Association on Jan. 13, "that as the cost of those things you buy go down, you will reduce your expenses of living proportionately, because we hear that Detroit and Cleveland, which are two of the cities upon which we base our wage rate, are planning reductions, so that in the not far distant future our general committee will have to take that subject up and make such adjustments in reductions as they made in advances, when wages were increased in those cities. If you will only take advantage of the decreasing costs of the things you buy, so that you may cut your living costs down while you are still enjoying the higher wage, it will be a very much easier adjustment to make."

WELFARE ASSOCIATION PROSPERS

At the annual convention C. Edward Hendrickson, department of rolling stock and buildings, was elected president, succeeding William R. Smith. Addresses were made by both gentlemen, as well as by Mrs. Rudolph Blankenburg, W. J. Montgomery, member of the executive committee of the company; President T. E. Mitten and Miss L. M. Roadifer (Miss Safety First).

The records showed that 9,567 employees, or 99.71 per cent, were members of the association. The total subscribers to the saving fund are 7,461 or 79.43 per cent. The annual amount of subscriptions to the saving fund is $1,116,596. About a year ago the company distributed cards on which the men were requested to furnish helpful suggestions. Of those received 300 were considered valuable and more than 30 per cent of them have been adopted.

In the welfare association 118 death benefits of $1,000 each have been paid, and during the twenty-eight months since the association was organized the number of benefits so paid has been 302. Of sick benefits there have been 2,984, or $136,000 in money paid out. There are 114 pensions at $40 a month, to men who had served twenty-five years or are more than sixty-five years of age and unable to perform service. Under the original arrangement the men contributed $1 a month as dues to the association and the company the same sum per man. Last year the company doubled its subscription and this year it will pay $2 per man.

Service at Cost Suggested in Detroit

An Ordinance Along New Lines Will Be Submitted to the Voters at the April Election

Clarence E. Wilcox, Corporation Counsel of Detroit, Mich., has been served by Attorney Stevenson with a copy of an ordinance which the Detroit United Railway proposes to submit to the people at the April election with a view to solving the present railway problem. The ordinance was served as required by the city charter. It embodies parts of plans such as are in effect in Cleveland, and is practically a service-at-cost agreement.

AFTER the ordinance has been approved it will be printed and circulated for signatures. When the requisite number of signatures has been secured the ordinance will go to the Common Council with the request that it be submitted to the voters at the April election for their consideration.

Certain provisions as set forth in the recent proposal to lease the lines to the city are included in the ordinance. The sinking fund clause, which would provide for the accumulation of a sufficient sum to pay for the lines at the end of thirty years and which was opposed by the Mayor and the Street Railway Commission, is included. It provides that 2 per cent shall be taken from the revenues derived from the operation of the cars, to be placed in the sinking fund.

IMPORTANT PROVISIONS OF ORDINANCE

A summary of the important provisions of the ordinance follows:

> The city lines are to be operated by a separate company—Detroit Service-At-Cost Railway.
>
> All existing franchises and rights in the city are to be surrendered except for one or two short lines.
>
> As the city limits are extended from time to time within a larger territory defined in the ordinance the railway lines in the annexed territory come under the ordinance and all franchise and rights-of-way therein except those above mentioned are surrendered.
>
> The rates of fare are to continue as they may be on the day on which the ordinance is voted upon until an inventory and appraisal and audit can be completed. The rates are then to be fixed so as to pay all expenses, costs and charges which the Interstate Commerce Commission in its system of accounts for street railways recognizes as proper, and also such expenses, costs and charges as the city under the ordinance may require the company to incur and pay. In addition the company is to receive 6 per cent per annum on the value of its property used or useful in the public service. The maximum value of the property which was proposed to be transferred by the agreement with the city, of March 17, 1919, is limited to $31,500,000. The rates will go up or down from time to time by increments of one-half cent as conditions may require.

The value of the property and other questions are to be determined under a board of arbitrators.

Extensions are to be built and additional cars provided to any extent that may be directed by the Common Council subject to conditions as to purchase if built within the last ten years. If the company fails to proceed with due diligence and faithful endeavor it loses the 6 per cent until it makes the failure good.

Any municipal lines—subways, elevated or surface—may be required by the city to be equipped and operated by the company, or the company may be required to purchase any surface lines, or if the city operates the municipal lines the company may be required to exchange transfers or cars — that is, cars may be routed over both municipal and company lines. All crossings of company tracks by municipal tracks are to be constructed by the company and the cost paid as determined by the arbitrators.

The routing of cars, frequency of service, heating and ventilation of cars and all similar matters are to be prescribed by the Common Council.

CITY TO HAVE VOICE IN AGREEMENTS

The city is to have a voice in all future agreements with motormen and conductors as to wages and working conditions.

The city has the right to buy the property at the value shown by the inventory and appraisal at the end of any year. The city also has the right at the end of five years, or of any year thereafter, to lease the property at a rental of 6 per cent on the value shown on the inventory and appraisal at the end of such year, the city maintaining the property during the lease, which must run for the balance of the ordinance term—that term being not more than thirty years—but may run for any lawful longer term, at the option of the city, but not exceeding ninety-nine years, and city has right to assign lease or sublet the leased property.

A sinking fund of 2 per cent on the value of the property is to be invested each year by the commissioners in either city or company bonds. If the city purchase the railway payment may be made by converting the sinking fund into cash and turning the cash over to the company and paying the difference.

A budget is required to be submitted by the company to the Board of Street Railway Commissioners early in February of each year.

The City Comptroller and the City Treasurer are to be members of the board of directors of the company.

Mortgages now on the railway cannot be renewed or extended or new mortgages put on without separating the city lines from the lines outside the city nor can all new mortgages on the city lines together exceed 80 per cent of the value fixed by the board of arbitrators, and all mortgages must be payable at any time the city purchases the system.

In 1919 the value of the Detroit United Railway property, then proposed to be purchased by the city, was fixed at $31,500,000—a figure which the company maintains is well under the actual value of the property. Under the initiative ordinance the price to be paid for the same property cannot exceed this sum, but may be less if the property is found to be worth less.

New York Commission Counsels Care

Regulative Body Thinks Haste Should Be Made Slowly in Enactment of Service-at-Cost Measures

Detailed statements in the body of the report of the Public Service Commission for the Second District of New York taken from its general recommendations to the Legislature indicate that increased rates on nearly all the electric railroads in the State have been required during the past two years. Many of the companies have received more than one increase. The commission thinks that on the whole the public response to the necessities of the railroads for additional revenues has been characterized by fairness and good sense.

NATURALLY, says the commission, serious difficulty has been experienced in those municipalities which have contracts with local traction companies legally limiting the rates of fare to levels which the utilities have found to be unprofitable. Many of the communities have waived such limitations and thus conferred jurisdiction upon the commission. In consequence of the situation so presented the commission again urges that it be clothed with such measure of power over such rates as is still possessed by the Legislature. The commission continues to find embarrassment in requiring a full measure of service from railroads, as to which it lacks the power to regulate rates.

In general the commission finds the financial condition of this class of properties far from satisfactory. In the case particularly of suburban and interurban roads the very general use of the private automobile has been found to be an exceedingly grave factor. While this competition also affects the urban roads, its effect upon that class of traffic is much less marked. The commission says:

> Too great generalization should not be indulged in when remedies for existing conditions are sought. It is interesting to note that at its next midyear conference the American Electric Railway Association intends to centralize its attention on electric railway financing, including such features as the proper proportion of capital securities which may be represented by interest bearing debt, and the disadvantage of the present large degree of absentee ownership and control. Individual management, enterprise and efficiency, and the acquisition of the confidence of patrons in the honesty and fairness of business methods, are as important in their results in the public utility field as they are in other channels of commercial endeavor.

Of the service-at-cost plan the commission says:

> Some of the cities have given much study to what is termed service-at-cost plans for urban service, the general design being to regulate fares by an agreement between

> the utility and the city by virtue of which the rates will be expected to change automatically in agreement with the varying income over and above costs of operation, the correctness of the accounting being attempted to be assured by the participation of the city authorities in the management.
>
> This would mean in large degree at least the substitution of so-called automatic regulation for that which is now administered by the commission. It is understood that legislation designed to enlarge the corporate powers of the municipalities as to permit their participation in such plans will be presented to the coming session of the Legislature and that the railroad corporations whose rights are involved are unanimously in favor of such legislation.
>
> While the commission has no inclination to oppose the exercise by the communities of a large measure of home rule with respect to their local utilities we respectfully suggest that so important a departure from a long established policy of regulation of these utilities as may be involved in the proposed legislation should not be adopted without the most careful scrutiny.

The commission recommends that its powers and functions with reference to auto bus transportation be more clearly stated and defined.

Increased fares and heavier traffic, says the commission, were not sufficient to do more than bring the consolidated income statement of the electric railways for 1919 down to a net loss somewhat smaller than for 1918. Expenses increased in but very little greater proportion than revenues and the actual increase is less, so that net operating revenue was 12.8 per cent greater for 1919 than for 1918. Taxes were 8.2 per cent greater, but operating income shows a 15.3 per cent increase over 1918. The gross income, however, was not sufficient to meet interest charges and for the second time in fourteen years the electric roads as a whole show a net deficit, which for 1919 amounts to nearly $3,000,000. The car miles decreased to about 98,000,000, the lowest figure since 1912, but the number of passengers carried increased 713,000,000, the greatest number ever reported. On this point the commission says:

> Of course the exact meaning of this last figure is rather indefinite as a measure of traffic, since it depends on the method of fare collection to some extent, as well as on the actual number of passengers. For example, the introduction of the zone system where there had previously been a single fare might result in two or more passengers being reported for each passenger traveling two or more zones, where previously only one would have been reported. It is not believed, however, from a general knowledge of the tariffs which have been filed with the commission, that zoning accounts for a very considerable part of the increase shown in passengers carried.

The decrease in electric railway mileage between 1918 and 1919 was principally due to abandonment of operation by the Huntington Railroad, which formerly had about 19 miles of first track. The mileage given is, as in the case of steam railroads, only that within New York State, excluding the New York City Line within the jurisdiction of the first district commission, and should not be compared with the revenues, expenses, traffic statistics, etc., which are for the entire operation for the roads reported. No attempt has been made to segregate accounts by state lines.

Only about 11 per cent of the mileage of electric roads reporting to this commission is outside of the State of New York.

Cleveland Seeks Way for Improvements

Company Would Sell Stock at a Discount to Raise Funds for the Carrying Out of New Work

Amendment of the Taylor service-at-cost franchise so as to permit financing through the sale of new stock at less than its par value has been asked of City Council by the Cleveland (Ohio) Railway. The request was made by John J. Stanley, president of the company. In a letter transmitted to Council through Fielder Sanders, City Street Railway Commissioner, Mr. Stanley asks that the company be permitted to sell $3,000,000, par value, of its stock at not less than $80 a share, with the understanding that the difference between the amount at which each share of stock is sold and its par value shall be amortized out of earnings.

CLEVELAND Railway stock has been selling on the market at Cleveland for around $92 a share ever since Cleveland voters, in August, refused to ratify an amendment to the franchise that would have permitted the company to pay dividends of 7 per cent instead of 6 per cent. A provision in the present franchise forbids the sale of stock at less than par.

The City Council is going to hold public hearings on the company's request for authorization of this new method of financing. Company directors have already approved the plan. If the stock is sold at $80, the return to buyers will be 7½ per cent, or ½ per cent in excess of the rate refused the company by the voters in August.

Mr. Stanley says that if the Council permits the amendment the company will immediately purchase fifty new motor cars and fifty new trailers at a cost of about $930,000, will extend its tracks in several of the outlying sections of the city, will build new terminal loops for a number of lines, and will erect new operation stations for the E. Thirtieth, E. Seventy-ninth, Kinsman Road and Cedar Road lines, and will also construct two additional substations.

A part of Mr. Stanley's letter to the Council follows:

> You know as well as I know the present financial condition of this company and of general business. You know that additional tracks, cars, motors, buildings, power equipment and other property are needed. You know that the earnings of the company, at the present rate of fare and at present costs, will not provide a surplus, and that, if there were a surplus, it could not be used for the acquisition of new property.
>
> New property must be paid for by new capital. This means that we must sell more capital stock. Our franchise provides that we must sell it at not less than par and limits the rate of dividend to 6 per cent. You know that we have tried sincerely and earnestly to sell stock in order to raise the money we need—tried in vain.
>
> A year and a half ago I asked the Council to permit us to raise the rate of interest to our stockholders to 7 per cent. The Council declined to do so. The Mayor suggested that the request be submitted to arbitration. A board of arbitration was selected and decided that my request ought to be granted. The Council, it is true, passed an ordinance, but at a referendum on Aug. 10 the amendment was voted down.
>
> It would be useless for us to ask the Council again to amend the franchise so as to permit the payment of 7 per cent or any higher rate on our stock. A rate lower than 7 per cent would not help us.
>
> On many occasions since the referendum you and I have conferred in regard to ways and means of obtaining new capital. No way satisfactory to both of us seemed feasible. Last Saturday (Jan. 8) it was suggested that a franchise amendment be passed that would let us sell some part of our 6 per cent stock at less than par. You seemed to think well of the suggestion and said you would recommend it to the Council. I promised you that I would call a meeting of the company's directors at once and submit it to them for their consideration and advice. They met on Monday morning (Jan. 11).
>
> Skeleton resolutions explaining the plan more fully than I have explained it in this letter were submitted to the directors. They approved the plan. They said that $3,000,000 of stock could not be sold at more than 85, possibly it would have to be sold at 80, and that the amendment ought to permit the sale of that amount at 80. A stockholder who buys our 6 per cent stock at 80 will receive 7½ per cent on his investment in the stock so purchased. This is not an unreasonable rate. It is less than the market value of money at this time.
>
> I request, therefore, that you ask the Council to amend the franchise so as to authorize the sale of $3,000,000 of stock at not less than $80 per share for the purposes and on the conditions stated in the plan that was approved by the directors. Of course, all sections of the franchise that relate to the sale of stock and to the rate of interest should be amended, if the Council approves the plan.
>
> Please explain to the Council that this is not a proposition to permit a higher rate of interest than 6 per cent on the capital stock now outstanding, nor to sell at less than par more than the $3,000,000 of stock that should be sold immediately in order to enable the company to get money to pay for the extensions, betterments and other improvements now urgently needed for proper service. Nor does it mean that any stock hereafter sold in excess of the $3,000,000 shall be sold at less than par or at a higher rate of return than 6 per cent, except with the Council's approval at the time any new offering is made. It is a plan to take us through this time of stress and high money rates. I know of no better one. I know of none so fair to all concerned that has been put into effect by any corporation in any business to raise new capital.

Way Being Paved for New Toledo Grant

Present plans of the Toledo Railways & Light Company, Toledo, Ohio, are to turn over railway property to the Community Traction Company, about Feb. 20, the date of expiration of the ninety-day period allowed by the service-at-cost franchise ordinance for its legal acceptance and preparations for operation.

It had been thought that the company might be ready to operate under the new plan about Feb. 1, but many of the details connected with separating the property have been slow in working out.

At the annual meeting of the stockholders of the Toledo Railways & Light Company on Jan. 20, final action will be taken on the ratification of the new franchise agreement. The Doherty interests of course, control the common stock and they have furnished to the city a written agreement to accept the ordinance.

The board has narrowed down the list of applicants for the post of transportation commissioner to about four.

Seattle Outlook Unimproved

Mayor Insists Municipal Railway Shall Be Self-Sustaining Out of Operating Revenues

Hugh M. Caldwell, Mayor of Seattle, Wash., in a recent letter to George A. Leibes, accountant in the city comptroller's office, expressed himself as opposed to any plan to draw on the general fund or any other tax source to help finance the municipal railway.

The Mayor declares the $15,000,000 in bonds issued by the city in payment for the lines "are not worth anything like $15,000,000," and that immediately the city undertook to pay railway debts out of the tax fund, the bonds "would increase anywhere from $3,000,000 to $7,000,000 in value." The explanation for this statement would seem to be found in the fact that the bonds are a lien on the railway only and if the city is required to maintain the railway as a self-supporting institution out of the railway's earnings it would seem now to be a forlorn hope.

The Mayor said:

> If the general credit of the city, or any part of it, is to be placed behind these bonds, the amount should be reduced to somewhere near the real value of the lines purchased by us; otherwise, we will make a present of several million dollars to the company by taking some steps not required by the contract, which would enhance the value of these bonds.
>
> My position on this matter, however, is that the city is under neither a legal nor moral obligation to raise funds from any other source than the receipts of the railway to pay the principal and interest, operating and maintenance expenses; that since Stone & Webster made the contract and agreed to look to this source alone for their money, they should continue to look to it, and if the contract is not capable of performance according to its terms, modification thereof must be made by consent of the parties, or a decree of the courts, should the matter become the subject of litigation.

Mayor Caldwell stated that he had completed his investigation of the city's purchase of the lines from Stone & Webster and would be ready, when the Grand Jury met on Jan. 17, to proceed with the inquiry begun last November. The Mayor's report will not be submitted to the City Council until after the Grand Jury convenes.

Wages Advanced in Atlanta

After several weeks of negotiations a satisfactory agreement has been reached between the Georgia Railway & Power Company, Atlanta, Ga., and its employees, by which more than 1,100 men get a higher wage in 1921 than they received in 1920. This increase applies to the motormen, conductors and maintenance-of-way men, shopmen and workers in the carhouses covered by former annual contracts.

It is estimated the increase will cost the company $75,000 annually. Both sides have announced that the new arrangement is satisfactory to all concerned. The new scale of wages included in the new contract is based upon the number of months of service and is graduated as follows:

The first three months' service, 44 cents an hour.

The next nine months' service, 46 cents an hour.

After one year's service, 48 cents an hour.

This is an increase of 2 cents over the scale of 42 cents, 44 cents, and 46 cents, granted the men in the spring of 1920 by an arbitration board. The scale of 1920 was at first refused by the men, who went out on a four-day strike.

Salaries of Officers to Be Cut

Reductions of approximately 20 per cent in the salaries of all employees of the Cleveland (Ohio) Railway from the president down are expected to be announced about Feb. 1, according to intimations that have come from the executive offices of the company. This follows a 20 per cent reduction made in the wages of track laborers the first of the year, and presages a cut in the wages of the motormen and conductors when the agreement of their union with the company expires on May 1.

John J. Stanley, president of the company, has already announced that he proposes to reduce his own salary, which is $30,000 a year.

Fear of a strike on May 1 has already been expressed because union officials have indicated that they do not propose to accept any wage reduction without a struggle.

Because of the fact that the 6-cent rate of fare is not bringing in the revenue expected, due to a falling off in the number of riders, directors of the Cleveland Railway at their meeting late this month are expected to reject an ordinance passed by the City Council authorizing a half rate of fare for school children.

Wages Reduced in Rockford

Simultaneously with the order of the Public Utilities Commission of Illinois for a 1-cent increase in fare came the announcement of a reduction of approximately 10 per cent in wages of all employees of the Rockford City Traction Company and the Rockford & Interurban Railway. The cut is to be effective from Jan. 15, according to Manager W. C. Sparks.

The wage reduction, it was said at the local offices, is in line with the company's policy of retrenchment, made possible by lowering cost of living. Employees of the transportation companies have been notified of the new wage scale. It affects shop and trainmen and the office force.

The new wage scale for trainmen on the interurban lines will be from 50 to 53 cents an hour and on regular city runs (two-men cars) from 46 to 50 cents an hour. One-man car operators receive the same scale of pay as interurban trainmen.

The reduction in wages will amount to 7 cents an hour.

According to Mr. Sparks, trainmen on the interurban lines have been paid from $175 to $210 a month and city trainmen from $135 to $175 a month. The cut will reduce the wages from $10 to $12 a month.

News Notes

Inquiry Into California Commission Proposed.—Since the California State Legislature has convened at Sacramento a resolution has been introduced in the Senate authorizing a joint legislative committee to investigate complaints made against the California Railroad Commission. It was announced that a public hearing on this resolution would be held at a joint meeting of the Senate and Assembly public utilities committees on Jan. 18.

$1,191,000 in Improvement in Indiana.—Interurban lines in Indiana made plant additions and reconstructions costing approximately $1,191,000 during 1920, according to the annual report of M. D. Atwater, director of service for the Public Service Commission. The total additions and improvements in all public utilities amounted to $13,189,530 during the year. City railways spent a total of $2,527,500 during the year, mostly in Indianapolis, Kokomo and Terre Haute.

Utility Commissioners Unconfirmed.—Nominations made by Governor Edwards of New Jersey to compose a new Board of Public Utility Commissioners were not confirmed by the State Senate in special session. In a ten minute executive session, the Senate by a vote of nine to nine, refused to force the Senate judiciary committee to report the nominations to the Senate. The brief session adjourned without date. The nominations, therefore, died with the opening of the 1921 Legislature.

Council Approves Chicago Mayor's Plan.—The City Council of Chicago, Ill., voted sixty to one on Jan. 19 to approve Mayor Thompson's traction plan and submit it to the General Assembly to secure the enabling legislation. Many of the Aldermen objected to features of the plan, particularly the creation of another independent taxing body, but approved the plan because they did not apparently want to be placed in the position of opposing 5-cent fares and because it was understood that approval meant only the placing of the measure before the people for their decision. The so-called Thompson plan was reviewed at length in the ELECTRIC RAILWAY JOURNAL for Jan. 15, page 150.

Program of Meeting

Public Representatives of Urban Transit

A meeting of the Public Representatives of Urban Transit is to be held in Cleveland, Ohio, on Jan. 25. The meeting is called by W. C. Culkins, local street railway director at Cincinnati and president of the association.

Financial and Corporate

Steps Toward Reorganization

Rhode Island Companies Clearing the Way for Foreclosure and Sale Probably by April 1

In the Superior Court at Providence, R. I., on Jan. 5 steps were taken to bring about the foreclosure of the mortgages on the properties of the Pawtuxet Valley Electric Street Railway and the Cumberland Street Railway. The complainant in each case was the Central Union Trust Company, New York, representing the holders of mortgage bonds, and motions were filed by Richard B. Comstock, counsel, to consolidate the proceedings with the receivership of the Rhode Island Suburban Railway, owner of both properties subject to the mortgages.

FURTHER RECEIVERSHIPS

The court issued an order granting a hearing on the motions on Jan. 19, and at that time, if it grants the prayers of the complainants, it will appoint as receivers for the Pawtuxet Valley and Cumberland companies Benjamin A. Jackson and Harold J. Gross, receivers of the Rhode Island Suburban Railway, included in the system of the Rhode Island Company.

This completes the institution of foreclosure proceedings in the cases of all properties now operated by the Rhode Island company and opens the way to speedy transfer of the properties to the United Electric Railways when a plan of reorganization shall have been agreed upon by the security holders.

If the three protective committees representing the holders of bonds agree to accept the jitney ordinance—a measure upon which there has been insistence as an essential to the railway reorganization—and to proceed with the reorganization, copies of this plan will be sent to each set of security holders and they will have thirty days within which to accept or reject it. A little longer period will be allowed within which bondholders and stockholders who have not already deposited their securities with their protective committees may do so.

FORECLOSURE SALE BY APRIL 1

Foreclosure proceedings will then be hastened in the courts and it is expected that the properties will have been put up at public sale and bought in for the United Electric Railways before April 1.

The charter of the United Electric Railways will expire by limitation early in April if the company has not by that time taken over the traction system, or if the time limit shall not have been extended by act of the General Assembly.

The Pawtuxet Valley Electric Street Railway was incorporated July 23, 1891, with a capital of $200,000. The charter was amended March 14, 1893, and the capital increased to $400,000, of which but $247,200 in bonds have been paid in. The company conveyed all its property, rights, privileges and franchises to the Rhode Island Suburban Railway on Jan. 1, 1900, the latter company guaranteeing the bonds of the Pawtuxet Valley company both as to interest and principal.

The Cumberland Street Railway was incorporated on March 1, 1898, with a capital of $100,000, and on Jan. 1, 1900, conveyed its property to the Rhode Island Suburban Railway. There are $43,000 in outstanding bonds which are guaranteed by the Suburban company.

Another Brooklyn Route Abandoned

The operation of the so-called Park Slope line of the Brooklyn (N. Y.) City Railroad, extending from Borough Hall to Coney Island Avenue and Cortelyou Road, has been abandoned. As a result of the receivership of the Brooklyn Rapid Transit Company and later of the independent operation of the Brooklyn City Railroad, a number of routes which had been operated over the tracks of various companies were terminated in October, 1919. These suspensions inconvenienced the public in many sections of Brooklyn, and in an effort to determine whether relief could be found by the operation of cars over tracks of several companies, it was determined to establish the so-called Park Slope line, but it was specified that unless there was sufficient riding to give the companies an income which would pay for the cost of the service the route might be abandoned. The Public Service Commission approved the operation of the line on these conditions.

The operation of the line was commenced on April 12, 1920, and as the result of seven and a half months' service the gross receipts failed by $9,990 to meet the operating expenses. The commission was thereupon notified that service would be abandoned unless the commission consented to the establishment of a shorter route from Borough Hall to Park Circle. The companies expressed their willingness to operate this route for a period, provided the receipts were sufficient to pay the operating expenses.

Application was made on Dec. 22 to the Public Service Commission for permission to operate on this basis. On Jan. 11, however, the commission denied the application for approval of the proposed agreement with respect to the line from Borough Hall to Park Circle. As a result of commission's refusal the railway has ceased operation.

New Orleans Value Undetermined

Time Approaching When This Matter Must Be Settled if Fare Problem Is to Be Solved

The matter of the valuation of the railway property of the New Orleans Railway & Light Company, New Orleans, La., is one of the things that the knowing ones refuse to discuss. Meanwhile, the time is fast approaching when the question of how much the property is worth must be settled.

The company in one of its revised estimates placed the valuation at $55,000,000. On the other hand the special masters in chancery announced that they thought the property was worth $41,500,000. As none of the three masters was versed in utility valuation matters their estimate does not appear to have made a lasting impression upon the Federal Court, for the findings of the masters was not even mentioned in the court's report.

The newly elected Commissioner of Public Utilities has addressed a communication to the receiver to learn what progress, if any, he had made in the railway valuation matter, and to this the receiver has made answer that he is giving the subject due consideration.

COMPROMISE APPEARS LIKELY

The public utilities committee of the Association of Commerce has also directed inquiries to the Commissioner of Public Utilities to learn how soon a conference could be arranged between the Association of Commerce, the Commissioner of Public Utilities and the receiver of the railway. His answer was: "We are waiting on the receiver."

The consensus of opinion is that the valuation of the railway, gas and electric property when the matter is finally determined will be around $47,000,000 against the company's $55,000,000 and the masters in chancery $41,500,000.

Meanwhile, the "referendum" people, failing to secure the signature of the requisite 30 per cent of the registered voters for the repeal of the 8-cent fare, have petitioned the City Council to repeal the ordinance authorizing the increase, and have placarded the city with posters, in which it is pointed out that the real value of the property is only $27,420,410 while its paper value is represented to be $70,892,200, leaving a difference of $42,768,990, which the "referendum people" allege is "water."

One of the reasons assigned by the Commission Council, just expired, for advancing the fare from 6 cents to 8 cents was that the railway should be allowed the increase in order to permit it to meet the increased cost of material and the higher rate of taxation. Under the circumstances much surprise is expressed at the announcement made on Jan. 12 that the company had been notified by the city authorities that its property would be seized for the 1920 city taxes unless it paid its indebtedness forthwith. Its indebtedness to the city for the 1920 taxes is placed at $567,000.

Dallas Railroad $635,401 Behind

Directors Explain Deficit in Authorized Return — Credit Must Be Restored So Company Can Function Properly

The Dallas (Tex.) Railway, in response to the request of the City Commissioners, has presented to the members of that body a statement showing the condition of its property. The railway recently asked the City Commission to pass a regulatory ordinance authorizing an advance in rates from a 6-cent fare to a 7-cent fare, in the hope that the company might increase its earnings so as to establish a basis of credit on which it would be possible to meet its franchise obligations, pending the working out of a real service-at-cost franchise. The city has declined to accede to this and has laid the appeal on the table.

THE attitude of the company in its statement is that the railway must be met in a spirit of co-operation by the city's representatives if the traction problem of the city is be solved. In short, negotiations between the company and the city must be characterized by mutual understanding, where sound business and economic principles prevail, if Dallas is to be adequately served by its railway.

SOME STARTLING FINANCIAL FACTS

The statements of the company, filed monthly with the city, showing its financial status, reveal the fact that the company has earned in the thirty-eight months of operation between Oct. 1, 1917, and Dec. 1, 1919, over and above its actual operating expenses, interest charges and accident reserve, only $44 51. The accident reserve as of Dec. 1, 1920, amounted to $25,189. There were suits pending at this time amounting to $580,588, and in addition many unpaid accident claims.

The company's cash statement shows that the amount of cash in bank at the close of business Dec. 27 was $22,437, with bills payable and accrued power charges approximating $125,000. Each month the company has set aside and charged to operating expenses its estimated pro rata part of its ad valorem annual taxes, amounting to $119,754. This money has been used through the year for capital expenditures, and the account is to be reimbursed by loans which have previously been arranged for when the tax becomes payable the first part of 1921.

NOTHING FOR STOCKHOLDERS

The stockholders of the Dallas Railway have received nothing since the beginning of operations of the company on Oct. 1, 1917, and the company has earned an average rate of return of only 4.58 per cent on its property value, or just about enough to pay its interest charges.

On the matter of credit the directors said:

> It is true that the franchise requires the Dallas Railway to pave its portion of streets when ordered to do so by the city; and we, the directors, assert that the company is willing to do so whenever it is able. It can not do so without money, and it can not get money without credit. It can not have credit without adequate earnings to pay for its operations and the cost of new capital.
>
> It can readily be seen how impossible it is to expect investors to become interested in a company whose demonstrated earning power is only 4.58 per cent on the property value.

The directors then discuss the obligation of the General Electric Company toward the railway and the commitments made by C. W. Hobson. On these points they say:

> These statements are facts that can be controverted, and we believe that our fair-minded citizenship will concede that both the General Electric interests and the Dallas Railway have carried out their commitments so far as lay in their power.

On the specific point of the reason for their appeal the directors say:

> This communication is presented with the hope that immediate steps may be instituted whereby the railway problem will be approached with the desire for a solution which will be equitable both to the city and the company, and which will permit the immediate extension of the street railway facilities so badly needed.

On the matter of commitments cited as having been obtained from General Electric Company interests in case the franchise was granted to C. W. Hobson, the one calling for the greatest expenditure was the proposal for building two interurbans into Dallas of not less than 30 miles each in length. The committee says these interurban lines have not been built, for the reason that previous to the acceptance of the franchise by C. W. Hobson, the City Commission was notified that as the United States was then at war with Germany, it would be impossible to finance and build the two interurbans within the time first agreed upon. The franchise was thus accepted, with the above understanding, and the commission from time to time extended the time for beginning the construction of the interurban lines. Meanwhile, the citizens of Dallas voted to substitute the Wichita Falls interurban line for the two proposed interurbans. It was found impossible, however, to finance the Wichita Falls project, so that it is now being arranged to cause the two interurbans as first proposed to be built. The time set by the commission for starting the two interurbans is Jan. 15, 1921.

The promise was made that the Oak Cliff street railway lines, either through purchase or lease, would be placed on the same basis and have the same advantages to the citizens of Oak Cliff and to the people of Dallas generally as would pertain to the lines east of Trinity River. The directors point out that the Oak Cliff lines are now held under lease by the Dallas Railway and are operated by the management as a unified system with the lines owned by the company.

The railway has spent, to Dec. 1, 1920, $1,706,334 of new money on improvements and extensions to the property since the beginning of operations under the franchise, Oct. 1, 1917. The estimated additional amount to complete improvements in progress as of Dec. 1, 1920, is $134,637. This is more than the original commitment.

The directors point out that the promise has been kept that the Dallas Railway would be operated under a charter issued by the State of Texas and managed by local executives. The financial condition of the company and its showing as to earnings have, however, been such that the owners of the equity in the property have not been able to refinance it so as to diversify the ownership and place its notes and certificates of indebtedness, as was contemplated.

Pre-election commitments made by C. W. Hobson as to the doing of certain work by the Dallas Railway in case the franchise was granted are also gone into at length by the directors and disposition made one by one of the extent to which the promises have been fulfilled.

The disposition of the return of 4.58 per cent earned on the property value during thirty-eight months of operation, Oct. 1, 1917, to Nov. 30, 1920, is explained as follows:

Amount of return earned.......	$1,203,436
Disposition of return earned:	
Rent for Oak Cliff lines (three years at $115,000 a year, two months at $120,000 a year)...	365,000
Interest on $1,000,000 7 per cent secured notes..............	134,035
Interest on $750,000 6 per cent income, notes..............	142,500
Interest on $2,529,868 6 per cent income notes..............	456,217
Interest to Electric Bond & Share Company on short-term loans.	1,519
Interest to local banks on short-term loans totaling $250,000..	5,413
Interest to Dallas Electric Company on money borrowed to construct addition to interurban terminal	9,416
Interest on lease notes, or car trust certificates, given in connection with the purchase of fifty new cars	4,135
Three monthly payments of $7,666, each on principal, cost of fifty new cars	23,000
Monthly payments to Dallas Electric Company on principal of 10 per cent demand notes, as per agreement.....	6,918
Commission and expense in connection with procuring new money..	55,284
	$1,203,436

The total of bonds and notes outstanding, as of Dec. 28, 1920, was $4,892.288. A detailed explanation is included in the statement showing how these obligations are held.

Some facts taken from the company's records for the first thirty-eight months of operation, to Nov. 30, 1920, follow:

Railway earnings..............	$7,239,404
Railway expenses and accidents and repair reserves..........	6,213,984
Net from railway operation....	$1,025,419
Interburban terminal net earnings and non-operating income	178,016
Available for authorized return	$1,203,436
Authorized return under franchise, 7 per cent per annum on property value, or amount invested	1,838.540
Deficit in authorized return.....	$635,104
Rate of return earned on property value of investment (per annum), per cent............	4.58
Percentage of railway gross receipt expended on maintenance (minimum franchise requirement 10 per cent)	17.80

10,767,876 More Riders; 2,295,995 Fewer Miles

Trustees Report Better Results in Boston—No Prospect of Reducing Ten-Cent Fare—Railway Fulfilling Purpose

Pursuant to the provisions of Chapter 185 of the Special Acts of 1919 the trustees of the Boston (Mass.) Elevated Railway have submitted their second report to the Senate and the House of Representatives. The document covers the proceedings of the trustees for the year ended Dec. 1, 1920. The financial condition on Dec. 1, 1920, and the results of operation during the entire period of public control are set forth in a statement made a part of the report.

THE statement shows that for the twelve months ended Nov. 30, 1920, the cost of service exceeded receipts by $595,155, while during the twelve months ended Nov. 30, 1919 the cost of service exceeded receipts by $2,585,137.

The second year of operation under public control closed on June 30, 1920. The revenue in that year exceeded the expense of operation by $17,079. This surplus does not take into account $435,348 actually paid in October, 1919, but paid under a retroactive wage award applicable to the previous May and June. This amount would have been included in the assessment in July, 1919, against the cities and towns served by the railway had it been known in season for that assessment. Should this item properly be included in the cost of service for the year ending on June 30, 1920 there would still have been no deficit for that year under the budget system which had been adopted in accordance with a practice which was approved by the Department of Public Utilities.

Under that system the total expenditure for the year for maintenance of way, structures and equipment is estimated at the beginning of the year and charged proportionately to each month. When actual expenditures in any month exceed the allotted amount the excess is carried in reserve account to be offset by the credit arising during any other month in which less than the allotted amount is expended. At the end of the fiscal year the accounts are adjusted and show actual expenditures.

On June 30, 1920, in accordance with this procedure $418,343 had been charged to equalization and credited to operating expense. This amount coupled with the surplus of $17,079 would set off the item of $435,348 for back wages and leave a credit balance on June 30, 1920, of $75.47.

The actual cost of operation from July 1, 1920, to Dec. 1, 1920, covering the first five months of the third year of operation by the trustees exceeded receipts by $979,012. The results of operation in December will show a substantial profit. This, taken with the numerous offsetting credits to be made by adjustment in closing the book of the year, will very materially reduce previous losses. Though the exact figures showing the operating deficit on Dec. 31, 1920, are not yet available, it is estimated that it will not exceed an amount which in the judgment of the trustees can be absorbed during the next six months. In such case there will be no assessment upon tax payers next July.

Operation in 1920 faced extraordinary costs in expenses for removal of snow, advance in wages and higher prices of coal and materials. The abnormal snowfall of last winter cost more than the combined snowfalls of the preceding nine years. The direct expense attributable to removal of snow was $600,000; the indirect cost of the storms from added expense in maintenance of equipment and from loss of revenue increased this amount to approximately $1,000,000.

The wage agreement with the carmen's union expired on May 1 and in the absence of agreement as to future wages the issue was left to arbitration. The employees were awarded an increase of 16⅔ per cent. The present schedule is effective until July 1, 1921. Other agreements with craft organizations have expired and have been renewed with some advance in wages.

COMPARISON SHOWING GROWTH OF TRAVEL SINCE 1915

Year	Average Weekday	Average Saturday	Average Sunday	Average Holiday	Total for Year
1915	992,283	1,140,046	685,726	846,860	352,469,586
1916	1,050,038	1,218,749	718,804	832,962	373,577,908
1917	1,073,943	1,249,588	728,847	857,902	381,017,338
1918	985,384	1,147,809	658,902	775,634	348,664,700
1919	934,918	1,078,635	596,182	706,429	324,758,685
1920	960,737	1,072,319	591,063	703,634	335,526,561

The abnormal rise in price of coal has been most disturbing. The average cost of coal in 1919 at the power stations in Boston was $5.90 a ton; in October, 1920, the average cost had risen to $13.82 a ton; some coal has cost over $20 a ton.

The item expended for taxes, too, has been larger than that of the preceding year by about $200,000. The taxes of the coming year will undoubtedly be smaller.

The growth of travel is shown in the accompanying compilation.

Higher fares though increasing revenues cut down riding. The trustees point out, however, that no such reduction has been made in the number of persons using cars as to suggest that the railway is not fulfilling the purpose of its existence in furnishing a cheap method of transportation for the multitude of people. While between 10,000,000 and 11,000,000 more passengers were carried in 1920 than in 1919, 600,000 fewer passengers were carried on Saturdays, Sundays and holidays. The trustees say that the explanation for this is found in the fact that upon the days last named the automobile is in more general use as a substitute for the street car.

Though the arbitration award of last June advanced wages 16⅔ per cent, a rearrangement of working hours and conditions was effected which benefited all concerned and secured a large saving in labor costs. "Extra' blue uniform men were assured a full day's pay and all men are thus guaranteed an eight-hour day. Men not having schedule runs are required to be available for duty during eight-hour periods and to perform within their eight-hour periods such work as may be assigned to them.

A substantial economy has also resulted from the elimination of unprofitable mileage without impairment of service. Though 10,767,876 more passengers were carried in 1920 than in 1919 the mileage was less by 2,295,995 miles. The revenue per car-mile increased from 53.74 cents to 64.61 cents and the number of revenue passengers per car-mile from 6.066 to 6.548. An important factor contributing to the net increase in earnings was the operation of additional three-car trains and one-man cars.

The high cost of coal has in a measure been offset by economies in use of power. Coasting recorders have been introduced with good results. It is estimated that when the entire system is equipped with these instruments an economy of more than $100,000 a year will be secured.

The following tabulation shows the number of tons of coal burned in 1920 as compared with that burned in the previous year:

TONS OF COAL BURNED

	1919	1920
January	28,020	33,874
February	24,990	26,045
March	26,440	24,838
April	24,396	21,073
May	22,778	17,999
June	20,775	16,426
July	18,088	16,693
August	20,817	16,617
September	20,609	17,226
October	23,886	18,953
November	26,131	22,955
December	30,740	25,386
Totals	287,670	258,085

The number of pounds of coal consumed to generate one kilowatt in 1920 was 2.346 as compared with 2.835 in 1919.

Seventeen miles of track have been reconstructed; eighty-one one-man cars of the most approved pattern have been purchased and put in commission; 105 additional center entrance cars have been purchased and are to be delivered in the spring; sixty-five new steel cars have been bought to replace cars upon the elevated structure and are to arrive in the summer; four-car trains are now running through the rush hours in the

Cambridge Subway and Dorchester Tunnel; a new carhouse and new lobby have been constructed at Fields Corner; additional rotary converters have been bought for the equipment of substations connected with the power plant; and large preliminary expenditures have been made for the extension of yard facilities at Forest Hills and the construction of much needed repair shops in Everett.

MILEAGE RATES IMPROBABLE

The trustees say there is no prospect of any immediate reduction from 10 cents as the basic flat fare. Experiments have, however, been made with a 5-cent service without transfer on lines where the run is short and where there is little competition with the 10-cent lines.

According to the trustees some modification of the present system of flat fares with a view to a rate more nearly proportionate to the length of ride is not improbable when conditions are such as to warrant it, but it is improbable that the flat fare upon the Boston system will give way in the near future to any radical change through the substitution of mileage rates.

CAMBRIDGE SUBWAY PROCEEDS

The proceeds received from the sale of the Cambridge Subway amounted to $7,868,000. The disposition of this money was made subject in the statute to the approval of the Department of Public Utilities. The board of trustees petitioned the Department of Public Utilities for authority to spend this sum for the purposes which the trustees cite in detail, but the Department of Public Utilities after a hearing directed the application of the fund to the following purposes:

$1,500,000	for payment of Boston Elevated Railway Company bonds due March 1, 1920.
$1,581,000	for payment of West End Railway Company bonds due August 1, 1919.
375,000	for payment of West End Railway Company note due February 1, 1920.
1,581,000	for payment of West End Railway Company bonds due August 1, 1920.
1,561,245	for payment of permanent additions to West End Railway Company property.
269,754	for payment of additions and improvements to Boston Elevated Railway property.
1,000,000	appropriated for Forest Hills Terminal yard and Everett Shops.
$7,868,000	

Suggestions of legislation desired by the trustees were duly filed in the office of the Secretary of the Commonwealth and have been printed as House Document 103.

LEGISLATIVE CHANGES SUGGESTED

The trustees also recommend a change in Chapter 185 of the Special Acts of 1919 that will permit them to file their annual report on Feb. 1 so that it may give the result of operations for a full calendar year. To give such a statement it is necessary to make the proper adjustment of numerous credits and debits which it is impossible to estimate and for which figures were not available in season for filing such a report on Jan. 15.

Simplification an Object

One Company, One Mortgage and One Franchise the Aim in Pittsburgh Reorganization

Reorganization of the Pittsburgh (Pa.) Railways is in sight, according to statements of special Counsel Charles K. Robinson to the City Council during the week ended Jan. 15. Mr. Robinson also informed Council that Receivers Charles A. Fagan, S. L. Tone and W. D. George of the railway had decided to do the paving as well as track reconstruction work involved in the improvement of East Ohio Street. This work the city had expected to do as the receivers formerly had maintained they were not in a position to do it. This action will save the city approximately $94,000. Mr. Robinson credited the present receivers with a desire to cooperate with the city and public.

For the future, outlining a plan in behalf of the city, Mr. Robinson said those interested were aiming at a complete reorganization of the Pittsburgh Railways as one company, with one franchise and one mortgage. At present the railway consists of 200 separate companies, holding 500 franchises on streets, with a result that the chief engineer of the Public Service Commission, after two years' work in Pittsburgh, said the city had the most complicated traction situation in the State.

Joint action with the city of Philadelphia to obtain better traction regulation has been decided upon at Pittsburgh. A resolution which has been adopted urged action before the Public Service Commission for the purpose of "securing justice for the people of the two largest cities in the State on the important matter of street car transportation."

With Philadelphia as the complainant, a case is due to be argued in April before the Supreme Court on the right of the city to attack rentals which the Philadelphia Rapid Transit Company is paying various underlying companies. The Public Service Commission upheld the city's right to inquire into such rentals, but the State Superior Court reversed this decision and an appeal was taken to the Supreme Court.

The Pittsburgh Railways similarly includes a number of underlying companies. The rentals of these, inextricably bound up also in the payment of bond and mortgage interest, which in most cases is guaranteed as part of the rental, total about $3,250,000 annually. The city's interest in the Philadelphia case is in the principle involved.

Receivers for North Shore Road

William Paul Allen, former assistant district attorney of New York, and John G. Moran, secretary of the New York & North Shore Traction Company, were appointed receivers of the railway on Jan. 19 by Judge Chatfield sitting in the Federal Court in Brooklyn. The receivership resulted from an action in equity by the Citizens Savings & Trust Company, Cleveland, Ohio.

Financial News Notes

Service Resumed.—The Eastern Massachusetts Street Railway has resumed service on the Somerset and Swansea line as far as Swazey's Corner. A temporary permit was issued to the company pending the final decree of the court hearing which takes place in Boston. Service on this line was suspended a year ago.

I. T. S. Subsidiary Financing.—The Bloomington & Normal Railway & Light Company, Bloomington, Ill., included in the Illinois Traction System, has petitioned the Illinois Public Utility Commission for permission to issue $108,000 of preferred stock and $165,000 of bonds, of which the sum of $72,000 will be first and general mortgage bonds.

Protective Committee Formed.—Default having been made in the payment of three installments of interest on the general consolidated 5 per cent gold bonds of the Atlantic Avenue Railroad, Brooklyn, N. Y., dated April 23, 1891, and due in 1931, a protective committee of bondholders has been formed with George E. Warren, vice-president of the Columbia Trust Company, as chairman. The Atlantic Avenue Railroad is included in the system of the Brooklyn Rapid Transit Company.

Subsidiary Elects E. M. Walker President.—E. M. Walker, Terre Haute, has been named president of the Terre Haute & Western Traction Company. Frank T. O'Hair has been named vice-president and John Beasley, Terre Haute, secretary. The directors named are E. M. Walker and John Beasley, Terre Haute; F. T. O'Hair, Fred Baber and James Stewart, Paris. The company is controlled by the Terre Haute Traction & Light Company, which in turn is controlled by the Terre Haute, Indianapolis & Eastern Traction Company. Mr. Walker is local resident manager at Terre Haute.

Permission Asked to Extend Bonds.—The Fitchburg & Leominster Street Railway, Fitchburg, Mass., has petitioned the Department of Public Utilities for permission to extend for five years, from Feb. 1, 1921, maturity of $300,000 of mortgage bonds and $100,000 of first mortgage bonds of the Leominster, Shirley & Ayer Street Railway. The company also seeks to increase interest rates on these issues of securities from 4½ per cent and 5 per cent respectively to 7 per cent on both issues because of its inability to market new bonds to meet maturing issues. The Leominster, Shirley & Ayer Street Railway is a subsidiary of the Fitchburg & Leominster Street Railway.

Traffic and Transportation

Syracuse Case Heard

Session at Albany Before Commission in Ten-Cent Appeal Concerned Mostly with Valuation

Corporation Counsel E. H. Lewis, representing the city of Syracuse, cross-examined witnesses for the New York State Railways before Public Service Commissioner J. A. Kellogg on Jan. 7 on the company's application for a 10-cent fare in Syracuse. Messrs. Gannon and Michell of Syracuse appeared for the company.

Mr. Lewis examined Horace D. Campion, Philadelphia, the engineer who made the valuations for the New York State Railways, Syracuse Lines, reproduction cost, new, at present day prices, $21,012,200; average costs 1915 to 1919, $16,663,299; and pre-war costs $12,006,134, going into detail concerning the various cost figures which Mr. Campion employed, particularly in the $21,012,200 valuation. Mr. Lewis objected to certain testimony by Mr. Campion covering real estate and buildings, the valuation for which had been made by R. T. Fredericks and E. C. Cook and accepted by Mr. Campion in his valuation, but Commissioner Kellogg accepted the testimony for what it was worth and subject to later supporting testimony. Mr. Campion said many of his computations were theoretical, based on facts and experience.

ALLOWANCE FOR WORKING CAPITAL

Mr. Campion told Mr. Lewis, although the company's business was a cash one, that the company should have an allowance for working capital so that it could buy materials on favorable figures and maintain a necessary bank balance.

At the conclusion of the evidence on Jan. 7 the counsel were unable to agree on an adjourned date, Mr. Michell and Mr. Gannon urging that the hearing be continued at an early date.

J. M. Joel, the company's auditor, was questioned by Mr. Lewis about repair and other work at the Wolf Street carhouse for Syracuse suburban lines, the valuation of which, $450,000, was charged to the Syracuse lines. Mr. Joel said he could not give the company's expenses on the service-at-cost plan at Syracuse, but he promised Mr. Lewis that he would prepare such a statement. Mr. Campion also presented a tabulation showing the weekly and monthly payroll of the Syracuse Lines.

COMMISSIONER OVER-RULES CITY'S PLEA

Mr. Lewis objected to the commission's consideration of the evidence in the Syracuse 6-cent fare case, but Commissioner Kellogg over-ruled the motion. Mr. Lewis said he would want time in which to examine that record as another field was opened up and he might want to meet something contained in it.

There were also present at the hearing Walter S. Kernan, Utica, and B. E. Tilton, Utica, vice-president and general manager; Milo R. Maltbie, New York, assisting Mr. Lewis; Ray B. Smith and City Engineer Allen of Syracuse.

Commissioner Kellogg announced Jan. 18 as the next hearing day, with all the evidence to be submitted to the commission at that time.

Fares Lower in Wisconsin than Average in United States

Street car riders in Wisconsin are paying less than the average fare charge throughout the United States, according to a comparison, made by the Wisconsin Public Utilities Bureau, between statistics compiled for the nation by the American Electric Railway Association and for the State by the Railroad Commission. The association's figures further show that of the 287 cities of the United States having a population of more than 25,000 there is a distinct movement toward a basic charge of 10 cents.

In Wisconsin nearly all the urban population is paying a 7-cent cash fare or less. Of the 19 cities having local service, only two cities have a 10-cent cash fare and their combined population is only 49,310. They are, Green Bay and Janesville. The ticket fare in Green Bay is 7 cents; in Janesville 7 1/7 cents.

Of the cities in Wisconsin which have a combined population in excess of 1,000,000 people, three have a 5-cent cash rate, five a 6-cent rate, six are paying 7 cents, three have an 8-cent rate, and two a 10-cent rate.

A tabulation of present fare charges in various Wisconsin cities and towns is published above.

TABULATION SHOWING FARES IN WISCONSIN CITIES

City	Population	Cash Fare (Cents)	Ticket Fare (Cents)	Became Effective
Appleton	19,561	5	....	2/12/19
Ashland	11,334	7	6¼	10/16/18
Beloit	21,284	5	....	....
Chippewa Falls	9,130	6	....	....
Eau Claire	20,880	6	....	8/ 1/18
*Fond du Lac	23,427	8	7	9/ 5/20
*Green Bay	31,017	10	7	1/ 1/21
Janesville	18,293	10	7 1/7	10/29/20
Kenosha	40,472	7	6¼	10/30/20
*La Crosse	30,363	7	6¼	12/8/20
Madison	38,378	6	5 5/9	11/16/18
Manitowoc	17,563	6	6	8/9/18
Marinette	13,610	7	5	8/27/20
Merrill	8,068	7	5 5/9	12/23/18
Milwaukee	457,147	7	6¼	11/2/19
*Oshkosh	33,162	8	7	9/17/20
*Sheboygan	30,955	8	7	9/11/20
Racine	58,593	7	5 5/6	12/1/20
Superior	39,624	5	....	....

* These cities, Fond du Lac, Green Bay, La Crosse, Oshkosh, Sheboygan, have a family ticket rate of fifty rides for $3.

Refuses to Reduce Fort Worth Seven-Cent Fare

The Northern Texas Traction Company, which operates the local lines in Fort Worth, Texas, has declined to reduce its fares from 7 cents to 6 cents, as asked recently by the City Commission. The refusal to comply with the request was made known to the commission in a formal communication from George H. Clifford, vice-president and general manager of the company. The city had requested that the fare be reduced to 6 cents pending a hearing on what would be a fair and equitable rate of fare for the traction company.

The City Commissioners held that Mr. Clifford's communication was unsatisfactory as lacking definiteness. Mr. Clifford made the plea that the high cost of fuel oil and other articles used in operation and maintenance of the car lines, and the city communication in reply pointed out that the traction company raised fares from 6 cents to 7 cents largely on the plea that the cost of fuel oil had advanced, but that now the price of fuel oil had declined until it was below the level paid when fares were 6 cents.

Mayor W. D. Davis suggested to the commission at the time the communication from Mr. Clifford was received that the resolution prohibiting the operation of jitneys be revoked and that the operation of jitneys be encouraged as a means of forcing the traction company to reduce fares.

Railway Asks Accident Damages

Reversing the usual procedure the Municipal Railway of St. Petersburg, Fla., is bringing suit on its own account in a case growing out of a collision between an electric car and an automobile truck. The accident is alleged to have been caused by the reckless driving of the man in charge of the truck. The electric car, of the one-man type, was badly damaged. Charles R. L. Ludwig, who is in charge of the Municipal Railway, says that the city "is going to start and maintain a policy of making the other fellows pay for damage to cars when it is a clear case of being the other fellow's fault."

Outlook Brighter for Louisville Fare Increase

An ordinance has at last been introduced in the General Council of Louisville, Ky., which promises to afford the Louisville Railway financial relief. This measure, which has already been passed by the Board of Aldermen, provides for an increase in the cash fare to 7 cents for a period of two years. The railway is required to sell four tickets for 25 cents and to carry school children for half fare. Free transfers are to be continued. The company is to maintain the pavement between the tracks and for two feet beyond the outer rails in the same state of repair as that in the remainder of the street.

During the life of the agreement the railway is to limit the payment of dividends to the following: Accumulated dividends on its preferred stock; current dividends of 5 per cent per annum on preferred stock; dividends of not more than 2 per cent on its common stock. The company has so far taken no steps to curtail its service in spite of an announcement by James P. Barnes, president, that service would be cut 25 per cent on Jan. 1. However, if relief is not given shortly, the indications are that service will have to be reduced if the railway is to continue to operate.

Eight Cents in Peoria

The Peoria (Ill.) Railway on Jan. 12 raised its fare from 7 cents to 8 cents under authority of an order of the State Public Utilities Commission. Two tickets are being sold for 15 cents. Children between the ages of five and twelve years are carried for 4 cents.

When the company sought relief in the shape of a higher fare last June, to take care of the 25 per cent wage increase granted its employees, it was estimated that an average fare of 7.72 cents a passenger would be required to yield a sufficient revenue for operating expenses and fixed charges. This was on the assumption that there would be no falling off of traffic due to the proposed fare increase or other causes. It was estimated that should there be a 5 per cent decrease in number of passengers carried, an average fare of 8.05 cents a passenger would be needed.

The company therefore sought a 10-cent cash fare, with ticket fares ranging from 8⅓ cents to 7 cents. The 8-cent fare allowed by the commission means an average fare of 7.5 cents, which, according to company officials, will not entirely afford the added revenue necessary to care for operating expenses. Since last June the railway has been operating on a straight 7-cent fare.

New Rates Effective in Seattle

The increased fare on the lines of the Seattle (Wash.) Municipal Railway became effective on Sunday, Jan. 8, the new schedule of fare being: Cash fare, 10 cents; or three rides for 25 cents, making the token fare 8⅓ cents. Six tokens are sold for 50 cents, or twelve for $1. School children continue to ride for 3 cents, or two for 5 cents, with school tokens at the rate of ten for 25 cents. The 6¼-cent bronze token is no longer accepted, but purchases may be traded in for the new "silver" token. The new tokens are sold on the cars, and carmen also sell the tokens at important downtown transfer points. The city purchased 2,140,000 of the bronze tokens last July when the first increase in fare became effective, at a cost of $18,270. More than 1,400,000 had been issued at the time of the second increase.

Riders Approve Increase

An unusual occurrence took place on Jan. 7 in Lakewood, Ohio, a suburb of Cleveland, with a population of 41,732 people, when the car riders voluntarily agreed to an increase in fare to 6 cents.

Because of a separate franchise contract with the Cleveland Railway Lakewood riders, although being hauled a greater distance than Cleveland patrons, have since the middle of November been riding for 5 cents, although Cleveland car riders have been compelled to pay a 6-cent fare. City Street Railway Commissioner Fielder Sanders has given it as his opinion that the Lakewood car riders cannot be forced to pay a higher rate of fare. However, he appealed to their sense of fairness and asked that the car riders themselves vote on voluntarily paying the same rate as the Cleveland riders. This the Lakewood car users did on Jan. 7, with the result that 6,156 voted in favor of paying the 6-cent rate, while only 2,768 voted against increasing the rate of fare.

For the Cleveland rate of fare
and Present Service
TEAR OFF THIS END

....

LAKEWOOD CAR RIDERS

You have better street car service than Cleveland at a less rate of fare and at less than COST. Cleveland car riders are paying YOUR EXTRA COST.

Cleveland asks you to pay your own way or receive less service. You are not asked to change your 3c. fare.

WILL YOU BE FAIR, PAY THE CLEVELAND RATE AND KEEP YOUR SERVICE?

If YES—Tear off the top of the card and hand it to the collector.
If NO—tear off the bottom.

....

Against the Cleveland rate of fare
TEAR OFF THIS END

"BALLOT" USED IN LAKEWOOD POLL

In taking the vote on the cars throughout the entire day none of the riders was asked to give his name. The rider merely pulled off a stub, thereby approving or rejecting the proposed increase, and cast it into a ballot box. Now Mr. Sanders is endeavoring to have the Lakewood Council follow the expressed wishes of the car riders by formally authorizing the company to charge 6 cents in Lakewood.

300 per Cent Increase in Auto-Car Collisions

Declaring that collisions with automobiles have increased 300 per cent in the last seven years and now constitute one-half of all accidents that occurred during the year on the Pacific Electric Railway System, S. A. Bishop, general claim agent of the company, has issued an appeal to automobile drivers for greater caution in traveling over public thoroughfares. The number of fatalities reached the peak with seventeen deaths recorded for the month of November, 1920, from accidents in which the Pacific Electric was involved. In not a single instance was it shown that the company or its employees was at fault.

The company's records show that in November, 1920, there was a total of 301 accidents from interference with vehicles, as against 124 during the same month in the year 1913. In step accidents, from falling or alighting from steps, a decrease from the 1913 figures was shown, with ninety-six such accidents reported. The total number of accidents of all kinds for the month was given at 529, the greatest in any one month in the history of the company, and an increase over the 1913 figures of 102 accidents. Mr. Bishop calls attention, however, to the fact that the increase in vehicular accidents of 177 for this period is the most serious and requires earnest thought, attention and co-operation in order that it may be remedied in the interest of the community without loss of time.

Court Approves Double Fares

The Appellate Division of the Supreme Court, State of New York, has decided that the Brooklyn City Railroad has the right to charge two fares on its Flatbush Avenue line, one in the old town of Flatbush and another in the old town of Flatlands. In consequence the company began to collect such fare on Jan. 17.

The town line is at Foster Avenue, and the second fare charge applies to passengers boarding the cars of this line west of Foster Avenue and riding to points east of Foster Avenue, or vice versa.

The enforcement of the collection of this second fare is under the same conditions that prevailed when the company originally endeavored to collect such fare and ceased doing so by order of the Public Service Commission for the First District after vehement protests by car riders.

The Brooklyn City Railroad occupies a very unusual position in that its outstanding bonded debt is probably only from 10 to 15 per cent of the value of its property, and may be said to be approximately equal to the real estate owned by the company. Under these circumstances a condition which would force the average traction property into receivership because of its inability to earn the interest on its bonded debt does not apply to the Brooklyn City Railroad.

Transportation News Notes

Eight Cents in Rockford.—The Illinois Public Utilities Commission has authorized the Rockford City Traction Company, Rockford, to raise its cash fare to 8 cents. The fare has been 6 cents, with five tickets for 30 cents.

Six-Cent Fare in Effect.—The Twin City Rapid Transit Company, Minneapolis, Minn., which operates the electric railway lines in Stillwater, Minn., has raised its fare on its Stillwater lines from 5 cents to 6 cents. The new rate was approved by the Stillwater City Council.

Eight Cents in Each Zone. — The Westchester Street Railroad, White Plains, N. Y., has been authorized by the Public Service Commission for the Second District to charge an 8-cent fare in each zone except in zone 1. The company has also been granted permission to abandon a portion of its line.

Straight Nickel Fare to Continue.—The City Council of Akron, Ohio, has passed an ordinance allowing the Northern Ohio Traction & Light Company to continue to charge a straight 5-cent fare for a period of three months, pending action on the proposed service-at-cost franchise. The company was to have returned to the practice of selling six tickets for 25 cents on Jan. 1.

Eight Cents in Streator.—The Illinois Public Utilities Commisson has authorized the Illinois Light & Traction Company, Streator, to charge an 8-cent fare on its lines in Streator. The People's Traction Company, Galesburg, has been ordered by the commission to continue its present rate schedule between Galesburg and Abington. The company had applied for an increase in the interurban rate.

Return to Old System of Fare Collection.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has returned to the old system of collecting fares. Rankin Johnson, president of the company, says that the fare boxes have not facilitated the work of the conductors to the extent anticipated and that the old system of having patrons pay the conductors will probably result in the more rapid handling of crowds.

Ten Cents in Kewanee.—The Illinois Public Utilities Commission has authorized the Galesburg & Kewanee Electric Railway, Kewanee, to charge a 10-cent cash fare on its Kewanee city lines. The company is to sell three tickets for 25 cents. The fare has been 8 cents with five tickets for 35 cents. The commission has authorized the Galesburg Railway, Lighting & Power Company to continue a 10-cent cash fare and to sell three tickets for 25 cents.

Ten Cents in Green Bay.—The Wisconsin Railroad Commission has authorized the Wisconsin Public Service Company to charge a 10-cent fare on its lines in Green Bay. Tickets will be sold in strips of five for 35 cents, with commutation tickets good for fifty rides for $3. This is not a final order of the commission but will be in effect until a study of the results obtained under these rates can be made by the commission.

Would Charge 10 Cents.—Application has been made to the State Board of Public Utility Commissioners by the Bridgeton & Millville Traction Company, Bridgeton, N. J., for permission to raise its fare to 10 cents and to abandon parts of its line. The lines on which the company seeks to discontinue service are between Newport and Port Norris and Bivalve, the Church Street and Irving Avenue line in Bridgeton and the Tumbling Dam Park. The present fare is 7 cents.

Will Vote on One-Man Cars.—The taxpayers of Saskatoon (Sask.) will vote at the 1921 municipal elections on a proposal to adopt one-man cars on the city-owned electric railway system. The City Council was recently compelled to raise the fares to 10 cents, but a downward revision is promised if one-man cars are permitted. The Brandon (Man.) Municipal Railway has raised its cash fare 2 cents above the old 5-cent rate. Limited tickets are sold at 5 cents and unlimited tickets at 6 cents.

Dime Fare Denied.—The City Commission of Owensboro, Ky., has denied an application of the Owensboro City Railroad for an increase in fare from 7 cents to 10 cents. The commission took the stand that to increase the fare at this time would reduce the number of car riders materially. The company has announced that it will discontinue service to Hickman Park, one of the principal parks of the city, and that it will introduce other economies. The fare was raised from 5 cents to 7 cents about a year ago.

Trolley Rights Not Exclusive.—Holding that the citizens of the State have the right to use of the streets either with their individual conveyances or collectively in conveyances hired by them so long as they do not interfere with the rights of others, Merrit Lane, counsel for the jitney owners in their fight with the Public Service Railway, has filed his brief in the Court of Chancery. Mr. Lane argued that the public was not bound to use railways as a means of conevyance and that the jitneys had as much right to the streets as trolley cars.

Mayor Demands Fare Reduction.—Benjamin Bosse, Mayor of Evansville, Ind., in his annual message to the City Council of that city, has suggested that the Indiana Public Service Commission be requested to reduce the fares in Evansville to 5 cents. The city lines are operated by the Evansville Public Service Company, which also operates from Evansville to Patoka, Ind. The company now charges 6 cents for city fares, but a patron is permitted to purchase twenty tickets for $1. The Indiana Public Service Commission is expected to pass upon the matter in the near future.

Ticket Counterfeiting Plot Unearthed.—In the Quincy Division of the Eastern Massachusetts Street Railway a counterfeiting plot of such proportion has been unearthed that it has become necessary to call in and exchange the blue form tickets heretofore used under which twelve rides were sold for $1. A new form of ticket was put on sale for several days at the same rate in the rooms of the Chamber of Commerce and such blue tickets as were "real" were exchanged. Officials of the railway company have offered a reward of $1,000 for the apprehension of the counterfeiters and also $250 for information leading to the arrest and conviction of any one selling the counterfeit tickets.

City Prepares for Fare Appeal.—The City Commission of San Antonio, Tex., has voted to retain Robert J. McMillan as special attorney to prosecute the city's suit against the San Antonio Public Service Company, which operates the local railway system, to compel the company to reduce fares. The case is now pending before the United States Supreme Court on an appeal. The case originated when the company, under authority granted by the Federal Court after a hearing before a special master in chancery who held the former rates were in effect confiscatory, raised its fares from 5 cents to 8 cents. The higher fare was made effective in an arbitrary order by the company when negotiations with the city failed.

Merchants Favor Worcester Increase.—Clark V. Wood, president of the Worcester (Mass.) Consolidated Railway, has notified the city authorities that the company must secure additional revenue if it is to continue to furnish service of the present quality. Mr. Wood states that the 7-cent fare now in effect has proved inadequate and that it will be necessary to raise the rate to 10 cents on the city lines and to 7 cents on the suburban zones. Mr. Wood's plan has been indorsed by the local Chamber of Commerce. Mr. Wood recently stated that for the eleven months ended Dec. 1 the increased revenue under the 7-cent fare was $384,389, while operating expense for the same period showed $569,387, and the road had a surplus of but $2,861 at the end of the eleven months' period. This is only the difference between revenue received and operating expense, not providing for payment of taxes and interest. He gave as an estimate figures for operating expense for the year 1921, based on the 1920 figures, and providing for increased taxes and the wage increase, as $5,087,290. Citing the estimated revenue of 1920 at $2,365,540, he maintained the road must have increased revenue sufficient to make up the estimated deficit for 1921 of approximately $721,000.

Personal Mention

Mr. Crecelius in New Work

Superintendent of Power at Cleveland Goes Into Consulting Engineering and Construction for Himself

Lawrence P. Crecelius has resigned as superintendent of power of the Cleveland (Ohio) Railway and will be head of a new engineering firm to engage in consulting engineering, construction and operation of properties.

Mr. Crecelius has been with the Cleveland Railway as power superintendent since 1910. Previous to that he held the same position for two years under the receivers who operated the Cleveland traction lines. From 1900 to 1906 he was electrical engineer for the United Railways, St. Louis, and for a year following that was associated with the Public Service Corporation of New Jersey. He has become well known to engineers throughout the country for his original work in the design of electrical equipment, in particular 60-cycle rotary converters. He holds a large number of patents covering types of rail bonds and methods of bonding, and has done much original work in the design of boiler settings and the operation of boiler plants.

L. P. CRECELIUS

Mr. Crecelius was one of the first to recognize the desirability of the purchase of coal upon a heat value basis with deductions for excessive amounts of sulphur and ash. The Cleveland Railway's coal contract, which was drawn up by him, has been copied by many other companies through the country. Another innovation in Cleveland during his tenure of office was the extensive use of the reinforced concrete trolley pole designed by Mr. Crecelius and copied in hundreds of different towns and cities. Mr. Crecelius was among the first to make a careful study of the question of electrolysis mitigation, including thorough potential surveys. As a result of his activity the damage to underground structures due to electrolytic corrosion has been much mitigated in Cleveland.

Within the last year the attention of engineers and railway operators has been directed to the new automatic substation of the Cleveland Railway. This is the largest automatic substation so far put into commission and it represents a long step forward in the status of this art. The development of this substation has been carried forward under Mr. Crecelius' direction. Since 1912 the Cleveland Railway has installed altogether six new substations. The design of these substations and the equipment used in them have been discussed from time to time in the ELECTRIC RAILWAY JOURNAL.

Mr. Crecelius is a past-president of the American Electric Railway Engineering Association and has for many years been very active on the committees of this association of the American Institute of Electrical Engineers, and of other engineering organizations and societies. His papers and articles have frequently appeared in engineering society transactions and in the technical press.

Until about April 1 Mr. Crecelius' address will be the Leader-News Building, Cleveland. After that date his offices will be located in the new Hanna Building, Cleveland.

S. S. Vandenburgh, Safety Manager

Spencer S. Vandenburgh has been appointed manager of the newly created Safety Council of Louisville, Ky. Mr. Vandenburgh is an electric railway man of many years' experience. Prior to his appointment at Louisville he was assistant engineer in charge of office and field engineering of the Schenectady (N. Y.) Railway. He was born in Schenectady in 1884. He received his early education in the public schools of that city, later completing a scientific course at the Union Classical Institute, and studied at Union College. During his vacations he was employed at various times in machine shops and on the erecting floor of the American Locomotive Company at Schenectady, later entering the drafting department of the General Electric Company.

In 1903 Mr. Vandenburgh joined the Schenectady Railway in connection with the construction of the twenty-two-mile interurban line between Schenectady and Saratoga Springs. Two years later he entered the employ of the New York Central Railroad on grade crossing elimination work, and other branches of field and office engineering. In 1906 he returned to the Schenectady Railway.

Mr. Butler in Atlanta

Manager Winnipeg Electric Railway Made Manager of Railways Georgia Railway & Power Company

Frank L. Butler, manager of the Winnipeg (Man.) Electric Railway, has tendered his resignation to accept a position as manager of the railway department of the Georgia Railway & Power Company, Atlanta, Ga. Mr. Butler will take over the duties until recently performed by W. H. Glenn. Mr. Glenn resigned as vice-president of the Atlanta system on Dec. 1 last to become president of the Shippers Compress Company. Mr. Butler will assume his duties in Atlanta about Feb. 1.

In his new position Mr. Butler will have charge of the operation of one of the most extensive railway properties in the South. The Georgia Railway & Power Company owns and controls more than 230 miles of track and serves Atlanta and nearby cities.

Mr. Butler returns to the United States after an absence of three years, during which time he served with the Winnipeg Electric Railway, first as general superintendent, and more recently as manager. He was born in Terre Haute, Ind., in 1874. At the age of twenty years he entered the employ of the Vandalia Railroad, now a part of the Pennsylvania system. He was employed in various capacities in several towns along the line of the Vandalia Railroad until February, 1909. He then resigned to become superintendent of the Denver & Intermountain Railway, Denver, Col. He subsequently became vice-president of the company.

F. L. BUTLER

Mr. Butler resigned on Sept. 1, 1911, to accept the position of general manager of the Alton, Jacksonville & Peoria Railroad, then under construction. Shortly thereafter he was appointed receiver of the company and later completed the line as far as Jerseyville, Ill. In July, 1913, he became general manager of the Chicago & West Towns Railway and of the Suburban Railway, with headquarters in Chicago, and remained in charge of those properties until April 1, 1918. He then resigned to join the Winnipeg Electric Railway.

M. B. Stewart has taken a position as assistant to S. L. Duckett, chief construction engineer of the Southern Public Utilities Company, Charlotte, N. C. Mr. Stewart is a graduate of Berry Industrial School and Berea College. He was connected with the construction department of the Eastman Corporation, at Kingsport, Tenn., before joining the Southern Public Utilities Company a short time ago.

P. B. Sawyer has been elected president of the Lehigh Valley Transit Company, Allentown, Pa., to succeed Harrison R. Fehr. Mr. Sawyer has been a vice-president and director of the Lehigh Valley Transit Company and its subsidiaries for the past three years. He is a vice-president of the Lehigh Power Securities Corporation, which controls the Lehigh Valley Transit Company. He will continue to reside in New York.

Joseph Russell, superintendent of railways of the Eastern Texas Traction Company, Beaumont, Texas, has resigned to become electrical engineer for the Gulf Refining Company with headquarters in Houston. He has been succeeded at Beaumont by W. A. Robertson. Mr. Robertson has for some time been in the employ of the Houston Electric Company and has served as superintendent of transportation of the Galveston-Houston Electric Railway's interurban line.

E. C. Ryder, president of the Bangor Railway & Electric Company, Bangor, Me., for the past five years, has resigned and will devote his time to the practice of law. Mr. Ryder is a well-known Maine attorney. He has been general counsel in that State for the Canadian Pacific Railway and the Eastern Trust & Banking Company. He has been closely associated with the growth and development of the Bangor Railway & Electric Company and its subsidiaries for many years. Mr. Ryder was born in Readfield, Me., in 1854. He attended Colby University and was admitted to the practice of law in 1882. He has lived in Bangor since 1894. Mr. Ryder has served in the State Legislature and as solicitor for the city of Bangor for two terms.

Thomas K. Bell has been appointed Civil Inventory Chief, U. S. Navy, with offices in the Bureau of Supplies and Accounts, Navy Department, Washington, D. C. Mr. Bell is now making a survey of the system of inventory used by the General Electric Company, with a view to its development for use by the Navy. From December, 1919, to January of the present year Mr. Bell served as appraiser for the Fourth Naval District. He was formerly general manager of the St. Petersburg Light & Power Company and the St. Petersburg & Gulf Railway, St. Petersburg, Fla. Prior to that time he was for many years engineer of William Wharton, Jr., & Company, Inc., Philadelphia, Pa., and was connected with the Interstate Railways, Philadelphia, and the Philadelphia Rapid Transit Company.

H. C. Stevenson Advanced

Will Represent President McCarter of the Public Service Railway in Southern New Jersey

Harry C. Stevenson has been appointed assistant to the president of the Public Service Railway of New Jersey. Mr. Stevenson will act as the personal representative of President Thomas N. McCarter in the Southern Division of the company's property. He will serve in a similar capacity with the Public Service Gas Company and the Public Service Electric Company. He will make his headquarters at the railway's offices in Camden.

Mr. Stevenson has been connected with the Public Service Corporation of New Jersey ever since its organization in 1903. He began his career in the public utility field in 1897, when he became secretary to the late Thomas C. Barr, then president of the Worcester Traction Company. Later he served as auditor of the Elizabeth, Plainfield & Central Jersey Railway, which was finally absorbed by the Public Service.

H. C. STEVENSON

After serving in a secretarial capacity under several executive officers. Mr. Stevenson, in June, 1907, was made assistant secretary of the Public Service Corporation and of its underlying companies. In April, 1917, he was made assistant to Vice-President Edmund W. Wakelee of the railway.

Obituary

William H. Sayre, president of the American Abrasive Metals Company, died suddenly at his home in Glen Ridge, N. J., on Jan. 6, from a severe heart attack. Before engaging in manufacturing Mr. Sayre was connected with the construction of railroads and at one time was associated with the late John B. McDonald, who had the contract for the construction of the original subway in New York. Later Mr. Sayre was elected president of the International Contracting Company, which executed many important dredging contracts. He subsequently organized and became president of the American Abrasive Metals Company.

B. A. Buckheister, superintendent of railways of the South Carolina Light, Power & Railways Company, Spartanburg, S. C., was shot and almost instantly killed on the evening of Dec. 17 by George W. Putnam, a former employee of the railway. Mr. Buckheister, in a dying condition, was rushed to the Spartanburg Hospital in an ambulance, but expired on the way. Mr. Buckheister was one of the best known men in Spartanburg. He was a native of Charleston, S. C. He went to Spartanburg about twenty-five years ago, and with the late F. W. McEowen had a large part in the building of the railway system in that city. He had been superintendent of the lines since the beginning of operations. Mr. Buckheister was fifty years of age.

Alexander J. Hemphill, chairman of the board of directors of the Guaranty Trust Company, New York City, and a director of a number of utility companies, died at his home in New York recently. Mr. Hemphill was recognized in business and banking circles as one of the foremost financiers in the United States. He had been associated with the Guaranty Trust Company for more than fifteen years, first as vice-president, later as president, and finally as chairman of the board. He was a director of the Hudson & Manhattan Railroad, the Interborough Rapid Transit Company, the Interborough Consolidated Corporation, the United Gas & Electric Corporation, the United Railways Investment Company, the Electric Bond & Share Company, the California Railway & Power Company and of other corporations.

William A. Anderson, secretary to Job E. Hedges, receiver of the New York Railways and secretary to H. H. Vreeland, director of welfare of the Interborough Rapid Transit Company, New York, N. Y., died recently following an operation for appendicitis. Mr. Anderson was born in Toronto, Ont., in 1876. He entered the service of the old Metropolitan Street Railway eighteen years ago as a stenographer in the legal department. Two years later he became secretary to Mr. Vreeland, then president of the company, remaining in this position until the receivership in 1907, when he became secretary for the receivers, Messrs. Douglas Robinson and Adrian H. Joline. When the lines were sold under foreclosure in 1912 and reorganized as the New York Railways Mr. Anderson again became secretary to Mr. Vreeland as director of welfare of the Interborough Rapid Transit Company and the New York Railways. When Mr. Hedges was appointed receiver of the latter company, in March, 1919, in addition to acting as secretary of the department of welfare Mr. Anderson also was appointed secretary for the receiver.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Light Market for Signal Apparatus

Manufacturers Differ on Effect of Safety Cars on Demand—Prices Steady with Good Deliveries

Despite the recent statement of a representative manufacturer of railway signals that his volume of sales for 1920 exceeded every other year since 1911 a survey of the field does not reveal similar conditions. The producer in question attributed his good sales in part to the development of the safety car within the past year or two, and the realization of operating men that the handling of such cars should be made as nearly automatic as possible, especially where one-man cars are operated on single track or with shortened headway.

Other manufacturers, however, do not state that the growth of safety car operation has favorably affected the signal business. In fact several representative producers state that the year 1920 was considerably below the average for installations of signal apparatus, both on steam and electric railways. This is said to be a result of money stringency and the comparatively small mileage of new track laid. Just now the market for signals remains quiet. Whether the present year will result in good sales or not is rather uncertain. Manufacturers are hoping but not expressing overly much confidence as yet. Prospects for electric railway buying are rather indefinite, but a good volume of orders may develop from steam roads.

Manufacturers are in excellent shape to make prompt deliveries. In a few instances at least, standard equipments are being made on a moderate scale for stock. Prices of signal apparatus have undergone no change and there seems to be little prospect of any material change in price at present. Raw material is plentiful but the cost of malleable castings and of cast-iron remains comparatively high; labor is high and the benefits of mass production are not easily obtained in this field.

Good Demand for Gear Cases

Orders for gear cases were good the past year and electric railways have endeavored to anticipate their needs for the present winter so far as their buying power permits. Stocks have remained low following the extra large number of replacements that were necessary last year. Another factor inducing depleted stocks has been the shortage of sheet steel and malleable iron that prevailed for many months. Sheet steel is now plentiful but manufacturers are avoiding stocking it on a declining market. The malleable iron supply while better is still not normal. Prices on malleable cases have remained steady following advances made early in the year owing to increased raw material costs but sheet steel gear case prices have shown a slight break. Deliveries of malleable cases the end of the year were quoted at forty-five to ninety days and sheet iron gear cases at thirty to seventy-five days, with no stocks in sight.

Purchasing of Lightning Arresters Only Fair

Relatively Short Deliveries Can Be Made on Car Types—No Change in Price Reported

Demand for railway type lightning arresters was only fair throughout the year and as a result good deliveries prevailed. Expectations that stocks of lightning arresters which had accumulated previous to the spring demand would be quickly wiped out did not materialize. An important factor in this is thought to be the financial situation in which many of the lines found themselves. It is known that traction companies were more willing to take a chance on not providing protection for cars, especially the smaller safety type in large use. Deliveries in general throughout the buying season varied from stock up to six weeks' time.

Present demand is only spasmodic, although scattered orders are being placed. The buying certainly is not up to normal. There are, however, many attractive inquiries and propositions before the manufacturers and these should come to a head before the spring season.

On the more popular types of car arresters shipments can be made from stock, in small quantities, up to about three weeks, depending on the manufacturer. No changes in price have been reported.

Large Power Stations at Durban

Among the most important government construction work in British South Africa to be undertaken during the next year or two, the United States consul at Durban reports, are the equipping the main line of railroad from Durban to Pietermaritzburg and the building of large power stations along the way, particularly the initial one at Durban. Besides the work mentioned above, the city of Durban has under consideration the construction of a new and much larger power plant.

Easier Supply of Paint Materials Available

Prices in General Have Shown Heavy Decreases—Return of Market Expected to Start Upward Trend

Although electric railways were not especially heavy buyers of paint, enamel and varnish, the market for these materials on the whole remained undersupplied throughout the greater part of last year. The story is one of curtailed supplies of raw material and rising costs due to such factors as the coastwise shipping strike that sent the price of turpentine at New York as high as $2.50 per gallon on April 10. Hence stocks of the finished products remained badly broken, with irregular shipments.

In the last quarter of the year, however, general demand for paint slackened materially, transportation tie-ups eased and the four months' volume of back orders existing in many cases began to be reduced. From that time on deliveries improved, with supplies now available from stock in some cases. Prices have recently been on the down grade, too, under the influence of lowered costs of turpentine and also of linseed oil.

Turpentine is quoted now at 75 cents a gallon, although a couple cents under this price has been taken for some sales. Spot stocks are reported to be not large and it is expected that a good buying movement would soon result in much higher prices. Better buying is looked for soon. White lead in oil in 100-lb. kegs is down to 13 cents a pound in a quiet market. Linseed oil too is holding on a relatively low level, 77 cents a gallon in car-load lots being quoted.

Price reductions on paints of a week or so ago were short lived, and even then there was little activity in the market. Better business is felt to be in prospect in the near future, according to representative paint producers. Higher prices also are looked for in the dry colors, some slight advances already having taken place.

Buying of Car Wheels Has Been Up to Standard

Orders for chilled iron and rolled steel car wheels on the part of electric railways the past year, while not extra heavy, were about up to the standard of other seasons. A distinct tendency is noted, however, to make wheels serve a longer period without making replacements.

Car shortages, which have delayed supplies of fuel and raw material, served to pile up unfilled orders at the factories as long as sixty days, while deliveries in some cases ranged at times as long as three months. The shortage of scrap iron wheels holding over from the war period also served to curtail the supply of chilled iron wheels. These factors were minimized by the wide distribution of wheel factories over the country, however, and by the policy of producers of maintaining reserve stocks for regular customers. As production conditions improved along with freer transportation and better supplies of material orders for wheels were filled in good time. Demand for the most part, of course, was renewal in character.

Steam railway buying, along with that of the traction companies, is such that present mill capacity is going in good shape, and is being added to in certain instances. Especially on the part of steam roads forward bookings are quite heavy. Orders last fall for new rolling stock have provided winter and spring business so that quick requirements on the part of traction companies might only with difficulty be filled.

Insulation Prices Drop

Treated and Untreated Fabrics and Compounds Off About 25 Per Cent

With the general decline in cotton and silk fabrics, there has just been a drop in price of at least one brand of finished insulations, treated and untreated, and in compounds and varnishes averaging about 25 per cent.

Buying of insulating materials is running along on a level only sufficient to keep up with the demand at present existing in the apparatus field. This is quite light as evidenced by the reduction in orders placed with manufacturers of electrical equipment.

Orders for Repair Seatings Rather than Seats

Manufacturers of car seats report a rather light demand for finished seats from electric traction companies in the year just past, but buying of seating material for repairs was fairly good. Many car builders now make their own seats, and this of course affects the demand there somewhat. Steel was very difficult to obtain and seats with steel underframes consequently were slow in delivery, especially those employing plush, leather or imitation leather. These materials were all very scarce.

Rattan, however, remained in fairly good supply, in some cases fair-sized stocks of repair material being maintained, while in others deliveries ranged as long as six weeks during the summer. The latter delay was partly due to a scarcity of ship bottoms with which to transport rattan from the Far East.

At the same time high freight rates prevailed and the cost of native eastern labor has been on the increase. Manufacturing facilities are now good and an adequate supply of car seats and seating material is expected to be available to meet the good demand that seems to be anticipated in the spring.

Armature Coil Market Quiet

Some Companies Have Dropped Price 5 to 10 per Cent in the Last Two Months

Activity in the market for armature and field coils represents only the buying for present needs. To date the winter has been pretty free from snow and this has had a big effect on orders for this equipment for maintenance. At this time a year ago the market was quite reversed and deliveries were longer than at present.

Safety-car equipments are becoming rather standardized and some coil manufacturers have wound for stock to take care of rush orders should heavy storms cause burnouts. On the other hand, from other quarters up to four weeks is required to fill orders for safety cars. For coils to fit the larger types of railway motors from four to eight weeks is the quotation for shipments.

Following cotton and copper prices down at a respectful distance December saw about a 10 per cent reduction in price of these coils in some instances, while in other instances no reductions were made until the middle of January, when a 5 per cent cut was made. From still other directions no change is reported.

General Electric Finds Cut in Force Necessary

With a payroll reported to be the highest in its history, and with bookings of new business at a rate of about $200,000,000 at this time, while early in 1920 they were at the rate of about $350,000,000, it is not surprising to learn that the General Electric Company finds it expedient to make reductions of about 10 per cent in the working force in the factory departments of its various apparatus and supply plants. At the same time there is a sufficient volume of back orders to keep the plants working for several months.

Rolling Stock

The Cleveland (Ohio) Railway, it is reported, will purchase fifty new motor cars and fifty new trailers at a cost of $930,000 if the Council permits the amendment to the company's franchise allowing it to dispose of new stock at less than par.

Franchises

Indiana Service Corporation, Fort Wayne, Ind.—An extension of the city lines of the Indiana Service Corporation of Fort Wayne, Ind., will be made in the Bloomingdale section of the city this coming summer, following the recent approval by the Fort Wayne board of public works of a franchise, giving the corporation the right to lay new tracks on various streets in that city. The franchise calls for the establishment of a line from the present terminus of the Huffman Street line down Franklin Street to Third Street and out Third Street to Runion Avenue. Robert M. Feustel, president of the corporation, expects to begin work on the new tracks within a comparatively short time.

Track and Roadway

Calgary, Alta.—Request for extension of the white car line route in East Calgary from the end of the present line to make a loop round by Twenty-second Street and Seventeenth Avenue will be revived by the East Calgary Ratepayers' Association.

Louisville (Ky.) Railway. — The Louisville Railway plans to take up and relay the curved track at Third and Liberty Streets, Louisville. The work of rearranging the track and shortening the curve will be expedited as far as possible because of traffic congestion and the possibility of accidents resulting from the torn-up condition of pavement.

Louisville (Ky.) Railway.—The Market Street Merchants' Association has placed before the Louisville Railway an offer to build two car tracks a distance of two blocks to connect Third and Jefferson Streets with Third and Main Streets if the railway will route the Indiana interurban cars through Third Street and down Main instead of west on Green Street. No action has been taken on the matter so far.

New York, Westchester & Boston Railway, New York, N. Y.—It is expected that the New York, Westchester & Boston Railway will extend its electric line to Port Chester. This is a step in the project to connect New Rochelle and Larchmont. The route for this line runs parallel to the New York, New Haven & Hartford system and so far the plans include a double-tracking to Larchmont.

Dallas-Terrell Interurban Railway, Terrell, Tex.—Citizens of Terrell, Tex., have taken action looking to insuring the building of the proposed Dallas-Terrell interurban line, which has been considered as one of the lines to be built by the Dallas Railway under its commitments to the city of Dallas. A committee of Terrell citizens has been appointed to secure right-of-way for the line from Forney to Terrell, a distance of about fifteen miles. Citizens of Forney will guarantee right-of-way from Forney to the Dallas County line.

Dallas (Tex.) Southwestern Traction Company.—E. P. Turner, president of the Dallas Southwestern interurban, organized to build from Dallas to Irving, thence to Cleburne and Glenrose, has requested an extension of time from the City Commission of Dallas for building the line. Mr. Turner explained to the commission that he had been unable to complete financial details, and that he had found it impossible to complete the line within the time set. Eight miles of the line have been graded, but no other work has been done. The extension of time has been granted.

Houston (Tex.) Electric Company.—The Houston Electric Company will agree to remove its tracks from Main Street and lay new double track line on Fannin Street, one block removed, if the public desires such a change, Luke C. Bradley, district manager for Stone & Webster, has told the Houston City Council. Mr. Bradley asked, however, that the tracks be left on Main Street for the time being and that the Fannin Street route be tried as an experiment until the general public had decided if they preferred Fannin Street to Main Street. Mr. Bradley's proposition was accepted by the City Council. The removal of the tracks to Fannin Street will cost about $200,000.

Peterborough, Ont.—The construction of a suburban car line on Monaghan Road is being urged on the Utilities Commission.

Hydro-Electric Power Commission, Ont., Canada.—A by-law to turn over to the Hydro-Electric Power Commission of Ontario the management and operation of the local street railway in Guelph for a term of fifty years was carried by ratepayers.

Power Houses, Shops and Buildings

United Railways Company, St. Louis, Mo.—Special Master Lamm in the receivership of the United Railways of St. Louis has announced that he will recommend to the United States District Court that Receiver Rolla Wells of the railway company be authorized to spend approximately $325,000 for the installation of five automatic substations for the distribution of power.

Interstate Public Service Company, Indianapolis, Ind.—The Interstate Public Service Company has notified the Public Service Commission of Indiana that within thirty days the company will begin service over a new high tension, single-phase electric power line from a plant at Monticello toward Logansport. The company will serve Idaville and Burnettsville, in White County, with electric power. This line will be a three-phase eventually.

Interstate Public Service Company, Indianapolis, Ind.—Announcement has been made by officials of the Interstate Public Service Company that in a short time a part of the electric current used on transmission lines in southern and central Indiana will be supplied by the water-power generating station at Keokuk, Iowa. The Interstate Company operates three transmission lines out of Seymour, Ind. One extends to Indianapolis, another to Louisville, and a third to the company's water power station at Williams, in Lawrence County. Before the transmission lines were constructed the company maintained a generating plant in each city.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—The Salt Lake & Utah railroad has ordered from the Westinghouse Electric & Manufacturing Company equipment for a 500-kw. automatic substation. The converting equipment consists of an induction motor driving a 500-kw. 1,500-volt direct-current generator.

Trade Notes

The Yale & Towne Manufacturing Company, Stamford, Conn., has made arrangements for increasing the manufacturing facilities of its chain block and electric hoist works at Stamford.

E. A. Palmer has been appointed manager of the railway division of the San Francisco office of the Westinghouse Electric & Manufacturing Company.

H. M. Byllesby & Company, 208 South La Salle Street, Chicago, investment bankers, engineers and managers, are distributing a new booklet describing the scope and services of the organization.

Vinton Smith, who has been connected for several years with the San Francisco office staff of the Standard Underground Cable Company, has been appointed assistant Pacific Coast manager, reporting to Richard G. Harris.

The Allen-Bradley Company, 284 Greenfield Avenue, Milwaukee, Wis., has increased its authorized capitalization from $186,000 to $250,000 to provide for expansion to its business. The company manufactures electric control devices.

The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., announces the opening of a St. Louis office in the Railway Exchange Building, in charge of Harold Phillips, formerly of the engineering department of Chicago and later office manager of the Chicago office. This new office is a branch of the Chicago district office.

The James T. Hessel Company, New Haven, Conn., has been appointed distributor for the State of Connecticut for the "National" renewable fuse. This recently established organization, with headquarters at 19 Prout Street, New Haven, has just enlarged its warehouse to accommodate a complete stock of pole-line hardware, crossarms, etc.

National Railway Appliance Company, 50 East Fourty-second Street, New York City, with branch offices in Boston and Washington, and the Hegeman-Castle Corporation, Chicago, Ill., announce that the selling agency for the Clapp Fire Resisting Paint Company, Bridgeport, Conn., has been discontinued as of Jan. 14.

The Great Western Contracting Company, Kansas City, Mo., representatives for the Conveyors Corporation of America, Chicago, has changed the name of its organization to the Rawlings Industrial Equipment Company. This organization is sales engineer for the manufacturers of power plant machinery. The Rawlings Industrial Equipment Company, besides handling coal and ash conveyors, is also representative of the Springfield Boiler Company and the Cooling Tower Company.

The Foreign Trade Supply Corporation has been organized with its main office at 17 Battery Place, New York City, of which E. C. Morse, former director of sales, War Department, is president, A. LaMar, former assistant director of sales, War Department, is vice-president and Paul Klopstock is chairman of the board of directors. The corporation will engage in a general merchandise brokerage exporting and importing business and in the buying and selling of foreign securities.

International G. E. Moves Headquarters.—The headquarters force of the International General Electric Company, Inc., which has been housed in the main office building of the General Electric Company, has just moved into its new office building erected on what was formerly the Westinghouse property on River Road, Schenectady, N. Y. This change places under one roof about 400 persons in the following departments: Executive, European, the Americas, Far East, merchandising, service and accounting. The building is six stories high with a basement under half of it. The total floor space is approximately 70,000 sq.ft., each floor being about 60 ft. x 220 ft.

Robert E. Horton, Harry Barker, and **Robert C. Wheeler** have become associated under the firm name of Horton, Barker & Wheeler, to continue their consulting engineering practices formerly carried on under the names of Robert E. Horton, consulting hydraulic engineer, Albany, N. Y., and Harry Barker and Robert C. Wheeler, engineers, New York City. The new company will have its headquarters in Albany, N. Y., with offices in New York, Harrisburg, Pa., and an engineering laboratory at Voorheesville, N. Y. It will specialize in power development and transmission, water supply, sewerage and sewage disposal, public utility rates and valuation.

New Advertising Literature

Industrial Locomotives.—Bulletin No. 44251 of the General Electric Company is on locomotives for "Industrial Haulage."

Car Seats.—Supplement to the reversible-seat bulletin No. 246 gives "Improvements in Brill Winner Seats," published by The J. G. Brill Company, Philadelphia, Pa.

Heavy Oil Engines.—The Dodge Sales & Engineering Company, Mishawaka, Ind., has published a small catalog describing its heavy oil stationary engines, heavy oil marine engines and heavy oil engine-driven electric generating units.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors   HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor   N. A. BOWERS, Pacific Coast Editor   H. S. KNOWLTON, New England Editor   C. W. SQUIER, Associate Editor   C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative   A. D. KNOX, Editorial Representative   GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor   W. B. ANDERSON, Assistant News Editor

Volume 57   New York, Saturday, January 29, 1921   *Number 5*

Chicago Conference Will Teach Several Important Lessons

A READING of the announced program of the association's annual mid-year conference will bring vividly to the minds of electric railway executives some of the difficulties which they have confronted in the past few years in trying to keep up the supply of ready money with which to meet current obligations. President Gadsden's personal letter urging executives to attend this conference has elicited many replies which show the vital interest that is taken in this all important subject at the present time.

While the financial condition of the industry is somewhat improved over that existing a year ago, it is nevertheless far from satisfactory. Even now the number of companies in the hands of receivers is larger than at any previous time in the history of the industry. It seems incredible that ninety-one companies, involving 11.2 per cent of the electric railway mileage and $819,429,294 of securities, in such an essential industry as this are unable to meet fixed charges. These are the facts, however, and they form one basis for the expectation that the lessons to be learned by attendance at Chicago will prove materially helpful in pointing out past pitfalls that are to be avoided in the future.

Reasons for the Automatic Substation's Growing Popularity

PRACTICING economy has been the favorite indoor sport of electric railway officials since the day when the obsolescence of the nickel fare came to be recognized. Every department of the industry has been diligently searched for the purpose of locating and checking waste and inefficiency. In this connection probably no single development of recent years has been more promising than the application of automatic control to electric railway substations. The history of this development has been traced in numerous articles appearing in this paper during the past few years, and it was brought up to date in the table of recent installations and orders which appeared in the issue of Jan. 22.

The "automatic" has attracted the attention of managers primarily because it promises saving in labor costs, which are reduced to those of inspection and maintenance. But there are numerous other items which are almost equally attractive. Substantial savings in transmission line copper are rendered available, and better voltage distribution follows naturally.

The substantial number of new automatic installations is a tribute to the work of the engineers, who have had to overcome many difficulties in bringing about its present status. The showing is remarkable in the light of the "hard-up" condition of electric railways. In spite of the prevailing tendency to curtail outlay, however, the railways have found means to purchase this money saver on a reasonably large scale, partly because it can be shown in general to have a capacity to finance itself very promptly. It is extremely unfortunate that on every property this money-saving capacity cannot be demonstrated.

Of course the automatic substation has a well-defined field, and it cannot be expected to furnish the solution of all distribution difficulties, many of which may have been the result of faulty design. It is, however, no longer an experiment. It has made good or, obviously, its adoption would have been neither so rapid nor so widespread.

Business Men Vote Unanimously for the Electric Railway

EVERY question put by the United States Chamber of Commerce in its Referendum No. 33 has been decided overwhelmingly in favor of the electric railway. This vote was cast during December by the active business men in the various communities throughout the country. They have no interest in electric railway affairs except as they consider the electric railway as a factor in the prosperity and business life of the community. In this vote the electric railway privately owned and operated was judged upon its performance as compared to the jitney bus and what might be expected from the municipal railway. The issue was well defined, and the jury was clearly representative of the best commercial thought of the country. It was the first time that the subject of the treatment to be accorded electric railways by the local authorities had been considered by a group so representative of the intelligence of the country.

What was it that the members of the Chambers of Commerce decided? It was that the electric railway was the most practical agency of city transit on a large scale, at least at present; that it should be kept under private ownership, protected from unfair competition and relieved of burdens not connected with the service performed, and that the effect of changes in operating conditions should receive proper recognition on the part of regulatory authorities. This treatment, they further said, should be met by the company in its turn making available for the public at all times the facts as to the results of operation, and by having resident responsible executives wholly conversant with local requirements.

It is not difficult to imagine the consternation which this vote will bring to the politicians, the Mayor Hylans, and the lesser lights of their ilk. Their stock in trade for years—that is to say, theirs and their predecessors—has been to persecute and oppress the street railways, to add to their taxes, to start opposition bus or trolley lines, to berate the managements and when possible to stop any advance in fares. They have pursued these policies because they thought it a popular thing to do, that it would bring votes. Practically everybody, they argued, disliked the trolley company because it was a monopoly. No abuse was too strong to use against it, no attack too severe. Now, what can they do? These very things which they have always thought were so popular have been condemned by the business vote of the nation. It is not the first time in real life as in fiction that the ugly duckling has proved to be a swan or the rejected stone has become the head of the corner.

But electric railways cannot simply accept the verdict and do nothing. If the electric railway is to be an important support to the local business structure in each community it must fulfill its duties and live up to its opportunities. If the public accepts the principle that the fare must be raised if necessary to give the railway a reasonable return, the company must be ready to give good service for that fare and reduce it when the return is excessive. If jitney and bus competition is abolished to help the railway, it must be ready to extend its service by bus or car when the traffic to be gained on any route warrants such expansion. If the community demands responsible resident executives in place of distant direction by holding companies or bankers, the owners must be prepared to adopt this policy.

Nevertheless, the report of the United States Chamber of Commerce and the vote upon it should be of the greatest help now to electric railways. It should help greatly to bring about wider recognition of the railways as public servants and as worthy of the esteem of the community. Railway executives cannot do better than to bring this vote to the attention of their communities as a whole. When considered with the report of the Federal Electric Railways Commission it represents the greatest advance in public recognition of the electric railway which has occurred in years.

How the Camden Section Will Help the Public Service Railway

WHEN Martin Schreiber, chief engineer of the Public Service Railway, was appointed manager of the Southern Division of that property, he immediately decided that one of the first things to be done was to organize a company section with headquarters at Camden. Public Service was one of the pioneers in the company section movement and the results achieved at Newark, the company's main headquarters, showed what could be done at Camden. The activities of the new section were formally inaugurated on Jan. 13 with the enthusiasm which always marks the launching of a new enterprise of this sort. The event is significant because it is nearly three years since a new company section was formed, the latest preceding one being the Rhode Island company section. It is to be hoped that this will precipitate the formation of other sections which have been under discussion for some time, but which had to wait until after the war excitement had died down. Unfortunately, the Southern Division of the Public Service Railway is not large enough to have permitted the formation of a section which could capture the trophy cup presented to the association by the ELECTRIC RAILWAY JOURNAL. The Rhode Island Company section, which holds this cup, started off with such a rush that it secured a remarkably firm hold on the trophy. It is about time, however, that a section should be formed somewhere to lift the cup from its resting place in Providence.

In the meantime the best wishes of the industry will be extended to the infant section at Camden.

An Opportunity and an Obligation at Chicago

WHAT is to be done at Chicago with reference to President Gadsden's recommendations that the association, speaking for the electric railway industry, take action endorsing, or at least defining its attitude toward, the reports of the Federal Electric Railways Commission and of the special committee of the Chamber of Commerce of the United States? As noted in the Jan. 15 issue of this paper (see page 146), President Gadsden has addressed a letter to executives of member companies on this subject and has appointed a committee to bring in a report with recommendations for action at Chicago on Feb. 10. Believing that a discussion of this subject would tend to crystallize opinion, the editors of this paper have asked several members of the Committee of One Hundred and the chairmen of some of the public service commissions who have most to do with electric railway regulation to comment, in this issue and the next, on the probable effects, good and bad, which would result from the endorsement of, or other action on, these two reports.

The position of ELECTRIC RAILWAY JOURNAL on this question can be expressed in a few words. It is that the endorsement of these reports as bases for the electric railways, individually and collectively, to meet the public and work out the details of individual or collective problems would be the greatest and most important single step which the association could take at this time in the effort to restore the industry to a stable and successful status.

The situation is just this: two disinterested bodies, one appointed by the President of the United States, the other representing organized business of the country, the United States Chamber of Commerce, have fully analyzed and reported on the electric railway industry both as to present situation and as to bases upon which future relations should be founded. These reports represent, probably as accurately as can be ascertained, the intelligent opinion and conclusions of the public regarding electric railways. The electric railways, as an industry, have not spoken with reference to these reports. Are they good or bad? Are the railways ready to meet the public on the bases outlined in these reports? Is not the public entitled to know what the railways believe?

Objection to action endorsing these reports is urged by some because the former report mentions service at cost. Others say they cannot in fairness to their properties and security holders reorganize their capital structures over night. But, upon examination of the reports, there is no definite requirement along either of these lines. What these reports do present are fair analyses of the electric railway problem and recommendations and conclusions as to bases upon which future railway operation, financing, franchises, public relations, legislation, etc., should be based. With these conclusions and recommendations no one can differ fundamentally.

Endorsing action compels no one to modify capitalization over night, though such action may in many cases be advantageous. It compels no railway to adopt service at cost now or tomorrow. It does do this—it says to the public, "You have analyzed the railway situation thus and so as indicated by these reports. We believe these reports are fair and are willing to go along with you in the working out of the problems on the bases of these reports, relying on you to do your part." Endorsement is the railway's step in the co-operative action. At present the next step is up to the railways in speaking frankly. By endorsement of these reports, by announcement of their own position as being in line with the public's own analysis, and by action in accordance therewith, the railways "put it up" to the public for real action on its part in the common problem.

Local fears, local details, should not be allowed to becloud the main issue, which is the beneficial, psychological and strategic effect of the association's stating its position with reference to these reports.

It is to be hoped, sincerely, that President Gadsden's special committee will recommend action endorsing the reports and that the association will decide that such action is the most frank and sound move which it can now make.

Governor Miller Takes Up New York City Traction Affairs

GOVERNOR MILLER'S report on traction affairs, sent to the Legislature Monday afternoon, outlines a constructive plan. This is most refreshing after four years of drifting and evasion. Briefly stated, the position of Governor Miller follows:

Owing to an unfortunate division of responsibility in the past between the city and state, the transportation system in New York has been allowed steadily to drift toward disaster. Many roads are in the hands of receivers, many lines have been abandoned, maintenance has been deferred, taxes are unpaid and service has deteriorated, all to the inconvenience and expense of the public and great loss to the city. Yet transportation is a public function, intimately affecting the public welfare, and upward of $850,000,000 of New York City's traction bonds are held by the public. This includes $250,000,000 of city bonds. The time has now come for action, and it would be little short of a public calamity if the opportunity thus presented were allowed to pass. The remedy is a unified system with a single fare and with unnecessary duplication of service eliminated. This means the subways will be the backbone of the system, with the elevated, surface lines and buses eventually merely auxiliary. The subway contracts, with their preferential payments, must be revised; the length of leases is too long. Ultimately such a system would be municipally owned. The State has the duty and the power to act in the matter, and a commission of three is recommended to take over the work of the present city commission and to receive such additional power as may be necessary to extricate the situation from its present difficulties and accord exact justice to all.

The situation is well stated, and we are glad also that the Governor sees the necessity of a co-ordinated system in the proposed revised plan for New York. In this way only can the maximum service be given for the minimum cost to the users, although it would be well in this complete revision of existing conditions to see whether some sort of distance fare cannot be introduced. The reference to ultimate municipal ownership need not cause alarm. This was the ultimate outcome of the present subway contracts, and the Governor in a later statement declares he is opposed to municipal operation. He simply wishes to have all of the means of transportation on the same basis.

But the companies also must make concessions. The subway contracts, the Governor says, need revision in the public interest as experience has shown that the provisions for preferential payments are unfair to the city. Just how far the concessions requested will extend is impossible to say, but the tone of the message throughout indicates a strong desire to administer justice, and the companies have the assurance that in the Governor's opinion the market value of the outstanding securities is much below the intrinsic value of the properties represented. It will certainly mean a great deal to the companies, just as it will to the city, to rewrite their contracts in the light of the experience of the past ten years. We hope for much from the new commission which the Governor asks authority to appoint to undertake this work and that this commission will have ability and power to reach a correct solution. There is probably no other problem in civic affairs in New York whose correct settlement is so important as this.

A Wondrous Novel Reason for Re-election

THE ordinary run-of-mine candidate for the Mayoralty of an American municipality generally considers a promise to make the local electric railway suffer to be a positive claim on the votes of the citizenry. Not so the gentleman who has been Mayor of Terre Haute for three years and likes the job well enough to seek another term. Does he threaten dire things to the street railways? No, not he! Mayor Hunter gives as one of his strongest arguments for re-election the fact that during his administration the local railway has given no trouble at all, at all. Listen to this, ye unhappy managers in Hylanized communities:

"Although our people may not realize it, we have as good a street car system as there is to be found in the country, and in the face of raising of fares all over the country our people ride at 5 cents. In other cities the fare has been advanced to 7, 8, 9 and 10 cents for city fares. Our people save thousands of dollars every year on street car fares alone."

This certainly seems like shining in the glory reflected of the able management of Edward M. Walker, but in all due fairness to Mayor Hunter let it be said that as one of the first municipal executives to appreciate the value of safety car service he has not only co-operated to such good effect with the railway of his home town but has advanced the cause of better service in many other cities through the hearty, unequivocal way in which he has endorsed the principles of Terre Haute operation when questioned by the numerous civic committees that have visited that city to study the safety car. If Mayor Hunter's record in other directions is as good as this, he ought to be re-elected by acclamation.

Quotation from the Federal Electric Railways Commission Report

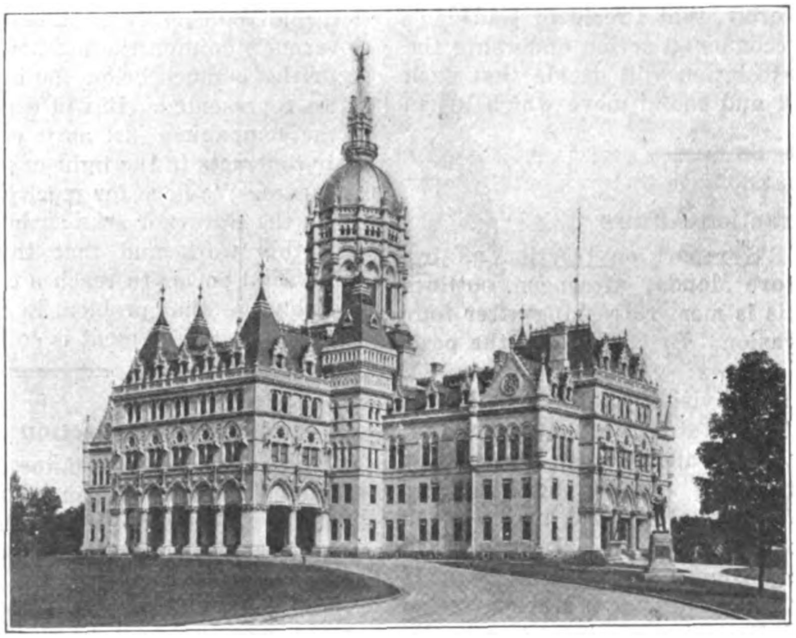
No. 5

THE industry can be restored to a normal basis only by the introduction of economies in operation, improving the tracks, equipment and service and assuring a reasonable return upon the fair value of its property used in the public service when honestly and efficiently managed.

For the purpose of restoring credit, it seems to be the general impression of all witnesses that the first necessity is for the industry to put into effect such economies of operation as will enable it to give good service at the lowest cost.

The Public Utilities Commission of the Nutmeg State

The Connecticut Commission Is Restricted as to Jurisdiction Over Rates and Securities — It Follows a Conservative but Broadminded Policy — It Is Particularly Vigorous in Requiring Effective and Safe Operation of Utilities — Grade Crossing Protection Signs Worked Out in Connecticut—This State Apparently Antedates Massachusetts in Utility Regulation



THE CAPITOL AT HARTFORD IS AN ARTISTIC GILT-DOMED STRUCTURE IN A BEAUTIFUL CITY

THE State of Connecticut has had some sort of a regulatory commission ever since 1849. In that year the Legislature provided for the appointment of three commissioners for each railroad in the state, each to serve three years. Their duties were to examine the roads each year, to see that the companies observed the laws and the provisions of their charters, to hear the complaints of selectmen of the towns, to adjust land condemnation proceedings, etc. Massachusetts is usually credited with having started the regulation idea, but she did not establish a commission until 1864, fifteen years later than Connecticut. In 1850 the law of the previous year was amended in such a way as to provide that the individual commissioners should constitute a board; at the same time the duties were somewhat enlarged. Various other amendments in 1853, 1858, 1865, 1874, 1877 and 1888 enlarged and defined the scope of the commission until it had the usual character of jurisdiction over service and operation. Street railways in 1895 came under the regulation of the Railroad Commission.

One of the early amendments required the commission to investigate accidents occurring on the railroads. The first entry in one of the oldest record books of the Railroad Commission existing in the files of the present commission is the following, not quite as precise and formal as those reports received now from the utilities, but probably as effective:

Rec'd
June 26, 1857

Augustus
Lagerhauser

Killed

Office—Hartford, Providence &
Fishkill Railroad
Hartford, 24 June, 1857

H. Hammond, Esq.

Dear Sir: As our evening train was passing Bristol north side last night it ran over a German, injuring him so that he died in course of night. There seem to be various reports as to the cause of it, many thinking it was suicide, and others thinking it was caused by intoxication. I will give you the particulars hereafter.

Yours respectfully,
Samuel Nott,
Sup't. H., P. & F. R.R.

A State Inspector of Gas was provided for in 1874 in a law which prescribed standards of gas quality, pressure, candlepower, etc., and this officer, with various local deputies, administered the gas laws until 1911.

In 1911 the Public Utilities Commission superseded both the Railroad Commission and the Inspector of Gas, and at the same time the jurisdiction was extended to include communication, light and power, transportation, and water utilities as well as steam railroads, street railways and gas companies. Soon afterward the term "common carrier" as employed in the 1911 act was defined by the Legislature in such a way as in effect to exclude from the jurisdiction of the commission steamboat lines, pipe lines, tank and refrigerator service, parlor car service, stage and bus lines, irrigation, warehouses, etc. Municipally owned utilities are also entirely excluded.

At the present time 180 companies report to the commission; their total plant investment is $1,030,337,207.98, of which some $350,000,000 represents investment in Connecticut. The total is distributed as follows:

Gas	$23,479,028.67
Electric	37,372,132.60
Express	33,284,724.07
Railroads	295,622,443.84
Street railways	98,232,660.22
Telegraph	166,957,003.14
Telephone	348,830,167.83
Water	26,559,048.11

Originally the three members were required by law to be respectively a lawyer, a civil engineer and a business man. The 1911 acts did not prescribe this, but subsequent appointments have been so made that each of these three professions has continued to be represented. The present incumbents are Richard T. Higgins, chairman; Charles C. Elwell and Joseph W. Alsop, with professions in the sequence given above. Nominations are made by the Governor for a six-year period; in case the nomination is not confirmed by the Legislature, the appointee serves only until the rising of the next Legislature. The salaries at present are

$6,000, $5,000 and $4,000 respectively, although in the establishing act of 1911 each was fixed at $5,000. The offices of the commission are in the State Capitol at Hartford.

FUNCTIONS OF THE COMMISSION

The duties imposed by law are little different from those performed by other utility commissions, but the exercise of power is relatively limited, as was also noted above in connection with the range of utilities regulated.

1. *Rates.*—The law requires that rate matters shall be taken up only on formal petition alleging the rate to be unreasonable; the commission cannot begin a rate investigation on its own initiative. The law does not even require the utilities to file changes in rates; most companies, however, are conforming to the practice of keeping the commission informed of the promulgation of new rate schedules.

2. *Service.*—The commission is authorized to prescribe standards of service for all utilities. It also has the power to inquire into an allegation of inadequacy of plant or equipment of a utility and make such orders as public necessity seems to require.

3. *Safety of Public and Employees.*—The commission, as was the Railroad Commission soon after its establishment, is charged with the duty of examining into the circumstances and causes of utility accidents, involving personal injury or public safety, recommending, if possible, means whereby similar accidents could be avoided in the future.

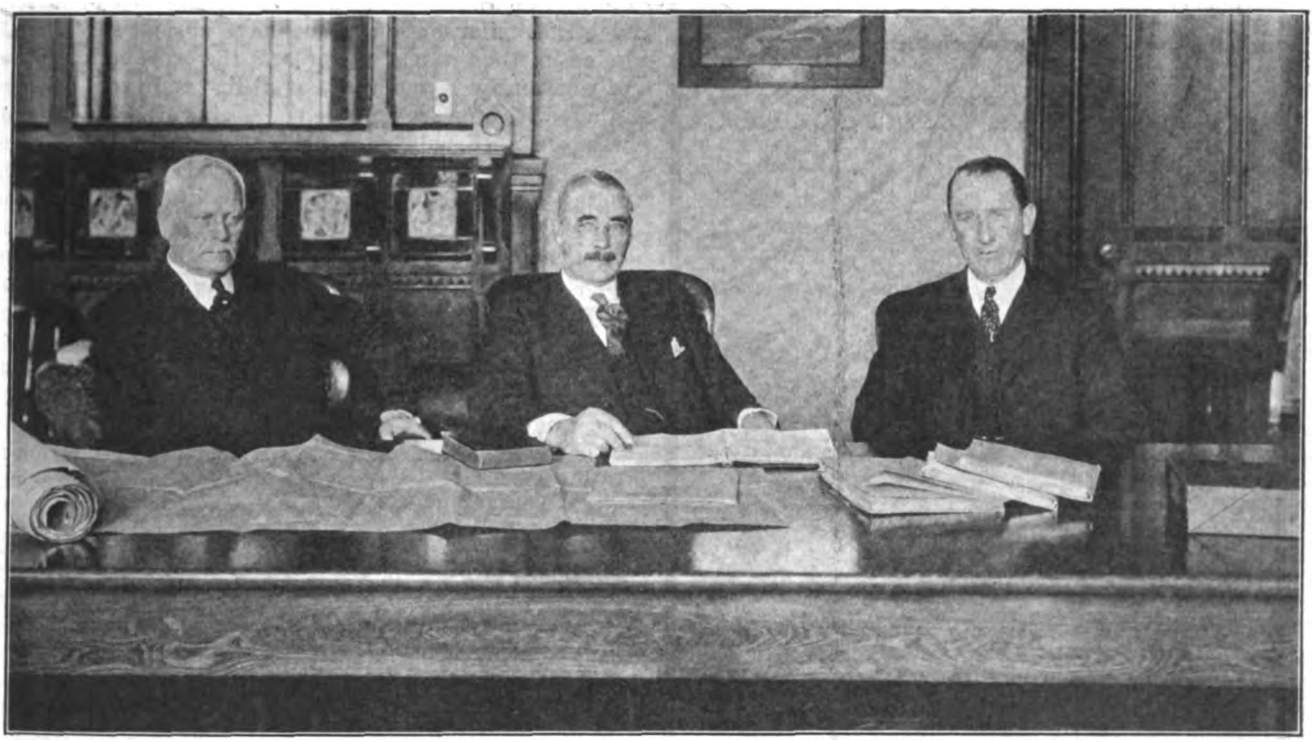
4. *Issue of Securities.*—Only in a few minor instances (resulting from amendments of utility charters) does the commission have any control over the issue of new securities.

Any party aggrieved by any order, authorization or decision of the commission may appeal to the Superior Court, and the ruling of that court stands unless successful appeal from its decision is made to the Supreme Court of Errors, which is permitted to rule only on questions of law and not of fact. Trustees or receivers of utility corporations succeed to all the powers, duties and obligations of company officers relative to the commission except in so far as these may be inconsistent with such powers, duties and obligations as agents of the court appointing them. The bearing of this upon the status of the street railway industry in Connecticut will be touched upon later in this article.

ORGANIZATION OF THE COMMISSION

The routine work of the commission is conducted through the medium of the following organized departments.

Secretary's Department.—Henry F. Billings has been continuously secretary of the Railroad Commission and the Public Utilities Commission since 1893. In the work of conducting the correspondence and files, preparing assignments for hearings and for the engineers he is assisted by an official stenographer and two clerks. Many minor matters are handled directly and expeditiously in an informal way, with the occasional assistance of the auditor or engineers, without resorting to formal hearing and ruling on the part of the commission.

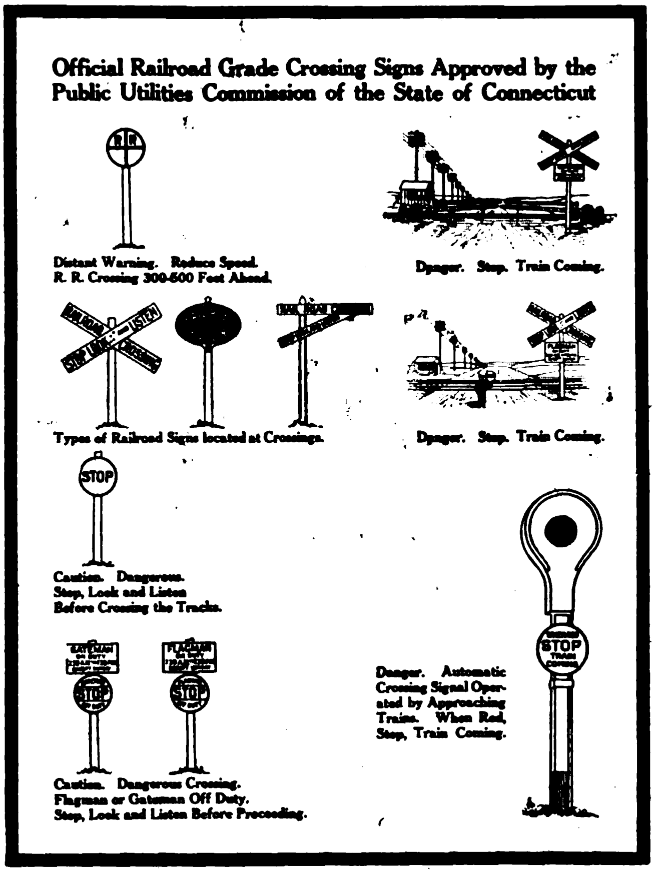


CONNECTICUT'S PRESENT COMMISSIONERS, CHARLES C. ELWELL, RICHARD T. HIGGINS, CHAIRMAN, AND JOSEPH W. ALSOP

Accounting Department.—Edward Field is statistician and auditor. He examines the financial reports made annually by the utilities, prepares the financial and statistical portions of the annual report of the commission to the Governor, makes special investigations of utility accounts and special statements of utility experience as required from time to time by the commission. The auditor has the aid of one clerk.

Engineering and Inspection Department.—The engineering staff consists of three engineers, E. Irvine Rudd, chief engineer; Joseph P. Wadhams, assistant engineer, and A. E. Knowlton, electrical engineer. The engineers make an annual inspection of the tracks, overhead construction and signal systems of the steam and electric railways and occasional inspection of plant and equipment of other utilities. The inspection of the street railways is made in the spring or summer of each year, all lines being covered on special cars, the engineers of the commission being accompanied by representatives of the companies concerned. On this inspection attention is paid to the general physical condition, the riding qualities of the track, maintenance of the electrical distribution system, functioning and adequacy of signal systems and operating signs.

The steam railroads are inspected in the autumn of each year by special train in company with officials of the railroad to determine the physical condition and the adequacy of signal and gate protection at grade crossings of the railroad with highways.


Official Railroad Grade Crossing Signs Approved by the Public Utilities Commission of the State of Connecticut
R R
Distant Warning. Reduce Speed. R. R. Crossing 300-500 Feet Ahead.
Danger. Stop. Train Coming.
LISTEN
STOP
CROSSING
Types of Railroad Signs located at Crossings.
Danger. Stop. Train Coming.
STOP
Caution. Dangerous. Stop, Look and Listen Before Crossing the Tracks.
GATEMAN
FLAGMAN
STOP
STOP
Danger. Automatic Crossing Signal Operated by Approaching Trains. When Red, Stop, Train Coming.
STOP
TRAIN COMING
Caution. Dangerous Crossing. Flagman or Gateman Off Duty. Stop, Look and Listen Before Proceeding.

RAILROAD GRADE CROSSING SIGNS AND SIGNALS, NOW STANDARD IN MOST STATES

Whenever any accident occurs attended with serious or fatal personal injury or involving public safety the utilities make immediate report by wire, followed by written confirmation, and an engineer makes an investigation for the purpose of determining the circumstances and causes, reporting such recommendations as will in his opinion be the means of preventing similar accidents in the future. The department is on call at all hours in order that as prompt as possible an investigation may be made.

The engineers are called upon to investigate complaints arising from the service or safety practices of any of the utilities.

Meter and Service Testing Department.—The testing of gas, electric and water meters and investigations of gas quality, electric service, etc., are performed by the electrical engineer. The commission has established rules and regulations governing service and practice of these utilities and for the purpose of making meter tests upon complaint has established necessary laboratories. The gas laboratory is located at the Capitol and is equipped not only to test meters but to test gas for heating value, candlepower, purity, pressure, etc. The electrical laboratory is located at the Sheffield Scientific School of Yale University in New Haven and the equipment comprises refined electrical instruments and facilities, including a sine wave alternator; the electric companies are required to send in their primary standards once every six months for checking and resealing.

In 1917 the commission established rules and regulations governing the joint use of wood poles by several utilities in the streets and highways after a series of accidents to linemen and pedestrians had indicated the urgency of standardizing the relative locations of electric light and power, telephone, street railway and other circuits on the poles, as well as the method of attachment. Similar specifications have since been promulgated in other states. At present the order is in process of revision by a committee of utility engineers co-operating with the commission's electrical engineer and when reissued will be accompanied by additional rules covering joint construction on wood poles of higher voltage circuits, others specifying standards for the crossing and paralleling of high-voltage lines with other lines, highways and railroads, and still others governing the precautions to be taken to insure safety of employees working on lines and equipment whether energized or de-energized. The method and manner of construction of all new work or reconstruction of higher voltage lines must be approved by the commission and the line inspected before energizing.

The commission has always stressed the protection to be provided by the railroads at highway grade crossings and early in its existence the chief engineer, C. C. Elwell, now commissioner, gave much time to the development of various signs, visible and audible signals, painting of gates with diagonal slashes, etc. The effort to assure maximum protection to the traveler on Connecticut's much-traveled highways was vigorously furthered by the railroads themselves and the signs and signals adopted then have been recognized as standard by the railroad associations and other state commissions. The examinations of these signs and signals is made an important part of each annual inspection of the railroads. So important is this whole matter of grade crossing protection considered that the railroads are required to report regularly to the commission all failures of audible and visible audible signals, with complete details as to the causes, duration of failure, etc. The maintenance of these signals is now of such a high order that they are on practically the same plane of reliability as those employed by the railroad for the movement of trains.

THE STATUS OF THE STREET RAILWAY

Connecticut has nine street railway companies with a total operated mileage of 750 on the single-track basis. Of this amount almost 600 miles is operated by the Connecticut Company. During the last two years 69 miles of track have been abandoned, 61 of which had been operated by the Shore Line Electric Railway. Financial statistics summarized for all the companies for the year ended Dec. 31, 1919, are as shown in the table on page 213.

The 1919 Legislature foresaw this situation and directed the Public Utilities Commission "to investigate the conditions under which the street railways of the State are operated and to report its findings to the General Assembly at its January session, 1921, together with such recommendations and suggestions with respect to legislation as it may deem proper and advisable in order to place such street railways upon a safe and efficient operating basis." In proceeding to carry out this mandate the commission decided to have made an approximate valuation of the physical properties of each of the systems and also a thorough study of the financial and corporate history of each. Unfortunately the Legislature did not appropriate any special fund for this purpose and it was therefore necessary for the three engineers and the auditor to perform the work themselves, with only occasional technical and clerical assistance. A somewhat novel method of arriving at sufficiently accurate estimates of the various pieces of physical plant was developed and as a result some $50,000,000 of property was evaluated at a cost to the commission of less than $10,000, proportions in contrast with the usual cost of such undertakings. The costs to the companies in supplying information and assistance was of the same order of magnitude.

With 80 per cent of the mileage the Connecticut Company attracts the most attention both in Connecticut and outside. This company was formed by the New York, New Haven & Hartford Railroad from many local companies in furtherance of President Charles S. Mellen's scheme to have under one control all the rail and water transportation agencies of New England. Suit brought by the federal government to dissolve this combination as one in restraint of trade led to the court's appointing in 1914 five federal trustees, acting as a board of directors, with a total salary list of $31,500 annually, of which amount the Connecticut Company pays $16,500 and the New York, New Haven & Hartford Railroad the balance of $15,000. There was thus created an annual expense of $31,500 for such supervision as is usually performed by a board of directors without pay. The trustees were authorized and directed to sell and dispose of the stock of the Connecticut Company, but although nearly seven years have elapsed, no part of the stock has yet been sold and the company and its managerial policies are under the direction of these trustees. Of course, the trustees are not authorized to sell the physical property or any part of it.

STATISTICS OF CONNECTICUT ELECTRIC RAILWAYS

Total revenue	$13,309,736.67
Total operating expenses, including taxes	12,297,698.56
Net operating revenue	1,012,038.11
Income from auxiliary operations	357,215.33
	1,369,253.44
Rentals, interest on funded and unfunded debts, etc.	1,899,852.07
Total deficit	$530,598.63

This limitation, this provision by the court that only the stock and that none of the physical property of the company may be sold, has made it difficult, in the eyes of the commission, to work out the best policy for the Connecticut Company and the public to pursue in their mutual relations. As noted previously, the trustees are not subject to the commission on matters falling within the duties and obligations imposed by the court appointing them. The commission has felt this to be so great a limitation that it has recommended to the Legislature that the Attorney-General be empowered to request the court to discharge the receivers and return the stock and management of the company to the New York, New Haven & Hartford Railroad.*

Until the work of appraising the street railway properties was undertaken the commission had done little more in the line of valuation than was demanded by cases that arose. In general the practice of the commission in these few cases has been to secure a reproduction new figure for so much of the property as is used and useful in serving the public and then consider depreciation deduction along with the so-called intangibles in the light of the company's origin, history, experience and immediate and future needs. The commission, in estimating future operating expenses and revenues, has never imposed specifically either the straight-line or sinking-fund method of depreciation accounting, rather treating each case by itself and generally leaving the details to the corporate management.

Industrial Socialization in Germany

IN A RECENT communication from the Berlin correspondent of this publication there is extended analysis of the present move toward socialization of the industries, particularly the coal mines. The correspondent says in part:

> The import of the socialization of the coal mines goes far beyond the immediate result it might have. The present strike will decide which course the country will take with regard to socialist doctrines and the working classes in general. If defeated in this, socialization will be, if not a thing of the past, a matter of a rather remote future. Conditions for radical measures against the coal owners are exceptionally favorable. The control of the mines has passed into the hands of a comparatively few men who have accumulated enormous wealth and influence, of which not always wise use is made. While the impoverished population is made to suffer under the increased cost of fuel, the annual report of the mines openly shows gains of a magnitude before unheard of, with still larger profits hidden behind the screen of intricate accounting. Even the bourgeois class supports the demands of the workers to convey the properties into commonwealth possession.

The position of the mine owners, on the other hand, is shown to be against socialization and they present strong arguments, which go to prove chiefly that private enterprise is indispensable to the present task in Germany. There are several proposals from economists, labor elements and groups of private owners, but the outstanding one is that of Stinnes, an industrial leader of great wealth, power and astuteness.

The process of amalgamation proposed by Stinnes has progressed with surprising speed during the past few months. On this the correspondent says:

> Its trend is to link together producers and manufacturers of all lines of goods, from the coal mine up to the finished product. The expression "vertical trust" has been coined here for such combines, intended to indicate that the combine followed the manufacturing process from the lowest stage to the highest, in contradistinction to existing trusts, which combine manufacturers of the same state. Vertical trusts not containing business rivals will not concern themselves with the control of prices. Their chief interest will be economic production whereby the various members will stimulate one another, and each member will be in a position to profit by the experiences of the others. A number of such trusts have lately been formed among the very large works. Noteworthy is the huge combine entered into between the work under Stinnes' control and the Siemens group, in itself a combine of large dimensions.
>
> Trusts of this kind are an entirely new departure and indicate that the trusts and syndicates of former times formed to control prices and to distribute production have been abandoned. This will ultimately end in the fusing together of German manufacturers into groups and in the disappearance of the individual manufacturers.

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*See special report of the Connecticut Public Utilities Commission to the Legislature, ELECTRIC RAILWAY JOURNAL, Jan. 8, 1921, page 95.

Chamber of Commerce Vote

In Answer to Referendum Sent Out by National Chamber Business Men of the Nation Declare by Practically a Unanimous Voice that the Electric Railway Ought to Be Preserved and Encouraged

THE long-looked-for announcement by the United States Chamber of Commerce in regard to the vote on Referendum No. 33 was made from Washington on Jan. 22. It will be remembered that Referendum No. 33 was sent out by the national chamber to its members on Nov. 29 and it called for a vote on eight points relating to electric railways. The voting closed on Jan. 3, when all ballots were due. The propositions submitted and the vote recorded on them follow:

1. Existing traction facilities should be conserved—for, 1,689; against, none.
2. The attitude now taken toward street railway problems should be based on the present and future needs of the community—for, 1,677; against, none.
3. The attitude which is taken toward street railway problems should contemplate private ownership and operation—for, 1,657; against, 24.
4. Regulation should everywhere be instituted that will follow promptly changes in the situation of the companies rendering services of local transportation—for, 1,666; against, 4.
5. Provision should be made against the consequences of unfair competition—for, 1,653; against, 16.
6. All burdens unrelated to the service performed should be removed from street railways—for, 1,460; against, 167.
7. Official responsibility should be definitely fixed for the application of regulation—for 1,682; against, 3.
8. Each company should seek to have available for the public at all times the facts as to the results of operation and should have resident responsible executives wholly conversant with local requirements—for, 1,683; against, 1.

The referendum on public utilities is only one of thirty-three which have been taken by the chamber on different public topics. The questions submitted were accompanied by a report of the committee on public utilities which set forth considerations leading up to the recommendations made. There also went out references to arguments in the negative so that members might have the opportunity of obtaining the fullest information with regard to the proposals on which a vote was asked.

RECOMMENDATIONS BY COMMITTEE

With reference to the first proposition that traction facilities should be conserved the committee declared that the attitude taken by the public should be constructive and not destructive, adding that, "the point of view must be that local transportation is an industry to be fostered and developed, with ample provision for correcting abuses and for preventing any one from taking unfair advantage of the public attitude."

In support of the recommendation that the present attitude should be based on present and future needs of the community, the committee called attention to the widespread belief that in the earlier history of many traction companies there had been financial mismanagement, but pointed out that, "if it be conceded that the public interest is to obtain good service at lowest cost and that street railways are essential and necessary, then the sensible way to deal with the problem is to permit existing organizations to earn a sufficient sum over their operating expenses to induce investment of capital for extensions and improvements."

Private ownership and operation were recommended by the committee with the declaration that, "a canvass of every consideration that has been brought forward in support of public ownership and operation has resulted in the committee's finding in it no solution for present problems or means of meeting future requirements."

Advocating regulation that will follow promptly changes in the situation of transportation companies, the committee asserted that elasticity was necessary because delays in the application of remedies that bear on a matter of public interest are detrimental to the public itself.

Of unfair competition the committee declared that while local transportation, as it now exists, should not be perpetuated, regardless of advances that may be achieved, a traction company should not be subjected to competition from any other source which is not under corresponding regulation and obligations.

In connection with the proposal that traction companies should be relieved of burdens unrelated to the service performed, the committee said that rates charged for street railway transportation should not be made an indirect method of taxation and that a street railway company should be taxed only on the basis of other comparable taxpayers.

Recommending that official responsibility for the application of regulation should be definitely fixed, the committee expressed the belief that a street railway company should be able to look to a single agency of the public as directly responsible for the application of regulation and that there should be no division of authority that might permit escape from responsibility.

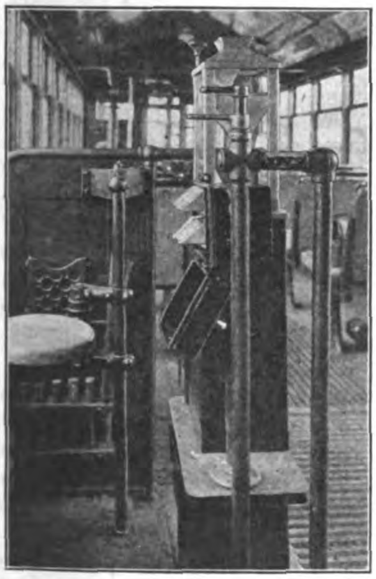
With regard to its recommendation that companies should have available to the public facts as to the results of operation and that they should have resident responsible executives conversant with local requirements, the committee said: "Adequate provision for having the public informed regarding the company and its operations and for having the company acquainted with the needs of the community will serve to prevent controversies that may have little relation to facts and to concentrate attention on the one question which is of paramount importance to the company and to the public—adequate and efficient service at the lowest rates consistent with the maintenance of such service."

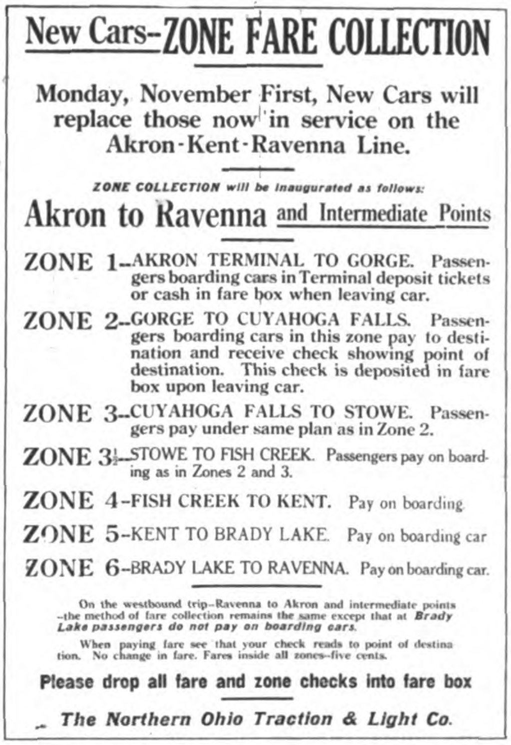
These members of the Public Utilities Committee signed the report: Lewis E. Pierson, chairman board of directors Irving National Bank, New York; Henry G. Bradlee, president Stone & Webster, Boston; Arthur W. Brady, president Union Traction Company, Anderson, Ind.; F. B. De Berard, director of research, Merchants' Association, New York; E. K. Hall, vice-president American Telephone & Telegraph Company, New York; Albert W. Harris, president Harris Trust & Savings Bank, Chicago; Charles L. Harrison, president Sinking Fund Trustees, City of Cincinnati; J. W. Lieb, vice-president New York Edison Company, New York; H. L. McCune, of the firm of McCune, Caldwell & Downing, Kansas City; P. N. Myers, president St. Paul Association of Public and Business Affairs, St. Paul, Minn.; John W. Van Allen, of the firm of Wilcox & Van Allen, Buffalo, N. Y.

Positive Interurban Fare Collection

Northern Ohio Traction & Light Company Adopts Zone Check System for Showing Each Passenger's Destination and Employs Fare Boxes and Zone Check Boxes in Combination Pay-Enter, Pay-Leave Fare-Collection Plan

DISPENSING with the common hat-check system of identifying passengers, the Northern Ohio Traction & Light Company, Akron, Ohio, has substituted a passenger pass-out check or zone check for identifying passengers. This plan has been placed in operation in conjunction with locked fare boxes and a combination pay-enter, pay-leave fare collection system on the Akron-Ravenna and Canton-Massillon divisions. The new plan appears to be very successful in overcoming loss of revenue from over-riding and in bringing all revenue collected into the treasury of the company. The first full month's operation under the new system produced an increase in revenue attributable to the method of collection of at least 14 per cent. The plan was installed on the two divisions named simultaneously with the installation of new Peter Witt type cars, equipped with multiple-unit control. Except at the free entrance loading points, later defined, only the center doors of these cars are used for entrance and exit of passengers. The reason for the employment of this type of car on these lines was primarily to keep as far as possible to a standard car, as this simplifies the equipment problem over the system. The multiple-unit equipment of these cars, however, has made it possible for the company to operate the service on the Akron-Kent-Ravenna division with four less men than were formerly required with the older type cars not having multiple-unit control.





New Cars–ZONE FARE COLLECTION

Monday, November First, New Cars will replace those now in service on the Akron-Kent-Ravenna Line.

ZONE COLLECTION will be inaugurated as follows:

Akron to Ravenna and Intermediate Points

ZONE 1–AKRON TERMINAL TO GORGE. Passengers boarding cars in Terminal deposit tickets or cash in fare box when leaving car.

ZONE 2–GORGE TO CUYAHOGA FALLS. Passengers boarding cars in this zone pay to destination and receive check showing point of destination. This check is deposited in fare box upon leaving car.

ZONE 3–CUYAHOGA FALLS TO STOWE. Passengers pay under same plan as in Zone 2.

ZONE 3½–STOWE TO FISH CREEK. Passengers pay on boarding as in Zones 2 and 3.

ZONE 4–FISH CREEK TO KENT. Pay on boarding.

ZONE 5–KENT TO BRADY LAKE. Pay on boarding car.

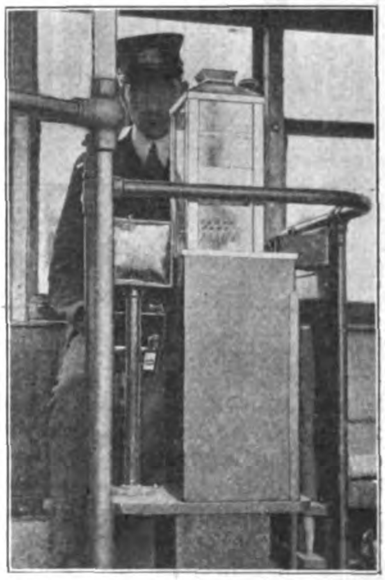
ZONE 6–BRADY LAKE TO RAVENNA. Pay on boarding car.

On the westbound trip–Ravenna to Akron and intermediate points–the method of fare collection remains the same except that at *Brady Lake passengers do not pay on boarding cars.*

When paying fare see that your check reads to point of destination. No change in fare. Fares inside all zones–five cents.

Please drop all fare and zone checks into fare box

The Northern Ohio Traction & Light Co.



LOCATION AND MOUNTING OF FARE BOX AND ZONE-CHECK ISSUING BOX—INCIDENTALLY, NOTE NEAT METHOD OF CARRYING SIGNAL FLAGS AND FUSES. IN CENTER, SAMPLE OF STATION POSTER USED TO INFORM THE PUBLIC OF THE NEW FARE COLLECTION SYSTEM

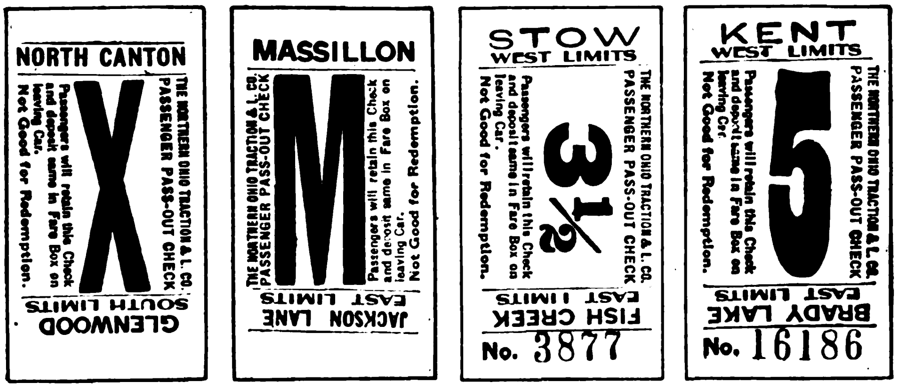
The two lines on which the positive system of collection, using zone checks, has been installed are of an **interurban character with a heavy on-and-off movement of passengers all along the route, as well as much through riding, making it difficult for conductors to keep an adequate check on the passengers. The details of the fare collection scheme follow:**

The Akron-Kent-Ravenna division is divided into six zones, the fare limits of which are the same as existed prior to the installation of the zone-check system, and the rate of fare is 5 cents for each zone as before. These zones are numbered from 1 to 6 from Akron to Ravenna and the numbers remain the same for both directions of travel. There is also an additional zone numbered 3½, intended to take care of a special condition imposed by a local franchise agreement. Zone checks, 1 in. x 2 in., of different colors for each of the seven zones are supplied to the conductor. On both sides of these checks the zone number is printed in conspicuous figures, together with the zone limits and a serial number. The checks thus have both a color and number identification to aid the conductor.

Passengers enter cars within the city limits of Akron (Zone 1) eastbound, or Brady Lake (Zone 5) westbound, without paying fares or showing tickets, and then pay upon leaving the car. These two zones are called free-entrance zones and entrance is free in them so as to facilitate the very heavy terminal loading which occurs in them. In all other zones passengers pay upon boarding the cars and receive a pass-out check which shows the zone to which they have paid and is deposited in the fare box when they leave the car.

These free-entrance zones need not be at the end of the line, but can be placed anywhere that loading conditions may dictate. For example, in summer there is very heavy travel between Akron and Brady Lake, a popular summer resort for Akron people. These two points are therefore made the eastbound and westbound free-entrance loading points, respectively. But in winter this resort business falls off. So the free-entrance zone both ways has been transferred for the winter months to Kent to favor the factory workers there. No confusion seems to have resulted from the use of the pay-leave system in these free-entrance zones with pay-enter system at all other zones.

For a passenger who boards the car in a free-entrance zone and leaves the car within the same zone the conductor deposits a zone check for that zone in the fare box when the passenger, upon alighting, deposits his nickel fare. A passenger boarding a car in Zone 2, for example, and desiring to ride to a point, say, in Zone 5, drops 20 cents in the fare box and receives a Zone 5 check from the conductor, which is dropped in the fare box as the passenger leaves the car. Likewise, when a car is operating in the other direction, a passenger boarding at Zone 5 and desiring to ride to a point in Zone 2 or 1 will drop his fare of 20 cents or 25 cents in the fare box and receive a zone check for Zone 2 or 1, respectively. Any passenger who is without a zone check upon leaving the car must be one of those who boarded in the free-entrance zone, and the fare collected from him is that covering the number of zones passed, the conductor depositing in the fare box, after the passenger has inserted his fare, the zone check for the zone in which the passenger alights. Notices are posted in the cars to the effect that any passenger not having a pass-out check will be required to pay full fare from the free-entrance zone. Passengers boarding in other zones are therefore more careful to get a check upon paying their fare and not to lose it.


NORTH CANTON
X
THE NORTHERN OHIO TRACTION & L. CO. PASSENGER PASS-OUT CHECK
Passengers will retain this Check and deposit same in Fare Box on leaving Car. Not Good for Redemption.
SOUTH LIMITS
GLENWOOD
MASSILLON
M
THE NORTHERN OHIO TRACTION & L. CO. PASSENGER PASS-OUT CHECK
Passengers will retain this Check and deposit same in Fare Box on leaving Car. Not Good for Redemption.
EAST LIMITS
JACKSON LANE
STOW
WEST LIMITS
3½
THE NORTHERN OHIO TRACTION & L. CO. PASSENGER PASS-OUT CHECK
Passengers will retain this Check and deposit same in Fare Box on leaving Car. Not Good for Redemption.
EAST LIMITS
FISH CREEK
No. 3877
KENT
WEST LIMITS
5
THE NORTHERN OHIO TRACTION & L. CO. PASSENGER PASS-OUT CHECK
Passengers will retain this Check and deposit same in Fare Box on leaving Car. Not Good for Redemption.
EAST LIMITS
BRADY LAKE
No. 16186

FULL-SIZE REPRODUCTION OF ZONE CHECKS USED ON TWO DIVISIONS OF N. O. T. & L. CO.

Any passenger boarding a car at any point and depositing 5 cents for a ride entirely within that zone receives a zone check corresponding to the zone in which he boards the car. Should a passenger attempt to override, this fact would be easily shown by the zone check deposited in the fare box as he is about to leave the car. Thus a passenger leaving in Zone 5 and depositing a Zone 4 check (or a Zone 6 check, if the car is running in the other direction) will be required to deposit an additional 5 cents and the conductor will issue a zone check for this one zone and deposit it in the fare box.

The Massillon-Canton-North Canton Division is divided into six zones, which are numbered X, T, O, C, B and M, to avoid confusion with the zone checks of the other line. These letters were selected, C for Canton and M for Massillon, and the others to avoid letters that looked alike or might be mistaken by the conductor in a hurried inspection. The zone limits on this division are also the same as the fare limits enforced before the installation of the zone system. Different colored zone checks are used for each zone. The free-entrance zones are in Massillon eastbound and at Canton Square westbound. In all other respects the same procedure is followed on the Canton-Massillon Division that has been described for the Akron-Ravenna Division.

Conductors are instructed to permit the fares deposited in the fare box to lie on the inspection plate long enough for proper inspection and to determine that the correct amount has been inserted for the distance which the passenger states he wishes to travel. When making change for passengers, the conductor returns the full amount to the passenger, who deposits the exact fare in the box. Passes, tickets, zone checks and cash are all deposited in the locked fare box.

The issuing of zone checks is greatly facilitated by a new zone-check box equipped with eight ticket slips and installed adjacent to the fare box. These zone boxes are a recent addition to the scheme. They were made by the Cleveland Fare Box Company, which also supplied the fare boxes. The zone ticket boxes are constructed of steel and fitted with a lock. A casting is fastened to the bottom for ready mounting on a pedestal beside the fare box in a convenient position for the conductor. Each conductor turns in on his report sheet the starting and ending serial numbers of each of the zone check stacks, as he is required to account for all zone checks issued each day. If a car is disabled and taken off a run the zone checks are collected and put in the fare box and hat checks issued to transfer passengers to another car.

If a passenger presents a ticket to any station on another division the conductor drops an "honored but not lifted" coupon into the fare box, pastes the stub on the back of the ticket and punches the ticket, and then when the passenger leaves the car he must show this ticket to the conductor for identification.

The zone checks are used only once, though they are turned back to the office. The additional cost of these checks over that of hat checks is very little and the total cost is not sufficient to warrant the expense of sorting for reuse.

An interesting by-product of the zone-check system is the opportunity afforded for a traffic check. Under the present system the company knows only the destination of passengers and for ordinary purposes it may be assumed that the number of passengers originating at any point is approximately equal to the number leaving the car in that zone. However, an accurate check could very readily be obtained if the zone numbers from 1 to 6 were printed on the side of the checks and then the conductor punched the zone number at which a passenger boards the car. The check issued to a passenger would then show both his destination and boarding point. This scheme could be employed constantly if it were desired to keep a continuous check on traffic, or it could be employed for a periodic check.

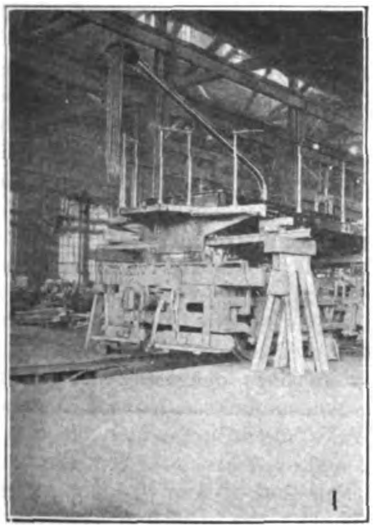
Maintenance on the B., A. & P.

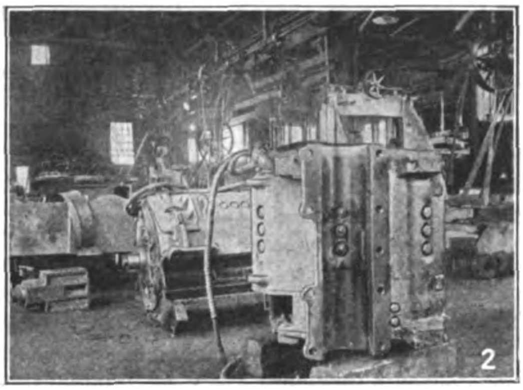
Seven Years of Operation Under Strenuous Conditions Have Demonstrated the Staying Qualities of the Electric Locomotive—Maintenance Costs with This Type of Motive Power Have Been Substantially Less Than with the Steam Engine—A Shop Force of About Thirty Men Suffices for Inspection and Repair Work

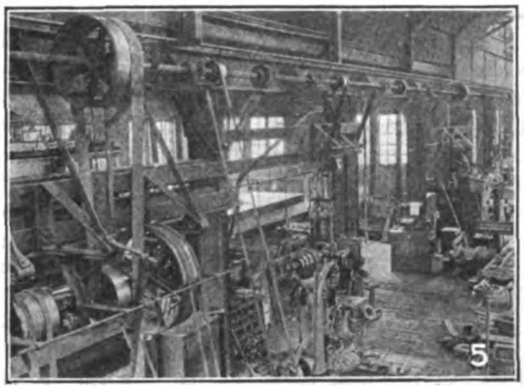
By F. W. BELLINGER
Electrical Superintendent Butte, Anaconda & Pacific Railway, Anaconda, Mont.

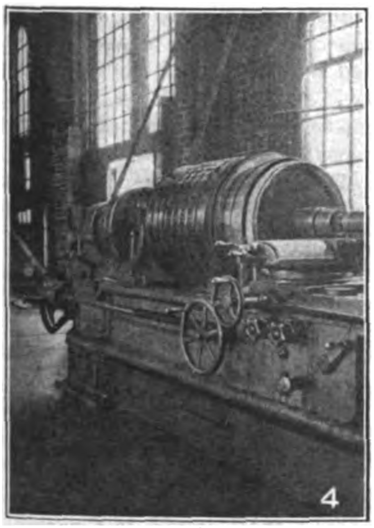
ONE of the steady-going electrically operated railroads, which now attracts little attention because outshadowed by the more extensive electrification of the Milwaukee Railway, is the Butte, Anaconda & Pacific, operated mainly between Butte and Anaconda, Mont. One of the editors of the ELECTRIC RAILWAY JOURNAL recently inspected this property and expressed his pleasure at the excellent record it was making as to reasonable expense for maintenance and in furnishing excellent passenger and freight service. He requested the writer to set down the following notes for publication in the paper. The accompanying pictures were taken to show the general layout of the shops in Anaconda, the operating headquarters, and also to give a certain "atmosphere" to this brief account of what is being done here from day to day.

At the Pasadena meeting of the National Electric Light Association, held in May, 1920, the writer furnished a paper, giving the results of experience on the B., A. & P. since its electrification in 1912 and 1913. This paper was abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for May 29, 1920, page 1101. It was repeated at the Atlantic City convention of the American Railroad Association, mechanical section, in June. Supplementing this article it is of interest to note that the railway operates a total of twenty-eight 80-ton General



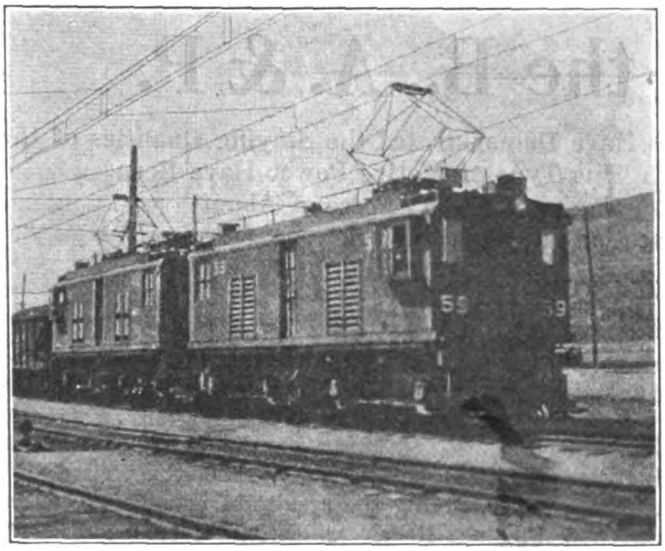




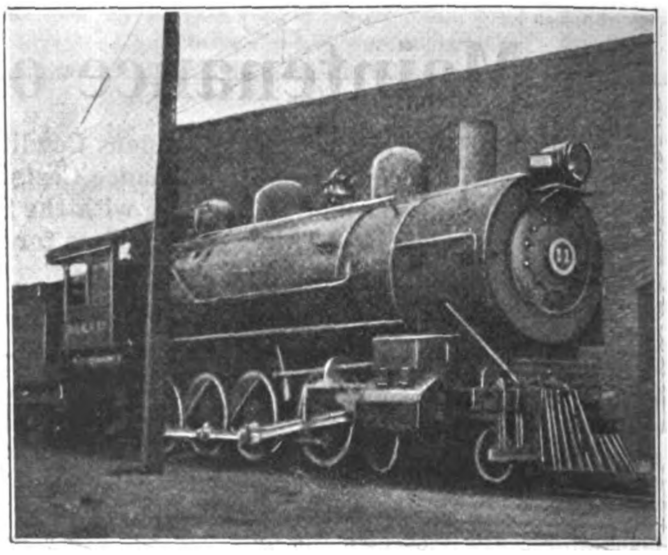


IN AND AROUND THE B., A. & P. SHOPS AT ANACONDA, MONT.

1. Tractor used to reinforce the electric locomotive.
2. Motor field frame in process of overhaul, axle bearings in foreground.
3. This partial view down the shop shows the excellent lighting, conducing to efficient maintenance.
4. Armature in the lathe, showing condition after many years of wear.
5. A glance across the shop from the crane.
6. Group of locomotives in front of the shop.
7. The "jitney bus," or line car, ready for business.



TYPE OF ELECTRIC LOCOMOTIVE WHICH IS "GOING STRONG" ON THE B., A. & P.

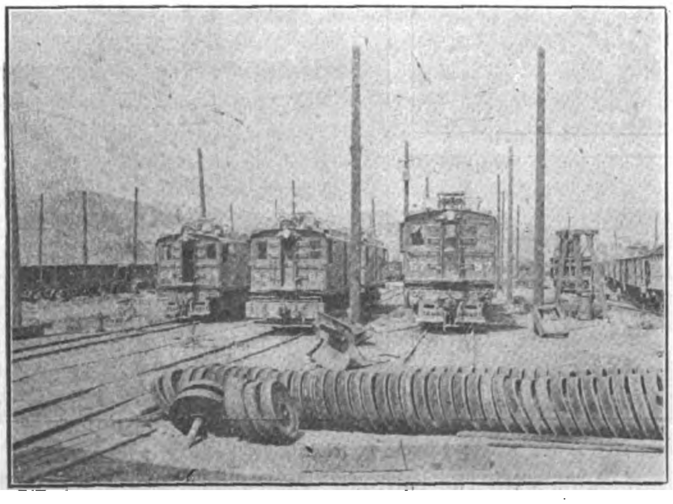


THE STEAM ENGINE IS OUTNUMBERED AT ANACONDA—ONLY FOUR LEFT

Electric locomotives and three 40-ton tractive trucks, which are used in switching service to give the equivalent of a 120-ton locomotive operating at a speed lower than that of the 80-ton units. A view of one of these tractors in the shops for overhaul is reproduced herewith. The railway also operates four steam locomotives, which are used on a division west of Anaconda and in a sandpit. The company also owns 1,176 steel hopper cars and 295 other freight and passenger cars, all of which, together with the electric and steam locomotives, are maintained in the shops at Anaconda. The change from steam to electric power occasioned no additional shop equipment, with the exception of a tension device which was purchased recently.

MAINTENANCE FORCE IS NOT LARGE

In the shops the electrical maintenance force comprises two electricians and the mechanical force includes five machinists, two machinist's apprentices, four helpers, two drillpress men, one wiper, one oiler, one boilermaker and his helper, three blacksmiths and three helpers (working principally upon steel cars), a pipefitter and helper, a carpenter and two painters. The electrical men are employed for other work in addition to maintaining the electrical equipment of the locomotives. These additional duties consist of caring for the car-heating and lighting equipment, the power, heating and lighting of the locomotive and car shops and similar work.



HERE THE CAMERA CAUGHT A BUNCH OF LOCOMOTIVES IN THE YARD

During the seven years which these electric locomotives have been in operation the average cost of repairs as compiled for the Interstate Commerce Commission's records averages approximately 6 cents per locomotive-mile. This compares with 16 cents per locomotive-mile for steam locomotives in the same service during the year 1909. The cost of labor and materials is considerably greater at present than in 1909, so that the ratio of 6 to 16 cents is ultra-conservative.

Passenger locomotives are inspected electrically and mechanically every thirty days and freight locomotives every forty days. The maximum time between inspections was seventy-five days in one instance and frequently the periods mentioned above are exceeded by a week or ten days. Locomotives operating at Rocker, twenty-two miles from Anaconda, receive no attention other than oiling and brakeshoe adjustment.

Inspections are made out of doors, over a cinder pit, summer and winter. This out-of-door inspection, especially during winter months, has been found necessary due to sweating which follows the placing of locomotives in and out of heated shops. It has been proved that this procedure has eliminated no small number of armature failures.

A light overhauling of trucks is given when tire wear makes turning or renewal necessary, or after about 25,000 miles running. Flange wear is very heavy due to the curvature of tracks at the mines in Butte and at the smelter at Anaconda. A total of 3,267 deg. of curvature exists between these points, which is equivalent to turning a train approximately nine times.

Overhauling comprises the following: Turning tires, babbitting bearings, when necessary, lining shoes and removing lateral.

The B., A. & P. has had a number of notable life records of parts of its equipment. For example, take the contactor tips. Of these but 21 per cent have had to be renewed after seven years of service. Again, the Grade F pinions have averaged a life of 100,000 miles, while motor brushes have averaged 12,000 miles. So far it has not been necessary to turn any of the main-motor commutators, the wear being only appreciable. The average life of pantograph rollers has been one year.

The rollers are made from Shelby steel tubing 5 in. in diameter and 24 in. long. These are mounted on Hyatt roller bearings, No. 16,410, which in turn are housed in aluminum castings secured in either end of the tubing.

Table I shows the over-all operating and maintenance costs of these electric locomotives during 1919. Recently they operated for twenty-three months without an armature failure of any kind.

TABLE I—OPERATING COST DATA FOR B., A. & P. ELECTRIC LOCOMOTIVES

	Cents per Mile
Maintenance of equipment expense, including repairs, supervision, shop machinery tools	14.15
Locomotive engineers and firemen	11.55
Engine house service	2.60
Cost of electric power	15.26
Lubrication	0.81
Other supplies	0.58
Total	44.95
Maintenance of equipment expenses (repairs) less supervision, shop machinery tools	6.48

Another item of interest is that the air-compressor motors have operated continuously since 1913 without an armature failure. In fact there was but one failure of any kind, and this was due to the breaking of a wire between field coils.

Some idea of the work done by these locomotives can be obtained from the fact that two of them haul sixty-five loaded ore cars, averaging 71 tons per car, up a ruling grade of 0.3 per cent at an average speed of 15 m.p.h.

Containers the Ultimate Answer

By Their Use in Freight Transportation the Use-Efficiency of the Freight Car and the Motor Truck Will Be Multiplied and Each Will Do the Work for Which It Is Best Adapted

ON JAN. 25 Col. J. C. Bonner presented an address before the Traffic Club, New York, on his "container" system for freight transportation. An abstract follows:

To be universally serviceable and practical containers must have these prerequisites: They must be commodious and mounted fixedly on four wheels, wagon type, for purpose of independent movability in any situation. To be conveniently available as well as sufficiently serviceable, they should be as numerous as flivvers and so alike in appearance and dimension standards as to require reference to numeral insignias for identification, hence from exteriors the sealed contents would be unknown. They should house sufficient light bulk freight to qualify a revenue tonnage load and need, therefore, be graduated to carry either 5 or 8 tons. They should be as light as possible consistent with strength.

In operation they should be loaded and sealed at the warehouse by the shipper's clerks and in due course be delivered directly to the consignee's warehouse whether the route covered is over streets, on water or over rails. They should ever be in readiness to be pulled either by a team or tractor, or to trail or be carried astride auto chassis trucks, chassis steam railroad cars or trolley chassis cars; to be lifted intact to elevation walls of construction work, put in cold storage or down in a vessel hold. Figuratively, a "through container wagon" should be a sealed heavy contained luggage trunk, but a wheeled perambulator all the while.

Any vehicle exclusively patterned for the rail or for highway transportation is not fully scientific for freight handling, since neither can travel both rail and highway as is generally needed, nor is a vehicle body alone, since it requires crane service at transfers. A "through container" wagon must qualify to undertake a 5-mile or even greater distance haul over a highway that rates but one-twenty-fifth of any comparative means of mobility and then must proceed by rail the longer distance to get such advantage.

Consider now that any number of container wagons can be moved to a position astride lengthwise of a railroad siding and be aligned by following a guide rail. Provided, now, that the wagons have no cross axles, and they are not needed, a locomotive can then back under them a sufficient number of fitting chassis freight cars, capable each of holding three wagon units. Then by the manipulation of train air control the wagons rise so that the wheels clear the rails and the loading is completed and the train ready to move. The unloading of the containers is as instantly done by simple air release of the carried wagon, so that the fixedly mounted wheels again tread the ground.

Some time since, Henry L. Doherty, who has recorded the greatest individual success as an operator, invited a number of executives of railway systems, railway equipment and automobile corporations to a conference at his office. He told them that the interests then present and others of like relation should together expend, if required, a million dollars to develop and demonstrate by operation some means to move freight without the load being rehandled during transit and to attract a greater percentage of freight to the rail, since $40 worth of electrical energy on rails will equal the tractive work of $240 worth of gasoline on a highway, and because a ton is moved over rails at one-twenty-fifth the tractive resistance that moves a ton over a highway. Committees of engineers and of executives studied assiduously the matter for a year. All the reports approved it and an organization is now functioning. Systems represented among the signatory member corporations of the group that is now developing the "through container" vehicle system operate upward of 4,000 miles of railways and show assets in excess of two billions of dollars. The group units of the rail wagon system* consist of the "through container" or rail wagon, a chassis steam railway carrier car, an electric railway chassis car, an auto truck chassis, a railway alignment switch and freight movement terminal building and tracks.

Under the "through container" system, with freight cars continuously mobile, and with auto truck chassis, tractors or teams of horses ready instantly to move the rail wagons from the rail, cars and trucks will not have to wait during the rehandling process and much of the present yard space and tracks can be used otherwise than as terminals. A standard freight car, wastefully idle now twenty-two hours out of twenty-four, will be multiplied in efficiency many times. The 40,000 miles of trolley tracks and the 600-odd short line steam roads will salvage their capital accounts and serve as the very best new feeders and distributors to steam trunk lines and to electric roads as well. The truck will have a correspondingly enlarged field of usefulness and income revenue and can be in mobile action during the twenty-four hours of a day, if necessary. With the ton-mileage of the rail multiplied and the highway ton-mile lessened the life of streets and roads will be prolonged. The trouble with the railroads in the past has been that in addition to furnishing transportation (which is their business) they have furnished warehousing (which is not their business), and such warehousing has grown so big that it chokes their terminals, ties up their cars and cripples their systems. A standard freight car is at its full value only when it is on the move. As handicapped and conditioned in the year 1919 it earned a gross average of only $2.25 per day.

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*See also ELECTRIC RAILWAY JOURNAL for Oct. 12, 1918, page 658.

With scientific use of the new auxiliary "through container" neither the standard rail vehicles, steam or electric, or the standard highway vehicle, animal or motor, will be crowded from rightful prerogative. Each will still get all the business it goes after and can execute with profit.

Edward Hungerford, a popular writer on utility topics, also addressed the club. He stated that the salvation of the railroads is dependent on the farsightedness or vision of those now in control as to how the railroads will function in the future. He referred especially to freight terminal facilities, and to the Cincinnati plan, under which, by the use of fifteen special motor-truck chassis and 200 wooden containers, costing only $400 each, the speed with which freight was transferred from one terminal to another was so increased that some 66,000 freight cars were returned to interline service, and in addition a further saving of from $1,000 to $1,500 per day was made in freight-handling costs.

Mr. Hungerford expressed the belief that the use of such containers will grow and that many shippers in the near future will be using them in handling a large part of their shipments. It is impossible for the railroads to finance this new equipment, and unbelievable to think the government will do it, but there seems to be no reason why the necessary cars and containers cannot be built under a car trust and rented, the cars and motor chassis on a mileage basis and the containers on a per diem basis.

Advantages of Containers in Freight Traffic

AT THE New York Highway Transportation show held recently, F. W. Wenn, secretary motor truck committee of the National Automobile Chamber of Commerce, presented a paper on the use of the motor truck in relieving terminal congestion. In speaking of terminal losses due to congestion as it recently existed at the main distribution centers of the steam road terminals, he stated that if the junction and terminal delays could be eliminated the daily average freight car mileage could be brought up to 37.5 miles per car per day, equivalent to an addition of 1,200,000 cars.

The use of the motor truck with portable container bodies at these vital points—as in Cincinnati—would greatly increase the capacity of revenue produced at these terminals. In this system the freight, when unloaded from the railroad cars, is trucked to the container body, which has previously been carded for the proper distribution point. When loaded, these bodies are sealed, put under telephone order of a joint dispatcher employed by the railroads, and loaded mechanically onto trucks and then routed over the streets to destination. On arrival the container or body is mechanically unloaded and another loaded body put on the truck chassis for return delivery or to another point. This means of handling terminal freight in Cincinnati has reduced the cost of handling 35.2 cents per ton and has eliminated 300,000 switching movements annually. It has also proved that all widely distributed station facilities can be laced up as a unit without investment cost to the railroads, thereby giving to each the benefits of a union freight station. The speaker estimated that with such a system in effect in New York City, where 50,000 tons of freight are moved daily between the various terminals, a saving of $45,000,000 would be made annually.

Toronto Making Huge Investigation

IT IS probable that a large number of American electric railway companies have recently received blank questionnaire forms from the Toronto Transportation Commission. It appears that this commission is making an immense investigation which will enable it to study, as it says, "the changed conditions, as regards expense, value and revenues, which have taken place within the last six years." Companies are requested to furnish complete information for the year 1914, 1916, 1918 and 1920.

The form calls for almost every item of information which any one might wish to know about a railway. The following are some of the subjects upon which information is requested: Name of city, population, population served, route-miles both inside and outside of city, total miles of main track, passenger cars with details, car-miles, power consumption per car-mile, car seat-miles, passengers carried, revenue and transfer, passenger car-hours, passenger earnings, total earnings, operating expenses divided into transportation in detail, maintenance in detail, depreciation and renewals in detail, and upon each of the latter items the total amount and condition per cent at which property is maintained and rate and life allowed are asked; other subjects upon which information is desired are taxes and the investment and present cost of new track and substructure, overhead conduits, cars, carhouses, power equipment, powerhouse buildings, miscellaneous, and estimates of present cost are asked of 1 mile of double track, paved, on heavy traffic streets, exclusive of special work, and also upon 1 mile of overhead.

If replies to this questionnaire are received in any large number, the result will constitute material upon which can be based one of the most comprehensive reports and analyses, from a statistical standpoint, to which the electric railway industry has been subjected.

The A. S. M. E. Boiler Code

THE boiler code committee of the American Society of Mechanical Engineers and the National Board of Boiler Inspectors will meet in Detroit, Mich., Feb. 2 to 4, for the purpose of planning for a national system of boiler inspection and for an enlargement of the influences set in motion by the A. S. M. E. boiler code. The first edition of this code was printed in 1914. Four years later a revised edition was issued, incorporating interpretations of the rules formulated in response to questions asked during the interim.

As a standard for new construction, the code has been adopted with varying degrees of completeness by the boiler inspection departments of twenty-one states. The standard of Massachusetts, which has its own code, does not differ essentially from the A. S. M. E. code. The remaining states have no boiler inspection departments. Numerous cities provide by ordinance for boiler inspection and eleven cities have adopted the code.

Selling Trainmen Their Jobs

Pennsylvania Company Conducts a Campaign Among Its Workers and Attempts to Improve Working Conditions by Publishing Stories in the Press on Accidents and Accident Prevention

THE Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway, operating through the Beaver Valley, Pennsylvania, a short time ago conducted an earnest campaign among their employees to create a better pull-together spirit in the enforcement of the service code for employees issued by W. H. Boyce, general manager of both companies. Extracts from this code were published in the ELECTRIC RAILWAY JOURNAL, Sept. 6, 1919, page 503.

Codes are usually dull reading. This code, however, is the exception and a few paragraphs are reprinted herewith to prove it:

> The greatest *service* existing in your work is the *service* the passenger gives you. Funny, isn't it? True though. I said he paid your wages. That's mighty important to you—mine are to me, anyway. So, every *service* you can give the passenger will not be any more than he is entitled to—remember that.
>
> But few of the passengers consider you except in the way you serve them in their transportation needs. Do your duty by every one and when the day comes to a close you can in content spend the evening with the folks at home. Violate the rules and circulate your grouch and things won't be pleasant here nor at home.
>
> Let me tell you that the passengers are more valuable to us than you are. We cannot get along without the passengers. So, put in the background or shelve any idea you may have or had that you are the king pin. You are not—neither am I—the passenger is the important party. Don't forget it.
>
> You represent this company on the cars. From the stockholders down to the smallest official this company is clean, frank and has nothing to conceal. Representing the company, you will understand that cleanliness in person, appearance, language and mind is essential. While the company may be in financial straits, yet you receive your wages regularly. Nothing should prevent you from having well appearing uniforms. Pressing and cleaning will help in appearance. Soap and water is the best eliminator for dirt and germs on hands and face.

LETTERS AND BULLETINS SENT EMPLOYEES

To keep up the interest among the employees in good service and safety methods, letters accompanied by bulletins were sent by H. O. Allison, safety engineer, to the men at their homes asking for their co-operation in safety-first work and a pull-together spirit with company officials in their daily duties. The letters were personal and to the point, nevertheless they contained cautions regarding careless car operation on slippery rails, violation of the rules as to door operation with car in motion, proper starting and stopping of cars as a means of accident prevention, etc.

Several of these letters are reproduced, as well as the accompanying bulletins, and attention is called to the letter that defines "safety first." These definitions would bear repetition by others that are conducting safety first campaigns. The bulletins issued to the employees dealt with the same topics and pointed out that the interests of the men were identical with those of the company. Co-operation, they said can and will make success for both and nothing else will.

One bulletin outlined what the company wanted to do for the welfare of its employees if only given a chance.

Letter Number Four

Oct. 20, 1919.

MR. J. RUPPLE,
1015 Third Avenue,
New Brighton, Pa.

MY DEAR RUPPLE: We have heard a great deal lately of "safety first." How many have ever stopped to inquire what it means as applied to street railway employees?

Let us consider just what "safety first" means as applied to ourselves. This is an intensely personal matter and has to do with our every act, especially while in the discharge of our duties.

It means having a clean body and clear mind. No one who has in his care the life, limb and property of others can properly perform his duty unless he is mentally and physically sound. The car man's duties require a clear head, good eye and steady hand.

It means so to perform our duties that our own conscience will acquit us of all blame, should an accident occur. That we should know in our innermost selves that nothing we could have done would possibly have prevented the injury.

It means to depend upon no one else. To do, ourselves, all that lies in human power to prevent injury to the person or property of any one, be he ever so lowly.

It means looking out for the other fellow, looking out all the time, expecting him to do some careless thing.

It means ringing the gong and slowing the car on approaching street crossings and intersections.

It means looking out for children playing in the street; for feeble persons boarding your car; let them get seated before car is started.

It means starting your car carefully and feeding current correctly.

It means knowing that your passengers are safely on or off your car before "go-ahead" signal is given.

It means that the rules should be closely studied and carefully observed.

It means, last, that "safety first" must be first in your mind. That it must be continually in your thoughts and govern your every action where your fellow man is concerned.

IN ALL CASES OF DOUBT TAKE THE SAFE SIDE.

IT IS BETTER TO BE SAFE THAN SORRY.

Yours very truly,
Safety Engineer.

Approved:

____
Superintendent.

Letter Number Five

Oct. 20, 1919.

MR. F. E. THOMPSON,
R. F. D. No. 3,
Eastvale, Pa.

MY DEAR THOMPSON: In whatever line of work a man engages he should aim to become a master; not only do his services become more desirable as his efficiency increases, but the mere striving after a high standard of attainment makes the work itself interesting and attractive.

One of the aims of the railway employee who would become a master motorman should be to operate his car smoothly, carefully and safely at all times.

The motorman who runs his car smoothly does more than make travel pleasant as such operation represents safety.

To start a car by feeding current point by point, to bring it to a stop smoothly, mean not only smooth but safe running. On the other hand to attempt to give the car excessive speed at the start by feeding current three or four points at once, to bring it to a sudden stop by jamming brakes mean in many cases not only uncomfortable but unsafe travel.

When a car is started suddenly there is a probability of passengers being thrown to the floor of the car before reaching a seat or even after they are seated. Also by making the stop suddenly passengers on their way to the platform to alight are apt to be thrown.

Whenever a motorman runs on the principle that he will make his stop short not only is there danger of throwing passengers to the floor, but there is added risk that the motorman may miscalculate the distance in which he can bring his car to a stop and a collision with a vehicle or pedestrian is liable to occur.

Whenever a car is started or stopped with a jerk discomfort of passengers always and frequently accidents result. Do not then attempt to start your car at too high a speed, or endeavor to stop suddenly, except, of course, in case of emergency.

When following a vehicle do not crowd it too closely, but sound gong and keep car under control until you know you have attracted the driver's or chauffeur's attention. He may not know that you are behind him and stop quickly or turn suddenly in front of you.

When following another car remember and keep 300 feet behind it as prescribed by rule. Always run your car smoothly when starting, when moving, and when coming to a stop.

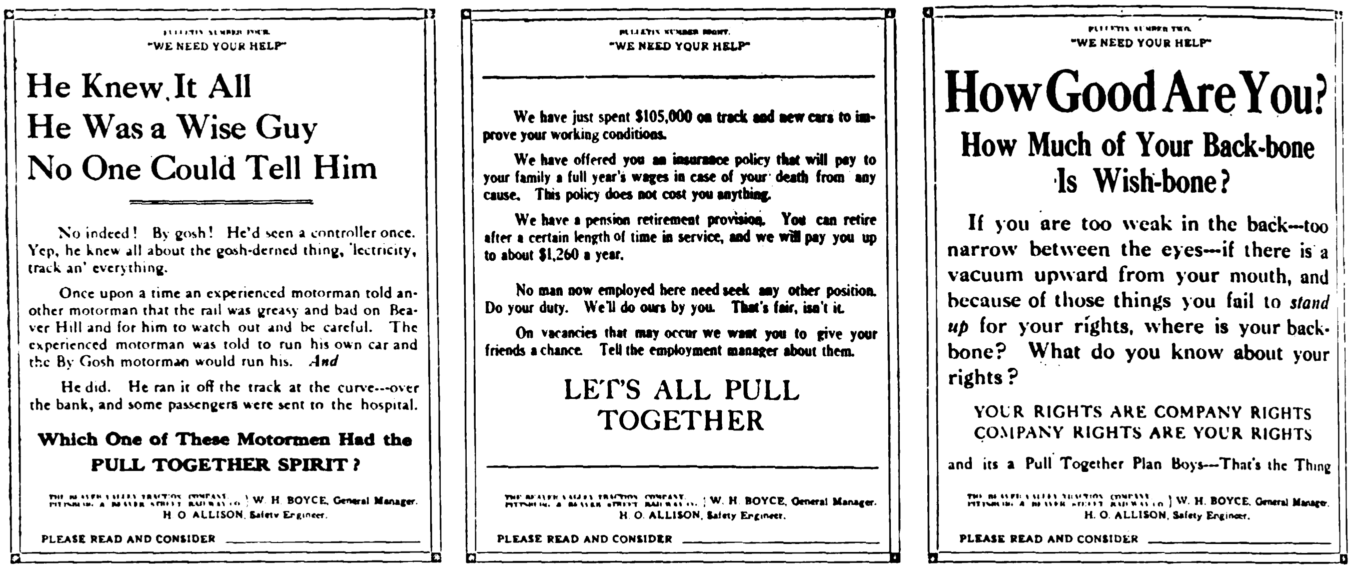
If you make your aim at smooth running true enough you will also hit the target of safe running.

Yours very truly,
Safety Engineer.

Approved:

____
Superintendent.

TYPES OF PERSONAL LETTERS ADDRESSED TO TRAINMEN AT THEIR HOMES



BULLETIN NUMBER FOUR
"WE NEED YOUR HELP"

He Knew It All
He Was a Wise Guy
No One Could Tell Him

No indeed! By gosh! He'd seen a controller once. Yep, he knew all about the gosh-derned thing, 'lectricity, track an' everything.

Once upon a time an experienced motorman told another motorman that the rail was greasy and bad on Beaver Hill and for him to watch out and be careful. The experienced motorman was told to run his own car and the By Gosh motorman would run his. *And*

He did. He ran it off the track at the curve---over the bank, and some passengers were sent to the hospital.

Which One of These Motormen Had the PULL TOGETHER SPIRIT?

THE BEAVER VALLEY TRACTION COMPANY
PITTSBURGH & BEAVER STREET RAILWAY CO. } W. H. BOYCE, General Manager.
H. O. ALLISON, Safety Engineer.

PLEASE READ AND CONSIDER ________

BULLETIN NUMBER EIGHT
"WE NEED YOUR HELP"

We have just spent $105,000 on track and new cars to improve your working conditions.

We have offered you an insurance policy that will pay to your family a full year's wages in case of your death from any cause. This policy does not cost you anything.

We have a pension retirement provision. You can retire after a certain length of time in service, and we will pay you up to about $1,260 a year.

No man now employed here need seek any other position. Do your duty. We'll do ours by you. That's fair, isn't it.

On vacancies that may occur we want you to give your friends a chance. Tell the employment manager about them.

LET'S ALL PULL TOGETHER

THE BEAVER VALLEY TRACTION COMPANY
PITTSBURGH & BEAVER STREET RAILWAY CO. } W. H. BOYCE, General Manager.
H. O. ALLISON, Safety Engineer.

PLEASE READ AND CONSIDER ________

BULLETIN NUMBER TWO
"WE NEED YOUR HELP"

How Good Are You?
How Much of Your Back-bone Is Wish-bone?

If you are too weak in the back---too narrow between the eyes---if there is a vacuum upward from your mouth, and because of those things you fail to *stand up* for your rights, where is your backbone? What do you know about your rights?

YOUR RIGHTS ARE COMPANY RIGHTS
COMPANY RIGHTS ARE YOUR RIGHTS

and its a Pull Together Plan Boys---That's the Thing

THE BEAVER VALLEY TRACTION COMPANY
PITTSBURGH & BEAVER STREET RAILWAY CO. } W. H. BOYCE, General Manager.
H. O. ALLISON, Safety Engineer.

PLEASE READ AND CONSIDER ________

TYPES OF BULLETINS ENCLOSED WITH PERSONAL LETTERS

The pension scheme, which allows a maximum of $1,260 per year, was likewise given, all with the idea of pointing out that no man now employed need seek other employment. The bulletin further urged present employees to get their friends lined up with the employment manager for any vacancies that may occur in the present ranks.

The bulletins also brought out that the men on the cars represented the company in the eyes of the public and urged them to tidiness in their uniforms, saying: "It is not a slouchy company that you work for—dress right—and introduce your uniform to a flatiron once in a while." "Knockers," a bulletin says, "lose out, for they are not the kind of fellows wanted." "Satisfied workers are wanted"; those not satisfied are urged to move on unless they can go to the company officials and quietly tell the reasons. If that dissatisfaction cannot be wiped out the company is willing to advise as to the best next move.

NEWSPAPER CAMPAIGN ON ACCIDENT PREVENTION

As auxiliary to this campaign the company proceeded to improve the working conditions by conducting a safety campaign through the public press.

In November last Mr. Allison began a series of articles in each issue of the Beaver *Daily Times*. A story not too long to fail of being carefully read appeared daily under the caption, "Accidents and Accident Prevention." The series started out by reviewing the number of accidents fatal and otherwise in the United States and the State of Pennsylvania, then gets home to Beaver County, which had thirty-one fatalities during 1919, as well as 480 serious and 1,808 minor accidents reported to the Pennsylvania State Department. This record rates one person out of every forty-three in Beaver County as being injured during the year.

The series then takes up accident prevention, jay walking and safety work with school children and brings out that the cause of most children's accidents is carelessness and fear. Mr. Allison urges that the children be taught caution and safety—not fear—to walk rapidly, but not to run across streets, not to jay walk, but to follow the crosswalks, etc.

The series of articles also makes mention of the National Safety Council and outlines its scope and work. All forms of accidents, industrial, pedestrian, etc., are spoken of, as well as the traffic rules recently suggested by the United States Bureau of Standards, without making it too pointed that the railway company is really urging pedestrians and auto drivers to use caution and conserve human life.

Electrification of Staten Island Lines Proposed

Present Rapid Transit Facilities of Staten Island Analyzed and a Comprehensive Plan of Electrification Suggested —Tunnels to Brooklyn Will Soon Be Necessary, Connecting with Existing Rapid Transit Lines

AT A MEETING of the Brooklyn Engineers' Club held on Jan. 13, 1921, R. H. Mitchell read a report compiled by Randolph H. Nexsen, electrical engineer of the New York State Public Service Commission, on Staten Island transportation conditions and the proposed electrification of the rapid transit system. An abstract of this report follows:

The dual subway contracts now approaching completion provide certain rapid transit facilities for four of the five city boroughs according to the plans laid down in 1913. Until recently little or no future planning had been done, but with the development of a comprehensive rapid transit plan it is quite apparent that within a few years Richmond, the fifth borough of the city, will be provided with such facilities, probably by means of a tunnel under the Narrows connecting with the existing Fourth Avenue subway. Such a connection will bring both Brooklyn and Staten Island into closer connection with Manhattan.

Staten Island has an area of about 58 sq. miles and is third of the five city boroughs in size. Its greatest length is about 13 miles and its greatest width about 8 miles. In 1900 Staten Island had a population of 67,021; in 1910, 85,969; in 1915, 98,634, and in 1920, 116,531, or an average density of about 3.2 per acre. The average density of the city of New York is about thirty per acre. The greater part of the population lives on the north and east sections of the island. The south section is moderately settled, while the interior and west sections are sparsely populated.

Exterior means of communication consist of ferries with one exception, the Baltimore & Ohio Railroad

TABLE I—STATEN ISLAND'S FERRY FACILITIES

Line	Route	Distance Miles	Passengers Carried 1918	Passengers Carried 1919	Remarks
Municipal	St. George to Battery	5	17,561,801	19,579,271	Rush hour service, fifteen minutes. Other periods, twenty-thirty minutes
Brooklyn	St. George to Sixty-ninth Street, Bay Ridge, Brooklyn	1.69	495,972*	970,384*	Not operated during winter
Tottenville	Tottenville to Perth Amboy, N. J.	0.5	1,206,251	1,314,395	
Linoleumville	Linoleumville to Cartaret, N. J.	0.19			Summer months only
Holland Hook	Holland Hook to Elizabethport, N. J.	0.16	625,554	628,898	
Port Richmond	Port Richmond to Bergen Point, N. J	0.26	1,072,312	1,136,262	

*Nine months

bridge at Perth Amboy, at present used for freight service only.

There are three electric street railway systems operated on the island: Those of the Richmond Light & Railroad Company, 17.29 route miles; the Staten Island Midland Railway, 16.18 route miles, and the Southfield Beach Railroad, 1.57 route miles. The street railways parallel the rapid transit lines for most of their length and also serve a considerable portion of the interior of the island. The rapid transit passenger service is furnished over 23.5 route miles of double-track steam railroad which is also used for freight service; the lines of the Staten Island Rapid Transit Company, 20.81 route miles, and the lines of the Staten Island Railway, 12.65 route miles.

A conservative estimate indicates that 75 per cent of the working population of Staten Island is engaged in business in Manhattan or Brooklyn, most of which is carried on the Municipal Ferry.

The Staten Island Rapid Transit lines carried 4,600,273 passengers in 1914 and 9,269,902 in 1918, an increase of more than 100 per cent in four years. Under present conditions service seems to be adequate, but during the rush hours an increase is desirable. At present the companies have not a sufficient equipment materially to increase this service and there is also the difficulty resulting from the derangement of passenger schedule due to freight movement.

If serious consideration is to be given to a comprehensive self-contained rapid transit system for Staten Island under existing conditions, the following steps are necessary:

1. An interborough connection, by tunnel or other means, with Brooklyn or Manhattan, preferably Brooklyn, to connect with existing rapid transit city lines.
2. The electrification of the existing rapid transit lines on Staten Island.
3. Additional tracks to be provided on the North and East Shore Divisions of the existing lines.
4. The elimination of grade crossings when additional tracks are provided on the North and East Shore Divisions.
5. The construction of a new terminal at St. George.
6. The construction of a line between Tottenville and Arlington on the west shore and the development of belt-line operation.
7. The extension of trolley or bus lines into the center of the island to act as feeders to the completed belt line system.
8. The construction of a mid-island rapid transit line in a general southwesterly direction from Tompkinsville.

Assuming that the Narrows tunnel as planned and approved by the Public Service Commission in 1912 was constructed and the Staten Island rapid transit lines electrified, a connection would then be provided to Bay Ridge, Brooklyn, and the Fourth Avenue subway. Such a connection would immediately give those within reach of Staten Island lines access to the business sections of Manhattan and Brooklyn. The express schedule from St. George would be about thirty minutes to the Municipal Building.

In making any comparison it must be kept in mind that the headway would be shorter, the fare would not be so high as the combined railroad and ferry fares, there would be no delays due to water-borne traffic such as are now encountered by the ferries, the running time would compare favorably with that for similar distances on existing rapid transit lines and there would not be the long transfer from the Staten Island rapid transit lines to the ferry. The fare from most stations on the Staten Island rapid transit lines would have to be about 10 cents.

In the construction of any tunnel to connect with the Fourth Avenue subway, the growth of Bay Ridge and other sections must be borne in mind, as this subway is fast approaching its limit of capacity. The introduction of the Staten Island traffic may overload it and postpone this connection until a new subway connecting Brooklyn and Manhattan could be built.

It has been assumed that a maximum of eighty-five or ninety cars operated in multiple-unit trains will be necessary after electrification, as there will probably be an increase in traffic. To handle this increase the car equipment proposed is similar to that of the New York Consolidated Railroad, which has a seating capacity of ninety. This type of equipment has been selected because, at some future time, a physical connection will probably be had by the New York Consolidated Railroad with the roads of Staten Island, and an operating agreement would be to the mutual benefit of both companies, as well as to the traveling public and the city of New York. In general, the physical characteristics of electrical equipment are such that joint operation and the interchange of equipment and power would be possible. Based upon the above condition, the use of 650-volt direct current has been considered. This current is to be taken from a covered third rail supplied from synchronous converter substations, which are tied in with a three-phase 11,000-volt, alternating-current transmission system.

Mr. Nexsen has prepared three estimates, one of $13,338,662, covering the complete electrification of the existing Staten Island rapid transit lines; another, including the necessary items of electrification, except that power is purchased, of $8,380,247, and the other, the proposed construction and electrification of the West Shore connection between Arlington and Tottenville, of $3,947,636. It is his opinion, also, that very much improved service for the same operating expense will result from electrical rather than steam operation and such betterment of service would almost surely result in a rapid acceleration in population growth on Staten Island. This growth would, in turn, make possible increased revenue for the company and better service for the traveling public, to say nothing of the increase in property values.

Opinions Regarding Endorsement by the Association of Reports of Federal Electric Railways Commission and of Chamber of Commerce Committee

Railway Executives and Public Service Commission Members Discuss the Pros and Cons of Action by the Association — A Practical Demonstration of Co-operation, Says One—Action Will Be Disclosure of Average Local Conditions, Says Another

THE *question of endorsing, or taking some action with reference to, the reports of the Federal Electric Railways Commission and of the special committee of the Chamber of Commerce United States will be considered at the mid-year conference at Chicago, following President Gadsden's recommendation.*

That this is an important move is generally admitted. Believing that comments from several viewpoints would assist in crystallizing opinion on this subject the editors of the ELECTRIC RAILWAY JOURNAL *have sought opinion from the field.*

General Guy E. Tripp, chairman of the Board of Directors of the Westinghouse Electric & Manufacturing Company and chairman of the Committee of One Hundred, was asked to give his views. He said:

"The suggestion that the American Electric Railway Association should place itself on record regarding the report of the Federal Electric Railways Commission and the report of the special committee of the Chamber of Commerce of the United States makes the coming Chicago Mid-Winter Conference probably as important a meeting as the association has ever held.

"The suggestion, of course, contemplates an endorsement of the reports in question because the association would hardly go on record as condemning them. The question really is then whether it is wise for the association to approve the principles laid down in these reports in a clear-cut and complete manner.

"There is no doubt that a very interesting discussion will result.

"There are undoubtedly electric railway companies whose troubles cannot be settled upon the principles laid down in these reports without serious results to their outstanding security obligations; for example, a settlement upon these principles might result in some companies being taken over by their bondholders and the capital stock rendered worthless. In these cases the stockholders are naturally endeavoring to find a basis of settlement which shall be fair to the public and which at the same time will not entirely wipe out their stockholdings.

"Such companies may think the proposed action by the association to be harmful to their plans.

"On the other hand, there are companies whose affairs, if adjusted upon the 'cost-of-service' and 'fair-valuation' principles, will be placed upon a sound and healthy basis. Such companies will naturally see a benefit to them in an endorsement of these principles by the association. However, even the latter may wish to have 'cost of service' more accurately defined and to bring forward some items not popularly envisaged which ought to be included in a 'fair valuation.'

"Each member of the association will doubtless feel that his own situation is controlled to a large extent by local conditions and that local conditions should have large weight in the application of general principles to the solution of his problem. Therefore, if action is taken upon these reports, it will be an illuminating disclosure of the average of local conditions in the electric railway field."

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A. W. THOMPSON, *president of the Philadelphia Company, owners and operators of the Pittsburgh Railways, is another whose comment on this proposed action was requested. Writing under date of Jan. 24, 1921, Mr. Thompson presents his views as follows:*

"While perhaps not unreservedly in agreement with all the opinions and conclusions expressed in the Federal Electric Railways Commission report, I consider it a most important and constructive document upon which electric railway managements may base hopeful efforts to conduct their properties on a sound business foundation.

"In any such comprehensive report, however, there are of necessity some conclusions reached and some opinions expressed which will not harmonize with conditions everywhere, and consequently I doubt the wisdom of an unqualified endorsement of this report.

"The report shows the high ability and intelligence of the street railway and financial representatives on the board and the resultant recommendations more nearly meet the requirements of the situation than was hoped for. If the American Electric Railway Association endorses the report without qualification, however, it will practically become law for the industry. This would establish it in a position which it would seem it was not intended to fill.

"There are a number of principles firmly established on sound economics which are splendidly expressed and should be endorsed by all utility companies. To quote one: 'The first essential is service to the public.'

"In so far as the report follows this principle in accordance with sound business experience it should be endorsed, but it embodies some conclusions and opinions which may complicate the solution of utility problems in certain localities, not because of fundamental error in the principles on which the report is based, but due to a belief on the part of the public that an endorsement of the principles underlying the report carries with it an endorsement of all conclusions and opinions expressed. There would be no criticism of the value of the report in suggesting that it could not safely be endorsed in its entirety by the street railway industry officially. It would be simply a recognition of the inevitable human element in the commission, the public and our companies.

"With reference to the report of the Chamber of Commerce of the United States' committee on public utilities the scope of the report and the personnel of the committee were limited to the business element and so more nearly represent the viewpoint of private capital which we represent. The endorsement of this report would seem to me to be in order.

"I believe such informal discussion of these reports as your letter should induce will prove to be informative, and as an exchange of views cannot fail to be helpful. The opportunity to participate in it is appreciated."

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RICHARD T. HIGGINS, *chairman of the Public Utilities Commission of Connecticut, who has been a student of electric railway problems and has appreciated the public's duty in this whole problem, as well as that of the railways, was asked for his opinion. Mr. Higgins' commission has recently made recommendations to the Legislature embodying many principles of the federal commission report. He said, with reference to action at Chicago:*

"Following important nation-wide investigations, reports, and recommendations pertaining to the street railway industry of the country, the mid-winter meeting of the American Electric Railway Association, to be held in Chicago, Feb. 10, should be one of the most important in the history of that association, and its deliberations will in a measure portend the future history of the industry.

"It is generally recognized and has been clearly demonstrated that the street railway industry as a whole has been and still is in a serious condition. It is confronted by obstacles which threaten its future continuity, efficiency and development. It is impossible to put a finger upon any one cause as the cause producing such condition, or upon any one remedy that will effect a permanent cure. We may be fairly familiar with cause and effect, but at this time we are vitally more interested in such proper remedy or remedies as will give life and vitality to this very important utility service.

"To my mind one of the most important factors in the resuscitation is honest co-operation between the utility and the public, without which all other remedies will have but partial effect. There is no railway or combination of railways as great or powerful as the public, and if the railway companies do not obtain the sympathy, good will and co-operation of the public which they undertake to serve, no amount of legislation or temporizing concessions will make the business a real success.

"Fair and impartial tribunals, principally the Federal Electric Railways Commission and the special committee of the Chamber of Commerce of the United States, have recently made careful study and investigation of street railway conditions, and have made concrete suggestions, not the least among them being co-operation. The investigations and reports of these tribunals reveal a commendable desire on the part of the public at this time to co-operate with and assist the utility.

"The proffered assistance and co-operation on the part of the public will undoubtedly be demonstrated by the early enactment of remedial legislation, which should afford at least a measure of relief. Mutual assistance and co-operation, however, cannot from their very nature be onesided. The utility companies themselves must join and should join whole-heartedly in the campaign.

"I believe a practical demonstration of such co-operation on the part of the utility should be developed and crystallized at the forthcoming meeting of the association.

"I do not wish to imply that co-operation is the only thing necessary, but, as stated before, I believe it to be one of the most important links in the chain of practical remedies intended for the benefit and preservation of this necessary public service."

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FROM *Minneapolis, Horce Lowry, president of the Twin City Rapid Transit Company, writes as follows in answer to a request for his comments on this question:*

"With reference to my own feeling in regard to the report of the Federal Electric Railways Commission, would state that I believe that this report is one of the best things that has happened in recent years for the interest of the industry.

"My particular reason for stating this is that both this report and the report of the committee on public utilities regarding local transportation of the United States Chamber of Commerce are reports written by men a majority of whom have no direct financial interest in street railway properties, and for this reason their conclusions carry weight where statements from active railway executives are generally discounted by the public."

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

Railway Advertises City

THE Tacoma Railway & Power Company and its associated companies announced on Dec. 24 a very substantial evidence of its appreciation of the spirit of co-operation shown to it during the last year by the city of Tacoma, its officers, civic associations, business men and citizens generally. This was an arrangement by which the advantages of the city will be advertised twice a week during the coming year in one of the New York daily papers. The announcement, which was published in the Tacoma papers on the day before Christmas, read:

> As an expression of our genuine appreciation of the increasing spirit of fairness and co-operation shown toward us during the last year by the city of Tacoma, its officers, civic associations, business men and citizens generally, and as evidence of our mutual interest in this community's vigor and expansion, we have arranged with one of the most widely read daily papers in the United States, the New York *Times*, to run a two-line advertisement on the front page twice each week for a year, calling attention to Tacoma and its many business and commercial advantages.
>
> It is with a feeling of confidence and optimism for Tacoma's future that we are extending to one and all our best wishes for a Merry Christmas and a Happy New Year.

The idea, which is that of Richard T. Sullivan, general manager of the Tacoma Railway & Power Company, has received general commendation by the Tacoma papers. The *News-Tribune* says: "It is a new and novel conception of a public utility's duty toward the city in which it operates," and the *Ledger* says that "It is bound to be of material benefit to the progress of the community." Mr. Sullivan in a public interview said:

"The idea of the public utility concern doing some directly helpful thing for the city other than the indirect benefit of giving transportation is somewhat unusual and rather original. While there will undoubtedly be differences between the public and the street railway in future, the fact that the company has shown substantial appreciation for fair and honest co-operation in the past will in a measure warrant such treatment in the future."

Safety First Alphabet

NOTE—This alphabet was originated by the United Railways & Electric Company of Baltimore and used successfully in a recent "Safety First" campaign among the public schools.—EDITORS.

A is for Accident,
Which you may meet
If you are careless
Crossing the street.

B is for Best,
And it's best to take care
To see you are safe
When you go anywhere

C is for Children,
And wise children play
Upon the pavement,
Out of harm's way.

D is for Doubtful.
It's doubtful if we
Would ever get hurt
If careful we'd be.

E is for Ears,
As well as for Eyes.
Use both for protection
If you are wise.

F is for Foolish,
And foolish is he
Who thinks not of safety
When safe he can be.

G is for Gong,
That the motorman rings.
"Heed me and be safe,"
It constantly sings.

H is for Hurry,
The brother of Harm.
You'd better go slow
Than lose leg or arm.

I is for Injury
You will invite
If you're not careful
When you alight.

J is for January,
Beginning the year.
To make it real happy
From danger keep clear.

K is for Knowledge
Or that which we know.
We should know to be careful
Wherever we go.

L is for Lookout
To see where we are,
And not to go running
In front of a car.

M is for Mindful
Of danger around.
So always be careful
Wherever you're bound.

N is for Neglect
Of safety advice.
Beware then, and let
This warning suffice.

O is for Only.
There's only one way
To keep out of harm—
Be alert all the day.

P is for Patience.
We'd better not go
With a rush and invite
Suffering and woe.

Q is for Queer.
It often seems queer,
People rush into danger
Without any fear.

R is for Railway,
Doing its best
To keep you from harm.
Won't you do the rest?

S is for Safety;
Be on the safe side.
Let care be our motto,
And caution our guide.

T is for trouble
Carelessness brings.
When you are careful
Danger takes wings.

U is for Useful
And useful advice.
If you ignore it
You must pay the price.

V is for Victim
Of unseemly haste.
Have a care; watch your step
And no time will you waste.

W is for Women.
They should alight
Holding with left hand—
Not with the right.

X is for Xtra
(If that you'll allow),
So be Xtra careful
Forever—and Now.

Y is for Young folks,
Who sometimes forget.
Be careful and you will
Have naught to regret.

Z is for Zealous.
Be zealous in care
To keep out of danger
That lurks everywhere.

London Illustrated Booklets

IN LINE with its forward-looking policy of "merchandising transportation" by informing the public and visitors about various things which may be seen on or near the lines of the London General Omnibus Company, the company has issued a series of illustrated booklets, of which those listed below are samples. These booklets show characteristic scenes or views and accompanying these are interesting descriptions of walking tours or sightseeing trips which can be taken from certain stations on the routes. The booklets are actually very instructive and illuminating to a person who has no opportunity to take the trips, but who may be interested in some of the subjects mentioned.

DORKING
THE HEART OF SURREY
GENERAL

EXAMPLE OF BOOKLETS DISTRIBUTED BY LONDON GENERAL OMNIBUS COMPANY

The following are some of the booklets issued:

"The Dorking Country," with twelve illustrations and descriptions of parts of the Dorking country.

"Little Histories." Some notes on the towns and villages near London, with 144 original photographs.

"Little Walks." Some rambles in the country around London, illustrated with 144 photographs.

"The Pilgrim's Way in East Surrey." Illustrated with thirteen original photographs and with sketch maps.

"Epping Forest." Illustrated with thirteen original photographs and a map.

"The Public Gardens of London." A new account of the gardens of the metropolis illustrated with fourteen original photographs.

"Memorials of London, No. 1—Naval and Military." Illustrated with fourteen original photographs.

"Memorials of London, No. 2—Artists and Craftsmen." Illustrated with thirty-four original photographs.

"Hospitals and Almshouses of London." Illustrated with fourteen original photographs.

The company evidently believes this pays, from its continued program of this sort.

Modern Trend in Publicity

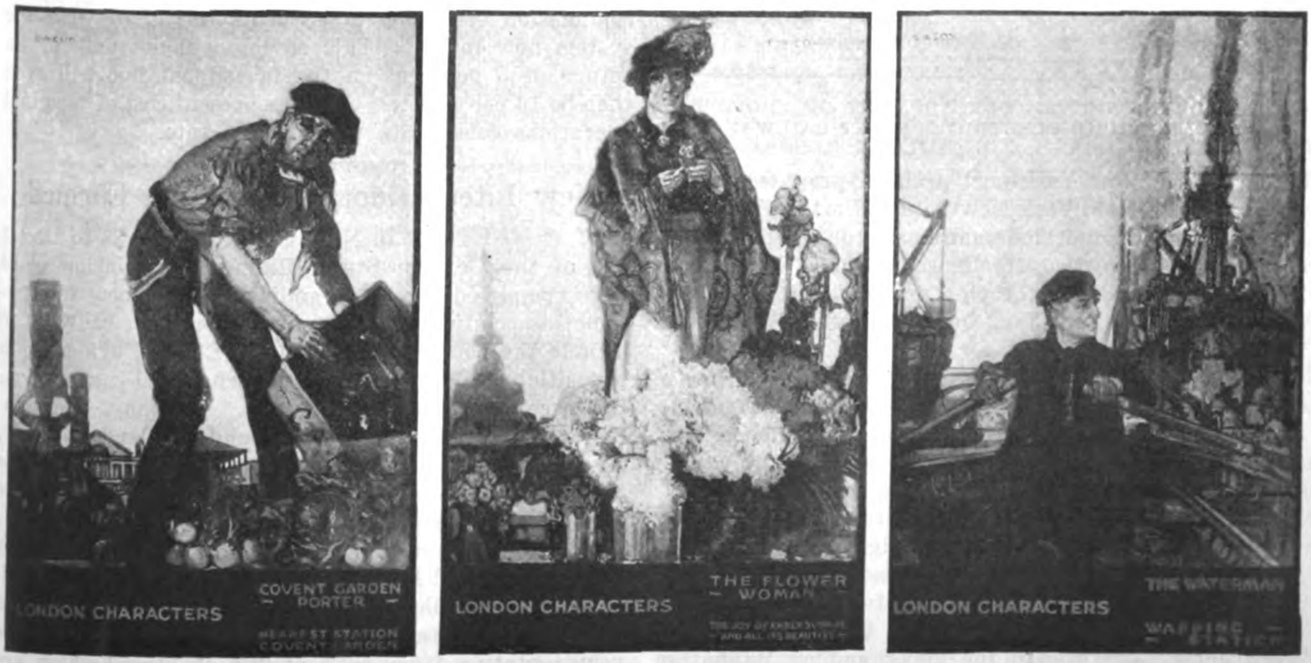
MYLES B. LAMBERT reviews the railway situation, particularly the publicity situation, in the January issue of the *Electric Journal* and declares the one biggest nut to crack is that of securing the good will of the public and its representatives. On the need for publicity he says:

> Practically all railway executives are alive to the potent force of this abstract thing which we call "publicity." In the past many thought it consisted very largely in having one man write copy for use in the papers or in pamphlets. But they know now that it is a very much bigger thing—a sort of phantom giant force that is susceptible of direction and guidance and, when properly guided, it is capable of producing remarkable results. It becomes really active only when every executive and subordinate officer is thoroughly imbued with the spirit of the game, and then only when it is the job of some strong staff officer or headed up by a manager of public relations, with a staff of copy writers.

If the Farmers, Why Not the Railways?

IT WAS recently announced in Chicago by the secretary of the National Dairy Association that there is now a plan for a nation-wide moving picture educational campaign through which it is hoped to bring the city and the farm closer together and thus solve many of the problems now confronting the farmers of the country.

For this purpose, according to the announcement, the Farmers' Film Corporation has been formed and co-operating with it in the work will be the Federal Department of Agriculture, State Departments of Agriculture and state agricultural colleges, the American Farm Bureau Association, the National Dairy Association, the American Bankers' Association, Grange movements, and co-operative buying and marketing associations throughout the country.

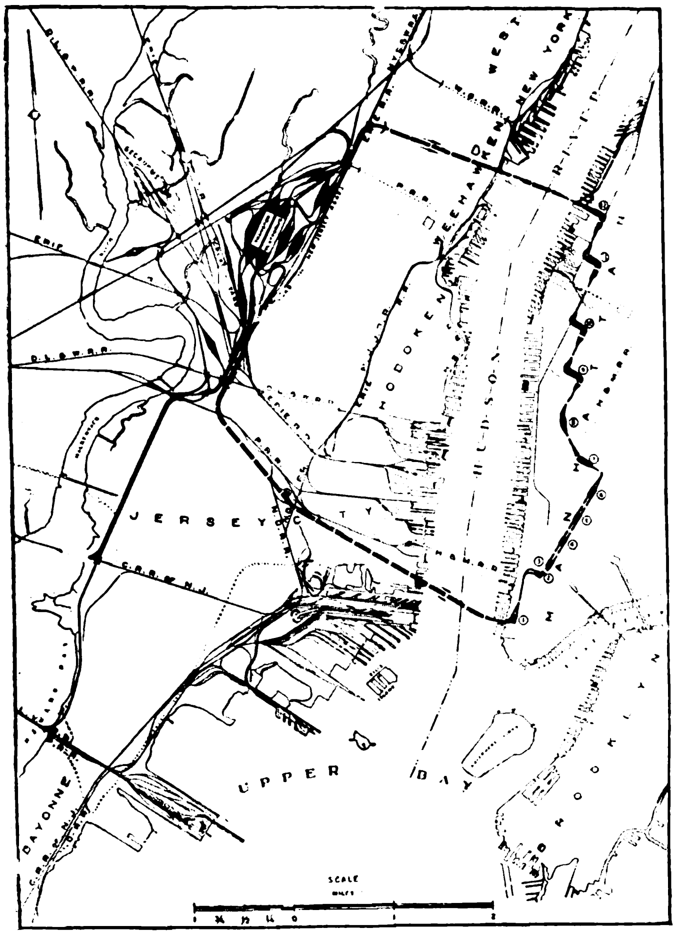


LONDON UNDERGROUND "CHARACTER" POSTERS

Electric Trains to Cut Terminal Costs

New York-New Jersey Harbor Development Commission Proposes to Solve Port Congestion by More Extensive Use of Belt Line Railroad Facilities with Tunnels and Automatic Electric Trains

A SYSTEM of outer and inner belt lines to bring direct rail connections to the greater part of the water front of New York Harbor and a plan for building an underground "automatic-electric" freight subway loop system for distribution on Manhattan Island are the principal features of the physical plan for the solution of the New York port problem proposed in the report of the New York-New Jersey Port and Harbor Development Commission addressed to the governors of the two states, Dec. 16, 1920, and made public Jan. 24, 1920. In addition the plan proposes belt line links in New Jersey, Brooklyn, Queens, Staten Island and the Bronx.



MAP SHOWING INITIAL DEVELOPMENT OF PROPOSED UNDERGROUND ELECTRIC FREIGHT RAILWAY

In Manhattan, the commission finds that neither a standard underground nor overhead railroad is feasible for distribution and therefore proposes an underground "automatic-electric" system. This is an entirely new form of conveyor railroad, built below two subway levels, which, serving the nine New Jersey trunk lines as well as the New York roads, will carry freight on short trains with special cars, moving without locomotives or train operators, and running between twelve distributing terminal points in Manhattan and the joint yards in New Jersey and toward the upper end of Manhattan Island.

The first stage of the "automatic-electric" development in Manhattan is indicated in the accompanying map. It provides for linking the New York Central Railroad with the New Jersey railroads through a loop from a joint yard in New Jersey and a spur to the New York Central's Sixth Street yard, to "do away with the surface tracks in Tenth and Eleventh Avenues" and provide equal service for each of the ten railroads at twelve union terminals in the lower section of Manhattan.

The commission describes the "automatic-electric" system as a joint railroad where incoming freight is transferred at extensive platforms to trail trucks and hauled by tractors upon special cars. The cars, operated singly in the yard, would be made up into eight-car trains, dispatched on either of two parallel tracks leading to Manhattan. Here there are twelve terminal distributing points, with manufacturing and warehouse floors above, with approach sidings underground. When a dispatcher at the joint yard throws an electric switch the eight-car train would start automatically; speed up to 14 miles per hour and run to the desired terminal, on the approach siding of which it would automatically come to rest. Return trains would start from forwarding sidings at the terminals, when a switch is thrown, and then proceed to the joint yard and come to rest.

Cars then proceed singly, manually controlled, to transfer platforms, their trucks bearing outbound freight are removed and they receive new inbound loads and continue in the cycle. Elevators handle individual cars from the "main line level" to the outbound and inbound terminal floors, where loads are discharged and new loads received.

The estimated cost of the automatic-electric railway with its tunnels, classification yards and terminals is approximately $200,000,000, of which the cost of the necessary tunnels is $91,000,000, rolling stock equipment $9,452,200, electrical installation $13,600,000, Manhattan terminals $60,000,000 and the balance to be used for steam road classification yards and connections in New Jersey.

The cost of handling freight on a per ton basis the commission estimates is 43 cents less than with the system now in use. This saving will not only pay a return of 5 per cent on the investment but will even then be 19 per cent less than the present cost of terminal operations covered in the railroad rate.

New International Association Formed

AT A MEETING in Nuremberg on Nov. 28 to Dec. 1 of the German Street Railway Association plans were completed for the organization of a new international association of street and interurban railways to include the companies in Central Europe, evidently in opposition to the existing international association. Representatives from Denmark, Germany, German-Bohemia, German-Austria, Finland, Holland, Norway, Sweden, Switzerland and Hungary took part in the meeting and these countries will be embraced by the newly formed association.

The president of the society is L. Spängler, director of the Municipal Railway in Vienna, and the vice-president is Dr. Wussow, general manager of the Berlin Street Car System. The board is composed of one representative from each of the countries which are concerned.

Sample Car Tried in San Francisco

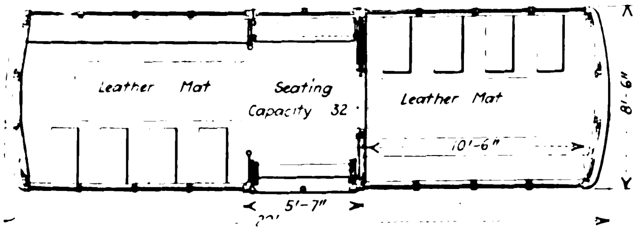
Center-Entrance, Single-Truck Experimental Car for Union Street Line of Municipal Railway in San Francisco Being Tested to Determine Its Suitability for the Severe Service Requirements

FOURTEEN per cent grades with sharp curves and fairly heavy traffic, all of which obtain on the Union Street line of the Municipal Railway in San Francisco, were believed to call for something far enough removed from standard practice to warrant the construction of an experimental car before the placing of an order for twenty cars which it is estimated will ultimately be needed to maintain adequate service on this line. A single car which was accordingly built to designs prepared by the city has just been delivered. It is to be put in actual service on the Union Street line and operated until city officials are satisfied that its design is correct, or until the advantage of any changes in design have been worked out and demonstrated in actual service.

The car is 29 ft. long over all and weighs, ready for service, 25,625 lb. It has a seating capacity of thirty-two and will handle from fifty-five to sixty passengers when all standing room is taken. The construction costs were high on a special order of this sort, of course. The total cost, exclusive of development charges, was about $15,000.

It is equipped with a 12-ft. wheelbase radiax Brill truck on 26-in. wheels, and has two Westinghouse 532-A motors, rated at 50 hp., with a gear ratio of 15:57. The underframe is all steel and the body semi-steel; that is, all steel except posts, floor and roof, which are of wood.

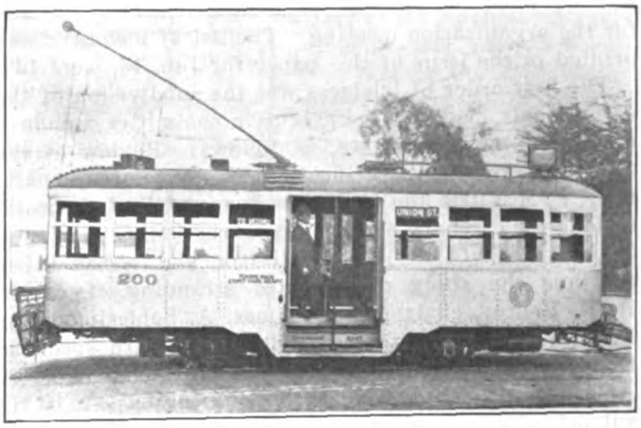
The light cars now operating on the Union Street line are equipped with manually operated track and wheel brakes. It was the purpose, in the design of the new car, to furnish air brakes for normal service and manual track brakes for emergency use, either of which must be able to hold on the steepest grade. Although the track brakes are satisfactory on the old cars, with a 7-ft. wheelbase, the 12-ft. base of the new car was so much longer that the shoes of track brakes require more than twice as much travel in order to avoid interference at the sharp changes of grade. This necessitated a greater throw for the hand lever than it was possible to secure. The air-brake equipment on the new car is therefore being supplemented with a geared brake of the multiplying type operated by a ratchet hand lever.



SEATING PLAN OF NEW CAR

The controller is the K-36-M General Electric type, in connection with which is used a Westinghouse 264-M-15 line switch operating as a remote-controlled contactor and breaker, the 600-volt circuit being actually broken under the car and not in the motorman's controller. This plan was deemed necessary because of the relatively heavy currents employed over portions of the route, and where a panic among the passengers on the steep hill might be very disastrous.

The roof of the car is made up of waterproofed three-ply wood, glued together like veneer, and shaped in process of manufacture to the roof curve specified. Full-width sections of the roof were made in 6-ft. lengths and were nested for shipment from the factory at Chicago to San Francisco. As there is no headlining the underside of this composite roofing is exposed and painted to form the ceiling, while the top is given a slush coat of white lead and then covered with roof canvas according to standard practice. A feature of the car frame, which is believed materially to strengthen it, is the 4-in. steel I-beam which runs from end to end of the car on either side. It passes just inside the riser of the top step at the car entrance.



NEW CAR READY FOR SERVICE

One end of the car is partitioned off from the conductor's vestibule and is intended for use as a smoking compartment. So far as possible it has been the purpose to keep all equipment provided with the car, such as headlights, fenders, etc., the same as the standard now in use on the larger municipal cars.

The new car was designed and constructed under the supervision of Paul J. Ost, electrical engineer, under the direction of M. M. O'Shaughnessy, city engineer. A. Meister & Sons Company of Sacramento, Cal., built the car under a contract the terms of which were actual cost plus a percentage.

Research Graduate Assistantships Open

THE Engineering Experiment Station of the University of Illinois, Urbana, Ill., directs attention to the research graduate assistantships which are maintained in the experiment station. With each of these there is an annual stipend of $600, with freedom from all fees for instruction except matriculation and a final fee.

Two new assistantships, in addition to the previous fourteen, have been established under the patronage of the Illinois Gas Association. The assistantships are open to graduates of approved American and foreign universities and technical schools, and must be accepted for two consecutive college years. At the end of this period, if all requirements have been met, the degree of Master of Science will be conferred.

The General Electric Company is proposing to sell stock to its employees on a basis which will allow them to pay for the stock on the installment plan.

American Association News

DETAILS OF CHICAGO CONFERENCE ARE NEARING COMPLETION—COMMITTEE WORK IS NOW IN FULL SWING—THIRTEENTH COMPANY SECTION IS ORGANIZED AT NEWARK, N. J.—ASSOCIATION'S REPRESENTATIVES ARE ACTIVE IN NATIONAL AFFAIRS

Power Distribution Committee Blocks Out Its Work

PRACTICALLY the entire membership of the Engineering Association committee on power distribution was on hand on Jan. 21 at association headquarters for the organization meeting. The list of members was printed in the issue of this paper for Jan. 15, page 147.

The first order of business was the subdivision of the assignments made by the executive committee among a number of subcommittees, as follows: Review of the overhead crossings specification, R. W. Eaton, chairman; F. McVittie and M. B. Rosevear; outline of specifications for catenary overhead construction, C. H. Jones, chairman; C. C. Beck, C. J. Hixson and W. Schaake; continue the study of standard stranding of cables, H. H. Febrey, chairman; A. Ames, A. Schlesinger and F. J. White; continue the study of standard specifications for wires and cables, F. J. White, chairman; A. Ames, H. H. Febrey, and C. A. Harrington; study the subject of composition of trolley wire and limits of economical wear, together with causes contributing to wear, M. B. Rosevear, chairman; C. C. Beck, R. W. Eaton and W. Schaake; report on the present status of direct-current lightning arresters in collaboration with the committee on equipment, F. McVittie, chairman; J. H. Drew, C. A. Harrington and C. J. Hixson; co-operate with the committee on way matters in regard to the preparation of specifications for wood preservation of power transmission poles, A. Schlesinger, chairman; J. H. Drew and C. H. Jones; revise existing specifications (other than those specifically provided for), C. J. Hixson, chairman; C. C. Beck, H. H. Febrey, C. R. Harte, C. H. Jones and M. B. Rosevear.

Contemporaneously with the meeting there was one of the subcommittee of the way and structures committee, having to do with timber preservation. During the session the subcommittee on wood preservation of the power distribution committee conferred with the other subcommittee and before the close of the meeting reported to the power distribution committee on a questionnaire which had been drawn up to secure information regarding results of applying preservative treatment to wood poles. The way and structure committeemen in attendance were H. H. George, Public Service Railway; W. R. Dunham, Jr., the Connecticut Company, and R. C. Cram, Brooklyn Rapid Transit Company.

The program followed during the all-day meeting of the power distribution committee was as follows: Each subcommittee outlined what it proposed to do in preparation of its report and received suggestions from the full committee as to policy and details. The list of topics given above furnishes an outline of this discussion.

The announcement was made that Mr. Harte will represent the association at the meeting of the American Engineering Standards Committee on Feb. 2. The association is now a member of this committee.

A message of congratulation and best wishes was ordered sent to C. L. Cadle, formerly chairman of the committee on power distribution, who was recently appointed Director of Public Works of the State of New York.

The announcement was made by Special Engineer J. W. Welsh that the American Institute of Electrical Engineers had been appointed by the American Engineering Standards Committee as sponsor in the preparation of specifications on conductivity of aluminum conductors.

The committee adjourned without setting a date for the next meeting.

Association Committee Appointments

The following Accountants' Association committees have been appointed:

Committee on Standard Classification of Accounts—H. L. Wilson, Boston (Mass.) Elevated Railway, chairman; W. H. Forse, Jr., Union Traction Company of Indiana, Anderson, Ind.; W. F. Ham, Washington Railways & Electric Company, Washington, D. C.; Robert N. Wallis, Fitchburg & Leominster Street Railway, Fitchburg, Mass.; P. S. Young, Public Service Railway, Newark, N. J.

Committee to Represent Accountants' Association at Convention of National Association of Railway and Utilities Commissioners—C. S. Mitchell, Pittsburgh (Pa.) Railways, chairman; B. W. Fernald, San Francisco-Oakland Terminal Railways, San Francisco, Cal.; John M. C. Horn, Illinois Traction System, Champaign, Ill.

CLAIMS ASSOCIATION

Below are given the Claims Association committee appointments for the current year:

Executive Committee—Past-presidents and present officers, together with the following: H. D. Briggs, Public Service Railway, Newark, N. J.; W. G. Fitzpatrick, Detroit (Mich.) United Railway; E. L. Lindemuth, Wilkes-Barre (Pa.) Railway; C. B. Proctor, Memphis (Tenn.) Street Railway.

Committee on Interchange of Claims Statistics—H. D. Briggs, Public Service Railway, Newark, N. J., chairman; J. S. Kubu, New York State Railways, Utica, N. Y.; W. F. Weh, Cleveland (Ohio) Railway.

Committee on Membership—C. G. Rice, Pittsburgh (Pa.) Railways, chairman; Wallace Muir, Kentucky Traction & Terminal Company, Lexington, Ky.; W. A. Tichenor, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.

Committee on Resolutions—A. G. Jack, Wilmington & Philadelphia Traction Company, Chester, Pa., chairman; H. O. Allison, Beaver Valley Traction Company, New Brighton, Pa.; C. A. Glawson, Macon (Ga.) Railway & Light Company.

Committee on Safety—R. E. McDougall, New York & Harlem Railroad, New York, N. Y., chairman; H. K. Bennett, Eastern Massachusetts Street Railway, Boston, Mass.; H. V. Drown, Public Service Railway, Newark, N, J.; C. G. Rice, Pittsburgh (Pa.) Railways; W. F. Weh, Cleveland (Ohio) Railway.

Committee on Subjects—W. G. Fitzpatrick, Detroit (Mich.) United Railway, chairman; R. E. McDougall, New York & Harlem Railroad, New York, N. Y.; Wm. A. Tichenor, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; H. G. Winsor, Puget Sound Electric Railway, Tacoma, Wash.

Last Call for Chicago Conference

Electric Railway Finances to Be the General Subject for Discussion—Reports of the Federal Electric Railways Commission Are to Be Acted Upon—Prominent Speakers Will Address the Banquet

AT THE mid-year conference of the association, to be held at Hotel Drake, Chicago on Feb. 10, two vital subjects will be up for discussion, namely, electric railway financing and the essentiality of the electric railway. To cover the first-named topic in all its phases men who are well versed in its intricacies have been secured.

In addition to the presentation of papers on finance, definite action is to be taken on the recommendations contained in the report of the Federal Electric Railways Commission and in the report of the special committee of the United States Chamber of Commerce on the essentiality of the electric railways. No other utility has had, says President Gadsden, the advantage of two such thorough investigations by impartial bodies and the reports undoubtedly represent the opinion of the American public. Action will also be taken on an amendment to the by-laws of the association to provide for six additional members on the executive committee to be elected at large. It is proposed that these shall be elected to serve for one year and shall not be eligible for re-election for a period of one year from the end of their respective terms of office. The paper on previous methods of electric railway finance, by James F. Fogarty, secretary the North American Company, will summarize the changing methods of financing capital improvements, the influence of low rates of return on such methods, the holding company and its probable future as well as war and post-war financial methods.

The Conference

Thursday, February 10

THE DRAKE

President PHILIP H. GADSDEN, *Presiding*

MORNING SESSION

AT 9:30

REPORT—Committee on Constitution and By-Laws, Lucius S. Storrs, Chairman.

PAPERS—"Previous Methods of Electric Railway Finance," James F. Fogarty, secretary the North American Company, New York.

"Present Requirements for Mortgage Securities," F. K. Shrader, Halsey, Stuart & Company, Chicago.

"Home Town Financing — Partial Mutual Ownership," S. B. Way, vice-president and general manager the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

"Necessity of Financing by Sale of Capital Shares," Chester Corey, vice-president Harris Trust & Savings Bank, Chicago.

"Municipal Aid in Electric Railway Financing," Melvin A. Traylor, president First Trust & Savings Bank, Chicago.

AFTERNOON SESSION

AT 2

REPORT—Special Committee on Report of Federal Electric Railways Commission and Report of Special Committee on Public Utilities of the Chamber of Commerce of the United States. Walter A. Draper, Chairman.

GENERAL DISCUSSION

ADJOURNMENT

Mr. Fogarty has already contributed several important papers at other meetings of the association.

The paper by F. K. Shrader, Halsey, Stuart & Company, Chicago, will cover the present requirements for mortgage securities. He will discuss the relation of cash investment to the amount of the loan, the influence of previous history on electric railway investments, the margin of earnings needed over interest charges, the flexibility of mortgage provisions, the necessity of ample staple earnings as a condition precedent to the re-establishment of credit to be derived from service-at-cost franchises and the characteristics of bonds which the market is likely to absorb during the next year or two.

"Home-Town Financing or Partial Mutual Ownership" will be discussed by S. B. Way, vice-president and general manager Milwaukee Electric Railway & Light Company. Mr. Way, who has been with the Milwaukee company for many years, has successfully developed a plan of selling the securities of the local company at home. His paper will cover the desirability of having a large local interest held by the car riders, their influence on local regulatory ordinances, the cost of capital procurable by this means and the methods of distribution.

The necessity of financing by the sale of capital shares will be discussed by Chester Corey, vice-president Harris Trust & Savings Bank, Chicago. Mr. Corey's paper will take up the importance of providing for a return on new capital that will invite new investments and the methods of regulation that will support such plans of financing. The subject of municipal aid in electric railway financing will be presented by Melvin H. Traylor, president First Trust & Savings Bank, Chicago. This paper will define the conditions under which municipal co-operation is required, the establishment of moral support instead of using the street railway as a political issue, the pledge of municipal credit through guarantees and municipal aid for the construction of rapid transit subway and elevated lines. The annual banquet, over which President Philip H. Gadsden will preside, will be held as usual on the evening of the conference. He will also have an important message to deliver to the industry. The principal speaker will be Hon. John W. Weeks, former United States Senator from Massachusetts, and, according to rumor, a possibility for President-elect Harding's cabinet. Senator Weeks occupies a high position in the national life of the country and his broad knowledge of the problems that confront the industrial world qualify him to convey a message of great value.

Another speaker will be Hon. James H. Wilkerson. formerly chairman Illinois Public Utilities Commission. Mr. Wilkerson's activities have in one way or another been almost continually and vitally associated with public affairs. He recently resigned upon the inauguration of a governor elected on a platform which advocated the abolition of the state public utilities commission, and has since returned to law practice.

Charles A. Leedy, the widely known humorist of the Youngstown *Telegram*, will close the program.

Important Facts About the Mid-Winter Conference

HARRY L. BROWN, western editor ELECTRIC RAILWAY JOURNAL, who recently accepted the chairmanship of the committee on transportation for the Mid-Winter Conference, reports that it has so far succeeded in securing half-fare rate on the return trip for members coming to the conference from points in the Central and Western Association territories. The Southwestern Association will probably grant the same rate, and also the Trunk Line Association. Only 10 per cent reduction will be allowed for points on the Pacific Coast, and probably no reduction will be allowed in New England, Canada and the Southeastern States, but members from these sections can secure the lower rate part way by buying tickets to points in one of the territories granting special rates and buying new tickets from there on, following the same procedure in returning.

Final arrangements for the special dinner for the ladies in attendance at the annual banquet of the American Electric Railway Association in Chicago, Feb. 10, have been completed. The price of the dinner is to be $4 and tickets may be secured at the time of the meeting at the registration booth at the Drake.

Utilities Heard at Housing Conference

AT A HEARING called by the Chamber of Commerce of the United States in Washington on Jan. 28 on industrial housing, Philip H. Gadsden, president of the association, testified that the public utility companies of the country would require $852.000,000 to provide proper heat, light, telephone and transportation facilities for the 1,250,000 houses and apartments which the country now needs to help relieve the housing situation. This total is reached by combining the estimates of the most reliable authorities in the public utility field.

Hearing on Proposed Two-Cent Coin Legislation

AS THE RESULT of the appearance of a committee headed by Charles L. Henry, of the American Electric Railway Association, before the House Committee on Coinage, Weights and Measures, a study is to be made of the public need for a 2-cent coin before legislation to authorize its coinage will be pressed. An unusual privilege was granted to the committee of electric railway men in that an informal hearing was granted by the committee on the bill which already had been reported favorably to the House.

Representative Vestal, of Indiana, the chairman of the committee, stated after the hearing that his main idea is to authorize the making of a Roosevelt coin. He does not insist that it be a 2-cent piece. So far as he is concerned, a Roosevelt nickel would be just as satisfactory as a tribute to the late former president. Information has come to his committee, however, that there is public need for a 2-cent piece. Before taking any step to amend the present bill, he expects to investigate the extent of this alleged need. If it develops that there is no necessity or general desire for a 2-cent piece, he states that he will be very glad to propose an amendment making the coin one of standard size, so as not to work a hardship upon street railway and banking companies.

Mr. Henry and his committee pointed out that the proposed 2-cent piece would make necessary very heavy expenditures in altering fareboxes, coin counters and coinholders. The necessary alterations on a farebox would cost $20 each. In addition, electric railway companies would have to go to the expense of adding a barrel to each of the coin holders worn by the car conductors. The point also was made that there is a possibility of the proposed 2-cent coin making necessary alterations in all 25-cent gas meters.

In addition to Mr. Henry, the committee consisted of Matthew R. Boylan, Newark, N. J.; H. B. Flowers, Baltimore; J. H. Hanna, Washington, D. C., and P. S. Young, Newark, N. J. The committee was accompanied by representatives of the Johnson Farebox Company and the Brandt Manufacturing Company, makers of coin counters.

Camden Company Section Expeditiously Organized

ANOTHER company section has been added to the rolls of the American Electric Railway Association. This time it is on the southern division of the Public Service Railway. The section is the second on that property and its official name is the Camden Company Section of the Public Service Railway.

On Thursday, Jan. 13, an enthusiastic organization meeting took place in the assembly room at the Camden carhouse, and seventy-six charter members were enrolled. This number, however, does not include those who are already members of the Newark section and who are to ask for transfer to the new organization. With nearly 1,000 employees to draw from it is anticipated that the membership will grow rapidly and the work that is planned for accomplishment will become a factor of vital importance in the establishment of better public relations in the territory served.

In order that there might be a better and clearer understanding of the actual workings and aims of a company section three attachés of the association's home office were present and spoke. Secretary E. B. Burritt outlined the purposes and aims of the association work, explained where company sections fitted in and listed the benefits to be derived from membership. Special Engineer J. W. Welsh spoke on the magnitude of the industry, and Henry Surguy, editor of the association's monthly publication, *Aera*, explained the place that the magazine has in the association work. C. W. Stocks, of this paper, also made remarks on the value of co-operative effort and the advantages that can accrue to individuals through membership in company sections. Remarks were also made by Martin Schreiber, Robert A. MacArthur and H. C. Stevenson.

After the speakers had had their say the report of the nominating committee was received and the following were elected: President, C. V. Wallace, superintendent of employment; vice-president, W. H. Wright, superintendent of distribution; secretary, George Stoll, investigator employment department; treasurer, P. A. O'Connor, claim department; directors, William Kille, president of Local 880 of the Amalgamated Association of Street and Electric Railway Employees of America; Robert A. MacArthur, superintendent of transportation, and John Hanf, superintendent of equipment.

The new officers were then installed and a committee appointed to draft a constitution and to prepare a program for the next meeting, to be held on Feb. 10.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Dallas Wants New Deal

New Franchise Sought With Sliding Rate of Return Dependent on Fare

The city of Dallas, Tex., co-operating with the officials of the Dallas Railway, is framing a new franchise in response to the request of J. F. Strickland, president, and other officials. As noted in the ELECTRIC RAILWAY JOURNAL for Jan. 22, page 196, the company represented that it could not operate except at a loss under the present franchise and carry out the commitments made at the time the franchise was granted.

NEW FRANCHISE BEING FRAMED

A strictly service-at-cost franchise is wanted by the Dallas Railway in lieu of the present franchise, which authorizes a return of 7 per cent on the property valuation, provided the company can earn it. The franchise is being framed at conferences between the city officials and officers of the railway. The request for a new franchise was preceded by a petition for authority to raise fares from 6 cents to 7 cents. This request was peremptorily refused by the City Commission.

It is the opinion of those in the franchise conference that the adoption of amendments to the present grant embodying the desired changes will be preferable to the negotiation of a new franchise. An obstacle to the negotiations is the inability on the part of the company to raise the funds necessary for it to carry out certain improvements and betterments to which it is committed under terms of the franchise granted in 1917.

In order to provide an incentive for good management and to enable the company to attract capital for expansion Richard Meriwether, vice-president and general manager, presented a tentative sliding scale of fares and of permitted return, to be regulated automatically, as a stabilizing fund created for this purpose. The scale was divided into various steps which would permit the return to increase as the fare is lowered or to diminish as the fare is increased.

NEW FARE SCALE SUGGESTED

Step 1, based on a fare of 5 cents with the sale of tickets at seven for 25 cents, would permit the owners to receive a return of 8¾ per cent on their investment. Step 2, based on a 5-cent fare with six tickets for 25 cents, would permit a return of 8½ per cent. Step 3, based on a 5-cent fare with eleven tickts for 50 cents, would permit a return of 8¼ per cent. Step 4, based on a straight 5-cent fare, would permit a return of 8 per cent. Step 5, with a straight 6-cent fare as at present, would permit a return of 7¾ per cent. Step 6, based on a 7-cent fare with the sale of tickets at four for 25 cents, would permit a return of 7½ per cent, and step 7, the last shown, based on an 8-cent fare with the sale of tickets at two for 15 cents, would permit only a 7 per cent return.

In presenting the scale Mr. Meriwether said that it did not contemplate any change in the present free tranfer system.

State Regulation Proposed in Minnesota

Senators W. F. Brooks and Arch Coleman, Minneapolis, have introduced a bill in the Legislature to place regulation of electric railways in Minnesota in the hands of the State Railroad & Warehouse Commission. The rate-making power will be vested in that body if the bill carries, although full control of operation, service and improvements will be retained by the cities, subject to appeal to the commission when such orders would affect the cost of service. It is provided that electric railway franchises may be exchanged for indeterminate permits which are to continue as long as the railway affected obeys the law, or until the city or State shall buy the property. Either city or company may appeal to the courts against unsatisfactory rulings by the state commission.

A bill by Senator George H. Sullivan, Stillwater, places control of operation, routing of interurban lines and similar matters under the jurisdiction of the State Railroad & Warehouse Commission. Still another measure provides that the personal property taxes collected from electric railways shall be paid to the state.

The Council of St. Paul has passed a resolution condemning any action to put control of the local electric railway in the state commission.

In commenting on the Brooks-Coleman bill Horace Lowry, president of the Twin City Rapid Transit Company, said:

> Our position is that we feel that this bill should pass, as it is only by such legislation that it will be practically possible for our companies properly to serve the cities in which we operate.
>
> For the past four years we have endeavored in both cities to obtain modifications and extensions of our existing contracts, which would place the property on a sound financial basis but have been unable to do so, and in view of these facts we feel that placing the rate-making power in the hands of an impartial commission, and the extension of our right to operate, subject to good behavior or purchase, would give confidence to the investing public to the extent that we would be able to obtain the necessary funds to improve the property and provide adequate service.

Subsidy Suggested

Seattle Councilman Would Have City Dip Into General Fund for $1,500,000 to Help Municipal Line

An ordinance proposed by Councilman John E. Carroll, providing for the payment from the general fund of $1,500,000 yearly for the benefit of the Seattle (Wash.) Municipal Railway, has been introduced in the Council. No action will be taken on the matter, however, until Mayor Hugh M. Caldwell has completed his report on the municipal railway situation. The Mayor has so far opposed any such suggestions.

HELP FROM GENERAL FUND

The proposed action of delving into the general fund of the city would increase the tax levy by about 6 mills, it is estimated by City Comptroller Harry W. Carroll. The city, in transferring $203,909 to the city railway fund on Dec. 23, to provide funds for meeting the railway payroll, made its first inroad into the general fund, raised by taxation.

Redemption and interest payments due on street railway bonds in 1922 will total $1,705,550, the city comptroller states. A principal payment of $833,000 on the $15,000,000 in bonds issued to pay for the car lines is due on March 1, 1922, and $10,000 additional is the redemption payment due on $100,000 of bonds issued for divisions A and C of the city lines acquired before the Stone & Webster property was taken over. Interest due on revenue railway bonds in 1922 totals $926,800 and $35,750 more is due on general railway bonds. This makes the total amount of redemption and interest falling due in the year 1922 $1,705,550.

The interest rate on the $15,000,000 in utility bonds is 5 per cent. The interest is paid in semi-annual installments of $375,000. Three payments have already been made. Two interest payments will be due in 1921, the first on March 1, and the second on Sept. 1.

MAYOR'S REPORT AWAITED

The question of whether the railway tax ordinance, providing for payment of municipal railway operation expenses from the general fund, shall be submitted to the voters on March 8, has been discussed in the Council, but as stated previously, it has been decided to defer action on this point until the Mayor's report on the railway is received.

Councilman Bolton expressed the opinion in Council that the only solution of the question is for the city to get back to the 5-cent fare, and eliminate transfers.

Unified System with Single Fare Suggested

Chief Executive of New York in Special Message to Legislature Says Greater City's Transit Franchises Must Be Revised

Nathan L. Miller, Governor of New York, in a special message to the Legislature on Jan. 24 invited prompt consideration by members of that body of needed changes in the law for the regulation of public utilities. He said the most urgent condition was that presented by the transit situation in the city of New York. The Governor's view is that sufficient facts are known to enable the Legislature to determine what action it ought to take. He favors complete unified operation in New York City with a single fare.

THE Governor surveyed New York City's traction history, past and present, and condemned those who laid the foundations for ample fortunes by dishonest manipulation of traction securities as well as those who seek to benefit politically from the misdeeds of the early promoters. After reviewing the history of regulation in New York the Governor said:

There are now three agencies dealing with transit in New York City—the Public Service Commissioner, the Transit Construction Commissioner, and the Board of Estimate and Apportionment, and the powers of each are in dispute. It is not strange that an apparently hopeless tangle results.

With respect to surface lines an equally hopeless tangle of authority exists. It was obviously intended to confer upon the Public Service Commission complete regulatory power over them. But the Court of Appeals decided that it would not infer from the language of the act an intention to do that in cases where local consents had imposed conditions as to rates of fare. That decision, however, has been limited to such consents granted between 1875 and 1907. The result is that the Public Service Commission has jurisdiction over some lines and different sections of the same line and a divided authority with the Board of Estimate and Apportionment over other lines or sections of the same line. In consequence the transportation problem in the city of New York has steadily drifted toward disaster.

While the present drifting policy in a crisis daily becoming more distressingly acute is plainly due to the unwise division of authority and responsibility already referred to, the cause of the difficulty lies deeper. The present problem has a background of crooked financing, which now subjects it to popular distrust and prejudice easily aroused by the wiles of the demagogue. The time has come to protect it from the sinister designs of selfish financiers and politicians. It will not be difficult to eliminate the baneful influence of the former. The market value of outstanding securities is undoubtedly much below the intrinsic value of the properties represented.

UNIFIED SYSTEM ESSENTIAL

The ultimate solution of the problem must be maximum service with minimum cost for the benefit of the users of the public transportation facilities, the majority of whom have no other means of transportation. The public are now in a position to escape from the consequences of past misdeeds or mistakes if, instead of utilizing them for sinister purposes to breed disorder in the public mind, advantage is taken of the present opportunity to lay the solid foundations for a forward looking constructive policy.

In the past capital has been attracted too much by the chance of speculative profits. Necessarily those profits are made at the expense of the investor and the traveling public. Poor and costly service and loss to the innocent holder of securities are the inevitable results. Certainty of a fair return must be the attraction to capital in the future, and that, I am sure, the public will readily accord for adequate service.

The public are now in a state of mind to take nothing for granted. Their past experience has been such that they now will rightly insist upon being satisfied that the actual facts justify any measures adopted. Some agency, having public confidence, impartially to ascertain the facts and courageously to apply the remedy appears to be demanded to extricate the problem from its present difficulties.

I think it plain that the foundations should now be laid for a completely unified system of transportation in the City of New York, and I believe any open-minded person who studies the subject at all will be forced to that conclusion. The single-fare plan appears to me to be important to the future development of the city and the relief of congestion with its manifold problems, housing and the like.

Extensions should precede rather than lag behind demand. That means that profitable parts of the system must maintain the unprofitable. In order to give the public efficient and cheap service every possible economy in operation and management must be effected and every unnecessary duplication of service eliminated. Necessarily the subways will form the backbone of the system. The elevated, surface lines and buses will eventually be merely auxiliary. If, however, the most efficient service is to be rendered at the lowest cost competition must be eliminated and the particular service which is best suited to each particular situation must be adopted.

The foregoing and other considerations all point to one completely unified system, and if that premise be granted it necessarily leads to the conclusion that ultimately such a system must be municipally owned. That was settled when the city decided upon municipally owned subways. A unified system of operation will be difficult with both public and private ownership of ways and structures. Of course the ultimate result cannot be accomplished in a day. The time, however, is ripe to lay the foundations, and to lay them properly we must commandeer the services of men of proved ability, in whom must be vested all the authority that can constitutionally be given, and such men must be selected utterly regardless of politics.

The subways contracts three and four lay at the threshold of any solution of the problem. They must be revised if the problem is to be solved. I have not studied them sufficiently to assert with dogmatic assurance precisely how they should be revised and am only referring to the matter sufficiently to indicate the problem with which we have to deal. Experience has demonstrated that the provisions for preferential payments are unfair to the city. The people who ride in the subways do not realize that in addition to their fares they are paying to maintain $200,000,000 of subway bonds.

In my opinion the term of the leases is too long. That would not be so vital if the provision for recapture would not penalize the city in case it should exercise its option before the expiration of the term. That also would appear to need revision in the interest of the city.

LOOSE TALK ABOUT HOME RULE

Experience has already demonstrated the unwisdom of separating the regulatory powers of the Public Service Commissioner from the powers under the Rapid Transit Act now vested in the Transit Construction Commissioner. Increased expense and uncertainty of authority have resulted.

To my mind the conclusion is irresistible that the authority and responsibility to deal with this problem must be completely centered in some single agency. A Public Service Commission with all the power under the Rapid Transit Act and all the power necessary to deal with the problem, reserving to the city the power to give the constitutional consent to routes and, of course, to pledge the credit of the city, appears to me to be the manifest solution.

The vital thing to do at the moment is to create the agency to deal with the problem with ample and undivided authority and responsibility. That agency when created must work out a plan from the ascertained facts in the public interest.

There is a good deal of loose talk about home rule in connection with this subject. I believe in the greatest exercise of home rule, compatible with good government, but the public interest must always be kept paramount, and when state power can be effectively exercised only by the state it ought not to be delegated to municipalities.

The deplorable condition of transportation in the city of New York precludes the thought that either the Legislature or the Governor should evade or seek to shift their responsibility.

I recommend that all public utilities be placed under the jurisdiction of one state commission, except that a commission be created for the First District with complete jurisdiction over the single subject of transit in that district.

I recommend that a commission of three be created with complete jurisdiction over the subject of transit in the First District, that the powers under the Public Service Commissions Law and the Rapid Transit Act be transferred to it with such amendment as further study may suggest and that the former independence of municipal control be restored regardless of the provisions of local consents or prior contracts. I further recommend that jurisdiction over all other public utilities in the state be conferred on the present commission for the Second District. Five commissioners for that work may be necessary.

I also recommend that the Public Service Commissions Law be amended so as to make the rules uniform as to all public utilities, including the power to suspend rates pending a hearing and determination. In view of the time required for some rate determinations there should doubtless be power to prescribe temporary rates pending such determination, with such safeguards as may be prescribed by the commission, and complete power should expressly be vested in the commission regardless of local consents or contracts.

It is impossible to exaggerate the importance and the value to the people, if well done, of the work of the Public Service Commission. That body should be elevated to the dignity and the standing of a court and should be removed from political influence. If a commission of five is retained I recommend that the terms be so arranged as to expire at intervals of three years, the ultimate term of the commissioners to be appointed upon the expiration of the terms of the present incumbents to be fifteen years.

The commissioners should not be burdened with administration. Instead of increasing the appropriations for the department over $180,000, as is requested, I have no doubt that it will be found possible to effect decreases by more efficient organization. How that should be done I submit to your consideration.

Governors Indorse Utility Regulation

The Governor of Arkansas has made public thirty-eight statements from thirty-eight Governors indorsing state regulation of utilities. He asked forty-three Governors for their views, and learned that practically nowhere in American commonwealth leadership is their sentiment for abolition of the public utility commission system.

According to the messages received by Governor Brough from the Governors of these states, no state with a corporation or public utility commission would consider such a "backward step" as abolition of state regulation of utilities. Several point out that there has been some criticism of the law due to increases in rates made necessary by abnormally high operating costs in the last few years, but predict that the commissions will be found reducing rates as soon as conditions permit. The Governors all declare that state regulation is the best method of controlling the utilities and protecting the public.

Of the forty-three states heard from, thirty-eight indorse commission regulation; secretaries of two report the Governors away from home; while three Governors advise that their states are without commissions. One of these, Texas, will probably consider establishment of a utility commission at the current session of the Legislature.

Wages Reduced 25 Per Cent in Albany

Vice-President of United Traction Company, Following Unfavorable Decision in Rate Case, Announces Cut in Pay

Wages of the trainmen in the employ of the United Traction Company, Albany, N. Y., are to be reduced 25 per cent, effective Jan. 28. Announcement to this effect was made over the signature of H. B. Weatherwax, vice-president of the company, in a notice to the men made public on Jan. 24 but dated Jan. 22. The new fares, referred to elsewhere in this issue, and the reduced wage scale become effective the same day.

THE company at Albany has an agreement with the Amalgamated Association. Union officials at first refused to discuss the matter. Later it was announced that a conference would be held at once with officials of the Hudson Valley Railway, Glens Falls, included in the system of the United Traction Company, and that meetings of the Albany and Troy unions would be held on Jan. 29.

The proposed 25 per cent reduction brings the wages of employees back to the rate of 45 cents an hour in effect last June, but which was increased to 60 cents by an agreement July 1, 1920. This agreement was to expire Nov. 1, 1920, but was extended.

The statement of Mr. Weatherwax follows:

During the month of June, 1920, the representatives of the Amalgamated Association presented demands to this company for an increase in wages from 45 cents to 85 cents an hour (for motormen and conductors, other employees to be increased proportionately) to take effect July 1, 1920, at which time the wage and working agreement with the association then in force expired. The previous rates of wages, subject to overtime payments at the rate of time-and-one-half had been as follows:

July 1, 1914, to June 30, 1916, 28 cents an hour; July 1, 1916, to Jan. 31, 1918, 30 cents an hour; Feb. 1, 1918 to June 2, 1918, 31 cents an hour; June 3, 1918, to June 30, 1919, 40 cents an hour; July 1, 1919, to July 1, 1920, 45 cents an hour.

DEFICIT OF $420,671

At the time the demands were presented, the company had accumulated a deficit incurred as follows:

1915	$88,766
1916	14,077
1917	95,704
1918	132,734
1919	178,561
1920, 6 months	102,750
Total deficit	$612,594
Surplus, Jan. 1, 1915	191,923
Net deficit	$420,671

The great loss was incurred for the simple economic reason that the company's revenues had not kept pace with its expenses, which under war-time impetus, grew by leaps and bounds. Labor and materials doubled in cost, in some cases increasing to the extent of 500 per cent, resulting in the company paying out more than it took in, despite two increases in fares, first from 5 to 6 cents and again from 6 to 7 cents.

It was quite obvious, therefore, that it was clearly impossible to grant a wage increase in the face of such a loss unless additional revenue could be procured with which to pay it.

The company and the association through its representatives held conferences on the question of wages where the above situation was fully discussed, and it was finally agreed that wages for motormen and conductors should be advanced from 45 cents an hour to 60 cents an hour, an increase of 15 cents, and other employees increased correspondingly, retroactive to July 1, 1920, such rate to continue in force for a period of four months or to Nov. 1, 1920, pending a decision from the public service commission on our application for increased fare to meet the additional expense, and provided that if such increase was granted the rate of 60 cents would remain effective for one year from July 1, 1920. The wages of other employes, not members of the association, were also proportionately increased, making a total increase to the payroll of the company of approximately $50,000 a month.

Although such action meant additional loss and compelled the borrowing of money with which to meet the wage advance, the company felt the necessity of keeping the property in operation for a period reasonably long enough to enable the public officials to fix a just and reasonable rate of fare.

Soon after the wage question was settled as set forth above, on Sept. 7, 1920, this company presented to the Public Service Commission, a petition requesting an increase of fare, setting forth the necessity therefore and the commission set the date for the first hearing upon said petition on Oct. 14, at which time an adjournment was taken to Oct. 28 and another adjournment until Nov. 10 (both on motion of the cities), when the case was closed. The case not having been decided on Nov. 1, the company continued to pay such advanced wages, awaiting the action of the Public Service Commission.

Since July 1, 1920, the company has not earned even its operating expenses and the net profit and loss deficit which was then $420,671, has been increased so that on Dec. 31, 1920, the total profit and loss deficit had reached $747,927.

On Jan. 21 the Public Service Commission handed down a decision effective Jan. 29, reversing some of its previous findings and refusing to grant this company any increase in revenues and imposing changes in fares and conditions that we estimate will further decrease the gross revenues of the company by not less than $50,000 per annum.

Notice is, therefore, hereby given to all employees of the company, members of the association and otherwise, that the rates of wages provided in the agreement effective July 1, 1920, will be discontinued at midnight of Jan. 28 next, and the schedule of rates thereafter will be those in effect on June 30, 1920.

Service-at-Cost for Grand Rapids

Trial Period of One Year Proposed as Means of Testing New Measure with a View to Its Adoption Permanently

Grand Rapids is going to try the service-at-cost franchise for a period of one year as a means of solving its somewhat complicated electric railway situation, and if satisfied will enter into a long-time agreement with the Grand Rapids Railway upon the service-at-cost basis. This is the understanding that has been reached by the City Commission. A meeting was held on Jan. 19 at which the city officials went over very carefully details of service-at-cost franchises in Cleveland and other cities and the commission unanimously agreed to enter into such an arrangement with the railway if a basis of valuation could be agreed upon.

AT THE present time engineers are working upon a valuation of the physical properties of the Grand Rapids Railway. They are expected to report about Feb. 1. In the meantime Ganson Taggart, city attorney, is preparing a service-at-cost franchise and members of the commission are preparing for a joint meeting with the railway. So far this company has not spoken openly concerning the proposed franchise, but members of the commission say that it is agreeable to such a proposition.

Through technicalities in the city charter, Grand Rapids can not enter upon a trial contract with the railway for any definite period of time, and the city commission can not submit an issue such as a service-at-cost contract to an utility unless it sets forth a definite period, therefore the City Commission has agreed to put the trial contract in the form of a city ordinance and pass it without submitting it to the people. If it is found satisfactory then the people will be asked to vote upon a five-year or ten-year franchise with the service-at-cost features incorporated.

Preliminary discussions on the part of the City Commission show that it is desired to have the step-rate of fare from 5 to 10 cents with the rate of return ranging from 5 to 9 per cent on the agreed valuation. No board of arbitration feature will be included in the contract and neither will the city assume any jurisdiction over wages outside of a few department heads.

The city engineers in charge of the valuation work are making three valuations, historical, replacement and five-year average from 1914. The company's engineer, W. L. Hagenah, Chicago, is also getting a valuation on the same three bases. Meetings are now being held by the engineers to settle problems of depreciation. Intangibles are not being considered.

The franchise of the Grand Rapids Railway expires on April 23. At the present time the company is collecting an 8-cent cash fare, with fourteen tickets for $1. Two months ago it put into effect, at the request of the City Commission, a new routing providing for a downtown loop and stubbing of several lines serving the west side of the city. Since then west side residents have complained about the street cars traveling in tandem style to the terminals and returning the same way. A request is now before the commission asking for the repeal of this ordinance. The railway desires its repeal.

L. J. DeLamarter, general manager of the company, has submitted figures showing that during the three months under the new routing ordinance the car mileage has been increased 85,329 miles and that 437,332 fewer passengers have used the lines. The increased cost due to the increased car mileage has been $29,617.

The annual report of the railway submitted on Jan. 21 to the City Commission shows that during 1920 the lines were operated at a loss of $147,070. The loss during December, including fourteen days with an 8-cent fare, was $1,811.

End of Surface Cars in New York Predicted

Although They Carry Now 40 per Cent of All Passengers, Street Congestion May Force Them from Main Thoroughfares

In his report to the Legislature of New York John H. Delaney, Transit Construction Commissioner with jurisdiction in Greater New York, points out that the new transit plan advanced by him a few months ago takes into consideration the fact that vehicular and pedestrian traffic in New York City is increasing to such an extent that it will soon be regarded as inadvisable to continue surface car operation either on the main arteries of travel or on the main cross-streets of Manhattan Borough, and that passenger transportation at present handled on the surface will in the future have to be diverted to crosstown subway "tie-lines" operated on a moving platform device or shuttle cars, or by omnibuses.

BECAUSE of the fact that the congested section of Manhattan has only eleven north and south through traffic arteries to serve more than 150 cross-streets, Mr. Delaney says it will be necessary to resort to "double-deck" subway trunk lines in the central traffic arteries of the city that remain available for transit lines.

During the fiscal year ending June 30, 1920, says the report, there was an unprecedented increase in the traffic of the rapid transit and street car lines operating in the city of New York. The number of passengers in 1920 as compared with those of the preceding year were as follows:

	1920	1919
*Rapid transit railroads ...	1,424,166,581	1,204,266,664
Surface lines ..	940,608.486	875,676,340
Total	2.364,775,067	2,079,943,004
Increase	284,832,063	104,430,815

*Including Hudson & Manhattan tubes.

These figures disclose that there was an increase of approximately 220,000,000 passengers in the rapid transit traffic during the fiscal year just ended, of which all but 9,000,000 of the increase was carried in the subway and elevated lines, making up the Dual System in which the city has a large financial interest. Mr. Delaney said:

> With an annual increase in traffic exceeding 10 per cent it is obvious that provision must be made without delay for extension of local transit facilities for all sections of the city. When the Dual Contracts were signed in 1913 the rapid transit lines, carried 810,000,000 passengers for the twelve months immediately preceding the adoption of the new program. There has been an increase of approximately 615,000,000 passengers, or 76 per cent in the intervening seven years, and the new trunk lines are already showing congestion.

$350,000,000 NEEDED FOR NEW LINES

> Intensive study has been made of the rapid transit needs of the future since the creation of the Transit Construction Commissioner's office and in August a report was made on a comprehensive plan intended to meet the requirements of the various boroughs of the city during the next twenty-five years. The plan was so laid out as to encourage municipal growth in every direction and to prevent abnormal and congested conditions in certain sections and strangulation of growth in other areas. As laid down it is intended that the transit plan and the general city plan for new thoroughfares and highway improvement shall be co-ordinated in order that the best results may accrue to the general public. The growth of traffic per annum has been constantly in excess of the annual per capita growth of the city.
>
> The enlarged system as laid out to care for the city's needs during the next twenty-five years would provide for an annual traffic of 5,000,000,000 passengers. Projected lines and extensions to the existing lines, wherever they may originate in outlying boroughs are planned to enter and traverse the heart of the city which, from the transit viewpoint, is the area in Manhattan south of Central Park between Second and Tenth Avenues.
>
> No close estimate of the cost of construction of the enlarged transit system is possible at present and it is not intended that the comprehensive scheme as laid out in its entirety will be undertaken at once, but that it should be proceeded with methodically and continually. At pre-war prices it is estimated that the lines contemplated in the suggested program for the next twenty-five years would cost approximately $175,000,000 for construction. At present prices, however, this cost would amount to close to $350,000,000, exclusive of equipment, interest during construction, engineering and superintendence. For proper facilities and equipment an additional $200,000,000 would probably be required at once.

Right to Open Wage Matter to Be Arbitrated

Judge Edward J. Jeffries has been appointed as arbitrator to represent the men in the controversy relative to the 20 per cent reduction in wages proposed by the Detroit (Mich.) United Railway. Judge Jeffries will act with John A. Russell, appointed to represent the company. They will select the third arbitrator. The men maintain that the company had no right to break the wage contract now existing by opening the question before the expiration of the contract agreement. In the event the present board should decide that the wage agreement can be opened the next step will probably be the arbitration of the wages, although there seems to be some doubt as to what action will be taken next.

The men refused to appoint an arbitrator until advised by the company that it was ready to accept the condition that the only question to be arbitrated now is whether or not the subject of wage adjustment can be opened at this time without the union's consent.

In advising the officials of the union of its acceptance of their view regarding the matter the company cited the fact that the situation is urgent and requested the men to name their representative without delay.

The differences to be arbitrated are set forth as (1) the right of the parties or either of them to open the agreement and (2) the foregoing having been decided affirmatively, to proceed then forthwith to arbitrate sections of the existing agreement dealing with working conditions and wages.

In concluding their reply to the company's communication officials of Division 26 of the Amalgamated Association said:

> We are compelled to inform you that until the subject which is to be arbitrated is mutually agreed on, in accordance with our agreement, we must decline to name our arbitrator and will await any further suggestions that you have to make on this matter.

Cities Urge Electrification

Municipalities along the lines of the London, Huron & Bruce and the Stratford-St. Mary's branches of the Grand Trunk Railway in Western Ontario are organizing a campaign for the electrification of both lines.

The London, Huron & Bruce line runs northward from London to Wingham, a distance of about 50 miles along the shore of Lake Huron, and the Stratford-St. Mary's branch from London to Stratford, about 40 miles. Each railway taps a very rich farming country, but the service on the steam lines is infrequent and unsatisfactory.

The government of the Dominion of Canada having taken over the Grand Trunk Railway the municipalities believe electrification will be secured without difficulty. If the scheme is carried out the electrified lines will be linked up with the London & Port Stanley Railway, which is owned by the city of London and is operated between that city and Port Stanley, an important harbor on Lake Erie. The system of the London & Port Stanley Railway consists of 35 miles of railway.

$550,000 Forfeit Bond Refused

The General Electric Company has offered to pay the city of Dallas, Tex., $550,000 in cash, the amount of the two bonds which the company executed in 1917 as a guarantee that it would build two interurban lines, each at least 30 miles in length, if the city in turn would relieve the company from all obligation in connection with the building of the lines which are proposed.

The City Commissioners at a meeting on Jan. 15 declined to accept the payment of the forfeit, but in lieu thereof extended the time in which the General Electric Company, owner of the Dallas Railway, is to comply with the terms of its commitments. The company now has sixty days from Jan. 15 to begin work on the first interurban and eighteen months to begin work on the second. The first interurban must be begun by March 15, 1921, and the second interurban by Sept. 15, 1922.

The General Electric Company said:

> So confident are the petitioners that the building of these roads in the near future will entail upon them an unreasonable loss that the General Electric Company interests would be grateful to the city of it will permit them to pay to it now the amount of said two bonds, to wit, $550,000 in cash.

It was declared, however, in the petition that if the city is unwilling voluntarily to accept the forfeit as tendered "it is not the purpose of petitioners to compel it so to do by putting the city to the enforcement of its legal rights, but it is their purpose to perform the promise made by the said Hobson and carry out and fulfill same in good faith."

Near the End

Period Drawing to a Close in Which to Complete Toledo Settlement—Commission Reported Selected

Less than a week remained on Jan. 26 to put the cost-of-service plan at Toledo into operation. The ordinance provides that the railway shall be turned over to the new Community Traction Company, "free from all mortgage encumbrances." To bring this about the Doherty interests would have to raise $1,900,000 cash in addition to the cash required to place the ordinance in operation.

Henry L. Doherty asked all Toledo banks to participate in a loan of $2,700,000 to take care of this item, the operating finance and equipment liens. He offered them the $8,000,000 of bonds of the Community Traction Company, as collateral and agreed to pay 12 per cent interest for the money. The deal would be made with the expectation that the whole proposition could be refinanced later in the year.

Toledo bankers have said many times they would not be able to help in the situation because such a large amount of cash was involved and the loans of most of the larger banks are up to their legal limits and the limits imposed by the Federal Reserve Bank.

MORTGAGES TO BE CONTINUED

To the end that the plan put before the city by the Doherty interests last week might become effective so that the ordinance could begin to operate on Feb. 1, James Martin of the city legal department and George Welles, attorney for the company, began work on an agreement between the city and the Toledo Railways & Light Company, by which the mortgage encumberance could run on for a few months and to protect the city interests all the bonds of the traction property would be held in trust by the sinking fund trustees of the city. This would not allow the company any return on the property until the mortgage was lifted.

The city officials have agreed to waive the exact wording of the ordinance in order to put the cost-of-service plan into effect. It is also desired to get the approval of the City Council. There is some question, however, about the legality of the scheme which might endanger the plan at some future time. It was doubted whether such an agreemen would be ready for submission to Council on Monday.

Charles A. Frueauff, counsel for Henry L. Doherty, was expected in Toledo on Jan. 24 to approve a final agreement to make the ordinance effective.

The Public Utilities Commission has agreed to let the Community Traction Company, originally incorporated for $100, proceed to issue $10,000,000 in common stock, $2,000,000 in preferred stock, and $8,000,000 in twenty-five-year first mortgage bonds. It also gave its approval to the transfer of the Rail-Light property over to the Community Traction Company.

When the new ordinance goes into effect fares will be reduced from 7 to 6 cents and transfers from 2 to 1 cent.

It is understood that the street railway board of control has selected a man for commissioner of transportation under the new grant but that the board is withholding the name until the operation of the cost-of-service ordinance is assured.

Deferred Repairs Cost City of Seattle $1,500,000

In a public speech recently D. W. Henderson, superintendent of the Seattle (Wash.) Municipal Railway, reviewed the problems of municipal ownership, stating that the railway lines would have gone into the hands of a receiver had the Stone-Webster Company not sold them to the city for $15,000,000. Mr. Henderson was for many years superintendent of transportation of the lines at Seattle when they were under private operation.

He said the private company had made only $\frac{3}{8}$ of 1 per cent annually on the lines during the last five years of their operation and that the city officials "no doubt failed to study details of cost" of the lines before they purchased them, erroneously believing that the company "was making all kinds of money on a 5-cent fare." He expressed the belief that if the city on taking over the lines had immediately increased the fares it would be reducing fares now instead of increasing them.

In explaining mounting costs, Mr. Henderson pointed to two wage increases. These, he said, were unavoidable. He also stated that the Puget Sound Traction, Light & Power Company suspended all repairs the moment the city began to talk seriously about taking over the lines and that the city has been forced to spend $1,500,000, when labor was highest, on repairs alone. He stated that operating costs had been reduced 4.2 per cent in the last year.

Construction Abandoned — Construction Proposed

The construction of the proposed interurban railway from Dallas, Tex., to Wichita Falls, a distance of approximately 110 miles, has been temporarily abandoned, due to inability to finance the line successfully. The negotiations have been dropped until the financial conditions are improved.

In the meantime the Dallas (Tex.) Railway has been given to understand by the city of Dallas that it must carry out its commitments to build the two interurban lines, each at least 30 miles in length, and **in return J. F. Strickland, president of the Dallas Railway, has revived interest in the proposed line to Terrell. Mr. Strickland announces that his company is now carrying on negotiations with Terrell and intervening towns with a view to building this line first, and that after it is built he will turn his attention to construction of the other line.**

Commissioners Disagree

Judge Reed, Kansas, Against Theory of Need for One Body to Hear Wage and Rate Cases

Judge Clyde M. Reed of the Kansas Industrial Court refused recently to sign the biennial report of the court to the Governor. Instead he sent to the Governor a special letter calling attention to errors in the report as submitted by Judges Huggins and Wark relating to the work of the court.

WAGES AND RATES COUPLED

In the letter of Judges Huggins and Wark appears this statement:

> After several wage cases had been brought on the industrial side, it was discovered that a shorter and cheaper way to arrive at the matter of increased wages was to try the wage question out at the same time as the rate increase application by the utilities.

There was not, according to Judge Reed, any substantial basis for a statement of this kind. On the other hand Judge Read said:

> If any such practice has been followed I am ignorant of it. It is true that wages are operating expenses and the operating expense is an important factor in the adjustment of rates to a public utility, but following that line of analogy every public service commission would be an industrial court, including the public utilities commission, which was the predecessor of the present Kansas Court of Industrial Relations. It will not be seriously contended that this is the case.
>
> There has been some insistence on the part of some of the utilities companies that the question of wages and rates must be tried together. The court has not accepted that theory as a governing rule and in only one instance have these questions been considered together in an industrial case.
>
> Sound public policy, in my judgment, requires that the matter of wages and rates be considered separately. There is a relation between wages as an operating cost and the rates of common carriers and public utilities, but they are separate factors, each of which should be considered on its merits.

Judges Huggins and Wark in their statement said:

> We have attempted in this report to outline our industrial and utility activities separately, but the two phases of the work are, and have been, so closely related that it has been quite impossible accurately to separate them. Some of the cases that have been docketed and heard on the industrial side have involved utility problems, and, on the other hand, some cases filed on the utility side have involved industrial questions.

JUDGE REED DISSENTS

Judge Read did not agree with the sentiments so expressed. In his letter he said:

> In the discussion now current as to the best method of organizing the court for future work, it may be accepted as a statement that the industrial and utility work is so closely interwoven that it cannot be separated. That such a conclusion would be unjustified is evident from an analysis of the cases which have been filed on the industrial side and heard by this court. Since the court was established twenty-eight industrial cases have been filed, of which five are still pending.
>
> An analysis of the industrial cases heard by the court would reveal the fact that in but one case, that of the Topeka Railway, was the question of rates and wages brought into the same case for consideration by the court. The question of wages and rates was present in the Wichita Railway case, but the court had no direct jurisdiction over the question of rates and that was settled by the City Commission of Wichita.
>
> **An analysis of the cases heard to date gives no support whatever to the theory that there is any vital necessity for considering wage and rate cases by one body. This is a matter to be determined on general policy.**

Colonel Kealy Among His Men

Incident to the luncheon to Col. Philip J. Kealy upon his retirement from active supervision of the management of the Kansas City (Mo.) Railways the employees assembled before the offices of the company for the group picture shown in the accompanying illustration. Colonel Kealy appears in the center of the group of his co-workers, only some of whom are shown in the reproduction on account of space limitations.

Some of the remarks by Colonel Kealy to the men were included in the account of the luncheon which was published in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 15. Among statements not recorded previously was the response of Colonel Kealy showing appreciation of the evidence on the part of the men that his work at Kansas City had resulted in substantial and continuing loyalty of service to the community and to the utility.

COLONEL KEALY THE CENTRAL FIGURE AMONG A GROUP OF HIS EMPLOYEES

He said that the good judgment of the men in adopting the co-operative plan had been vindicated, for under it there had been great improvement of service to the public and material benefit to the employees. Moreover, employees elsewhere, more particularly in the East, were finding the plan as installed at Kansas City to be almost an ideal application of the general principle of participation toward which employers and employees were more and more tending.

Back Pay Obligations Anticipated by P. R. T.

Payment of back wages of $1,000,000 to the trainmen of the Philadelphia Rapid Transit Company will be made on Feb. 1. This announcement was made by President Thomas E. Mitten of the company to the men at the annual meeting of the members of the Co-operative Welfare Association, to which reference was made in the ELECTRIC RAILWAY JOURNAL of Jan. 22, page 187. Mr. Mitten is quoted as follows:

> You remember, and I have no doubt you remember well, that when I last talked to you here and you agreed to await the payment of your back wages until the company could earn the money I then said I hoped the company would be ready and able to pay early in the year 1921.
>
> It will take at the present rate of earning until about May 1 to get the million dollars owing to the men, and that is about what it amounts to with interest from November. It will take all that we can earn after paying the necessary bills up to May 1 to save that amount, but I am very glad to tell you that through an arrangement which we have been able to make with Mr. Stotesbury's bank we shall pay you in full with interest on Feb. 1.

Transportation District Plan Approved

Mayor Thompson's traction plan for Chicago which provides for 5-cent fares and the creation of an independent taxing body to be known as the Transportation District, which would own and operate the surface street railways, was approved by a vote of eight to two by the Local Transportation Committee of the City Council on Jan. 17.

The vote was taken very unexpectedly with eight Aldermen absent and without waiting to hear various civic organizations which had given notice that they wished to be heard. It was expected that the matter would be placed before the City Council on Jan. 19 for expected approval of that body and then sent to the State Legislature without alteration.

Know Your Employees!

The January issue of *Sparks*, published by the Toledo Railways & Light Company, which is controlled by H. L. Doherty & Company, printed in full the paper on "Labor Efficiency" read by Frank R. Coates at the Doherty managers' meeting in New York. Mr. Coates believes in welfare work but not in a bonus system. He has suggested seven ways of obtaining greater efficiency in operating Doherty interests. They are as follows:

1. Know your employees.
2. Have your employees know you.
3. Have your workers and co-workers contented.
4. Treat them all fairly and squarely.
5. Let them know by practical examples that their future depends entirely upon themselves.
6. So educate all in your employ that they respect and revere the American flag, and that they know for a certainty that the same principles that the flag symbolizes are the underlying principles in your business.
7. Lastly, have all in our great organization follow out to the fullest extent, our slogan: "Pride of Workmanship" and "Pride of Service."

Franchise Settlement Plan Started

Initiative petitions for the passage of a city ordinance providing for the service-at-cost plan of street railway transportation proposed by the Detroit (Mich.) United Railway have been filed with the city clerk. More than 8,000 signatures have been secured for the petition, it is reported, a number greatly in excess of that required by the city charter.

If the proposed ordinance is laid on the table or meets with adverse action on the part of the Mayor or the City Council the proposition will be submitted to the voters for decision at a coming election.

A printed copy of the ordinance will be sent by the Detroit United Railway to each of the 320,000 registered voters of Detroit to afford them an opportunity to study the ordinance provisions prior to the election.

Articles of incorporation for the Detroit-Service-at-Cost Railway, according to the plans of the Detroit United Railway, have been filed with the Secretary of State at Lansing. The Public Utilities Commission has been asked for permission to start such a project.

The stockholders are Frank W. Brooks, A. F. Edwards and A. A. Peters. They are respectively the president, vice-president and treasurer, and secretary of the Detroit United Railway. The authorized capital of the new company is stated as $25,000, a nominal sum.

The new company proposes to acquire, own and operate street railways in the city of Detroit, within the boundaries of the city as the same may from time to time exist, and in the city of Highland Park and the village of Hamtramck.

Bill for Franchise Readjustment

There has been introduced in the Ohio Senate a bill designed to terminate perpetual franchises held by the Columbus Railway, Power & Light Company on fifteen Columbus streets. The bill is the result of prolonged dissension between the company and the city over adequacy of service.

The rate of fare until a little more

than a year ago was eight tickets for 25 cents. Repeated attempts to get a higher fare during the war failed, but eventually Council granted a fare of 6 cents cash, with five tickets for 25 cents, the understanding being that certain betterments would be carried out.

It is argued by the Columbus Street Railway Home Rule Association and others interested that with the termination of the perpetual franchises the city will be in a much better position when it makes a new contract for service. The blanket franchise ends on April 29, 1926, and under the bill introduced in the Senate the perpetual franchises would be ended at the same time. Nine of the principal streets in Columbus are occupied by lines under the perpetual franchises, while other important streets are under the same certain betterments would be made.

Ordinance Would Permit Cleveland Railway to Sell Stock

Following a letter of John J. Stanley, president of the Cleveland (Ohio) Railway, to Fielder Sanders, City Street Railway Commissioner, in which it was pointed out that the company needed funds for improvements and extensions, an ordinance has been introduced in Cleveland City Council by Councilman Dittrick authorizing the sale of $3,000,000 of capital stock of the Cleveland Railway at less than par. The ordinance amends the Tayler service-at-cost franchise. It follows:

Be it ordained by the Council of the city of Cleveland, State of Ohio:

Section 1. That the Cleveland Railway be, and it is hereby, authorized to issue and sell $3,000,000, and no more, of its capital stock at not less than $80 per share, a discount that will yield not more than 7½ per cent interest per annum to the purchasers of said $3,000,000 of stock, said issue to be subject to approval by the Public Utilities Commission of Ohio; the proceeds of the sale of said stock to be used to pay or reduce the company's floating indebtedness, to pay for such extensions, betterments and permanent improvements as have been or hereafter may be authorized by the City Council of Cleveland and for any other purpose or purposes for which such proceeds may be lawfully used under the provisions of ordinance No. 48,845-A as amended by ordinance No. 49,970, the difference between the par of said capital stock and the amount realized from its sale to be amortized from earnings within two years after its issue; that the company be, and it is hereby, directed to charge to a stock discount account as the stock is sold said difference between par and the selling price and to deposit in bank the sum of $25,000 per month as a sinking fund for the amortization of said difference, crediting said sums from month to month to said stock discount account until said account is extinguished, and that thereupon the company use said sinking fund to reduce the amount of the then outstanding bonds or capital stock of the company or to pay for extensions, betterments and permanent improvements; that said monthly sums may from time to time, with the express approval of the Council, be invested in securities or used to retire stock or bonds or to pay floating debt or to pay for extensions, betterments or permanent improvements instead of being deposited in bank until the extinguishment of said stock discount account; that the rate of interest upon the present outstanding bonds and stock of the company shall not be increased by this permission to sell additional stock.

Sec. 2. This ordinance shall take effect and be in force from and after its passage and legal publication.

Mr. Stanley's letter to Mr. Sanders stating the company's needs was published in the ELECTRIC RAILWAY JOURNAL for Jan. 22.

News Notes

Thirty-three per Cent Increase for Power.—The Cleveland (Ohio) Railway has announced that the Cleveland Electric Illuminating Company has asked the State Public Utilities Commission to approve a 33 per cent increase for current supplied to the railway.

Home Rule Appeal in Indiana.—Mayor Benjamin Bosse of Evansville, Ind., and the City Council have appealed to the Legislature to repeal the law creating the Indiana Public Service Commission and to restore power to regulate public utilities to the cities of Indiana.

Rehearing Asked in Freight Case.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has filed with the Wisconsin Supreme Court a motion for rehearing on that section of the recent decision of the court in the interurban franchise case dealing with the transportation of freight. The company asks that the injunction against carrying freight on the Milwaukee-Waukesha line of the company be limited to that portion of the line east of the west line of Layton Boulevard in the city of Milwaukee. The case was reported in the ELECTRIC RAILWAY JOURNAL of Dec. 25, 1920, page 1307.

Employees Fully Informed.—The Jan. 15 issue of *Trolley Topics* contains a full reprint of the letter delivered by J. P. Barnes, president of the Louisville (Ky.) Railway, to each Councilman and Alderman previous to the aldermanic meeting of Jan. 4, replying to the report of the Railroad Committee of the General Council. It was the desire of Mr. Barnes through *Trolley Topics* to acquaint all employees of the Louisville Railway with facts about the railway's financial condition and to point out certain wrong deductions in the report of the Railroad Committee to the Board of Councilmen submitted on Dec. 28 last.

Public Service Is the Railway's Function.—E. F. Sweet, former congressman and at present assistant secretary of commerce at Washington, D. C., recently reiterated the findings of the Federal Electric Railways Commission at the twelfth annual banquet of the Jackson (Mich.) Chamber of Commerce. Mr. Sweet remarked that one of the first things upon which the members of the commission agreed was the idea that the function of railroads was public service and not private profit. An account of Mr. Sweet's review of the commission's work was published in the ELECTRIC RAILWAY JOURNAL for Jan. 22, page 171.

Ambitious Auto Proposal in Portland.—The City Council of Portland, Ore., has been asked to consider an application for franchise to operate a bus line between Portland and Linnton, with large automobile buses, and with a 10-cent fare. W. H. Hyatt, who applies for the franchise, states that he has succeeded in interesting representative business men of Portland and that he is certain he can succeed in the organization of such a company. He was given thirty days in which to make a report to the Council. Several applications have been submitted by other bus operators, but residents of Linnton have urged that no extensive franchises be granted to present operators as the service and charge have been unsatisfactory.

Paving Suit Suspended.—The City of Dallas, Tex., will suspend all suits and litigation in preparation of being filed against the Dallas Railway to compel the company to carry out certain improvement projects, with special reference to paving between its tracks and for a specified distance outside of each track on streets which the city is improving. Action looking to this end was taken by the Board of City Commissioners after a committee of the directors of the traction company had called on the board and had agreed to accede to the city's order for paving certain streets and making other improvements. The company has agreed to set aside all revenue after paying operating expenses, including taxes, maintenance and accident reserves, all interest and fixed charges, including payments on car trust certificates for a period of five months from Dec. 1, 1920, to May 1, 1921.

Program of Meeting

Canadian Electric Railway Association

The complete program of the annual convention of the Canadian Electric Railway Association, which is to be held at the Chateau Laurier, Ottawa, Jan. 31 and Feb. 1, has been made public. The meeting will be called to order at 10 a.m. on Jan. 31 when the president will address the meeting and association business will be discussed. On the afternoon of Jan. 31 the following papers will be read:

"Practical Operation of a Service-at-Cost Contract," by J. E. Hutcheson, manager of the Montreal Tramways.

"The Safety Car," by J. C. McCune, Safety Car Devices Company, New York.

"Adaptability of the Safety Car to Canadian Snowy Climate," by H. E. Weyman, manager of the Levis County Railway.

On Feb. 1, prior to an address by H. B. Morley, general manager of the Ontario Safety League, the following papers will be read:

"Publicity," by A. W. McLimont, vice-president and general manager of the Winnipeg Electric Company.

"Accident Prevention Everybody's Business," by R. Mayne Reid, superintendent of the Quebec Railway.

The meeting will be concluded with the election of officers.

Financial and Corporate

Steps Toward Reorganization

Representatives of Holders of Securities of Rhode Island Company Proceeding With Plans

The first real step looking to the reorganization of the electric railways in Rhode Island which remain as a part of the old Rhode Island Company system was taken during the week ended Jan. 22 when the United Electric Railways came into actual existence.

This corporation was created by act of the Rhode Island General Assembly nearly two years ago to take over the properties operated by the Rhode Island Company. The incorporators were former Governor R. Livingston Beeckman, Bank Commissioner George H. Newhall and Zenas W. Bliss, one of the three receivers of the Rhode Island Company. Acting for his associates, Mr. Bliss has paid into the State Treasury the free required under the act and has received the charter. The incorporators plan within a few days to organize the new company.

$1,000,000 OF NEW CAPITAL

The decision to take out the charter was reached at a meeting of the joint reorganization committee, composed of Samuel P. Colt, Stephen O. Melcalf and Michael F. Dooley. At this meeting the agreement and plans of reorganization were passed upon by the representatives of the three protective committees representing the various groups of holders of the securities of the underlying properties of the Rhode Island Company. Provision for raising the $1,000,000 of new capital required under the reorganization is understood to have been made.

Following the organization of the new company, copies of plans and the agreement will be sent to the individual security holders who will be granted thirty days in which to examine and return them with their approval or disapproval.

The United Electric Railways, under its charter, is authorized to issue a capital stock of $22,000,000 with which to acquire the properties.

There was introduced in the Legislature on Jan. 20 an act amending the charter of the United Electric Railways so as to relieve it from any and all state and city franchise tax payments of the companies that it may acquire.

Taxes of this character amounting to more than $750,000 have accrued and are now owed by the Rhode Island Company to the city of Providence and the state and city franchise tax payments act was passed designed to relieve the new company from assuming any of these obligations. Certain ambiguities in this act, however, have raised a doubt as to whether the object sought has been accomplished. In order that there may be no question about the matter in the future the recent act is presented to clarify the previous enactments of the Legislature.

The United Electric Railways on Jan. 25 organized temporarily to advance the reorganization. Officers were elected as follows: President, Zenas W. Bliss; secretary and treasurer, George H. Newhall; directors, Preston H. Gardner, J. Cunliff Bullock, Francis F. Bales, George H. Newhall and Zenas W. Bliss. Permanent organization of the corporation will probably be brought about at a meeting to be held in February. The personnel of the permanent organization will be decided at conferences with committees of security holders.

At the meeting on Jan. 25 the charter of the new corporation was accepted and $5,000 of stock was subscribed. These steps were necessary before the incorporators could have the status of stockholders and proceed with the temporary organization.

Receivers Named for Ohio Electric Railway

B. J. Jones, Columbus, former general manager of the Ohio Electric Railway, Lima, Ohio, was appointed receiver for that company on Jan. 25 by Federal Judge John M. Killits. His bond was fixed at $50,000. At the same time Henry C. Paul, Fort Wayne, Ind., was appointed receiver for the Fort Wayne division and J. Harvey McClure, Lima, was made receiver for the Indiana, Columbus & Eastern Railroad. Messrs. Paul and McClure, however, will work under the direction of Mr. Jones.

The appointment of the receivers was the first step in foreclosure proceeding begun by the Fidelity Trust Company, Philadelphia, Pa., representing the holders of bonds secured by mortgages on all the properties. Three semi-annual interest payments on the bonds are in default. Other subsidiary companies affected are the light and power plants at Lima and railroad lines to Defiance and from Lima to Toledo.

Paul C. Martin, Springfield, general counsel for the railroad, said that no changes in the organization are planned at this time. The operation of the lines will continue as heretofore. Mr. Martin said the need for the appointment of receivers arose because of "inability to obtain increased passenger rates, added expense due to war prices and the development of the automobile."

Seven-Cent Fare Increasing P. R. T. Income

The 7-cent fare in Philadelphia is having a noticeable effect upon the net income of the Philadelphia (Pa.) Rapid Transit Company, as shown by its December statement. In December, 1919, the company showed a net income of $33,127, which in one year's time was increased to $427,494. After deducting $125,000 for a 5 per cent return on Philadelphia Rapid Transit stock a surplus remains of $302,494. An evidence of what the 7-cent fare is doing for the financial condition is seen in the net income for the year just ended, amounting to $382,065, and for one month amounting to $427,494. However, more than 2,000,000 fewer revenue pasengers were carried during December, 1920, than in the same month of 1919.

STATEMENT OF EARNINGS OF PHILADELPHIA RAPID TRANSIT COMPANY

Month Ended Dec. 31, 1920	1920	1919	Percentage Change Over 1919
Operating revenue	$3,889,911	$3,141,534	23.8
Operation and taxes	2,696,979	2,493,810	8.2
Operating income	$1,192,932	$647,723	84.3
Non-operating income	61,740	197,706	—68.8
Gross income	$1,254,672	$845,430	48.4
Fixed charges	827,177	$812,302	1.8
Net income	$427,494	$33,127	1,190.0
5 per cent return on P. R. T. paid in capital—one month	125,000		
Surplus	$302,494		

Year ended Dec. 31, 1920	1920	1919	Percentage Change Over 1919
Operating revenue	$38,807,354	$35,358,471	9.8
Operation and taxes	29,195,165	24,587,991	18.8
Operating income	$9,612,188	$10,770,480	—10.8
Non-operating income	592,986	681,048	—12.9
Gross income	$10,205,175	$11,451,528	—10.9
Fixed charges	9,823,110	9,735,651	0.9
Net income	$382,065	$1,715,876	—77.9
5 per cent return on P. R. T. paid in capital—year	1,500,000		
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock	$1,117,934		

COMMENT.—Deferred wages formerly shown as an adjustment to net income are now included in the income account for the year ended Dec. 31, 1920. This deferred wage, amounting in total to $949,766, has been made possible of payment to the men as at Feb. 1, 1921, through arrangements with Messrs. Drexel & Company, the company's bankers.

Ten Cents Permanent Chicago Fare

$86,250,000 Fixed as Value of Chicago Elevated Lines—7.5 per Cent Return Allowed—Estimated Earnings for 1921 Only 4.23 per Cent

In an order made a few days before they retired from office, the Illinois Public Utilities Commissioners entered a permanent order as to the value of the elevated railway properties in Chicago, for rate-making purposes, and the rate of fare, in a case which originated before the commission on Sept. 2, 1918. The commission fixed the fare at 10 cents. As of Jan. 4, 1921, it found the value of the properties for rate-making purposes to be $86,250,000.

THE commission found the original cost of the used and useful property of the four elevated companies to be $71,500,000; the original cost less accrued depreciation, $60,775,000; the cost of reproduction new, $95,000,000; the cost of reproduction new less accrued depreciation, $80,750,000; the amount of the element of going value, $6,000,000, and cash working capital and materials and supplies, $1,000,000. After considering all of these elements of the value of the properties of the Metropolitan West Side Elevated Railway, the Northwestern Elevated Railroad, the South Side Elevated Railroad and the Chicago & Oak Park Elevated Railroad, the commission, as previously stated reached the opinion and found that the fair rate-making value of these properties combined is $86,250,000, as of the date of the order, Jan. 4, 1921.

STATISTICS OF SECURITIES CHICAGO ELEVATED RAILWAYS

(As of Dec. 31, 1919.)

Security	Total	Annual Interest
Stocks—		
Preferred	$13,651,900	....
Common	32,545,646	....
Total	$46,197,546	....
Bonds—		
1st mortgage—1938	$10,000,000	$400,000
Extension—1938	5,000,000	200,000
1st motrgage—1936	453,000	22,650
1st mortgage—1941	12,500,000	625,000
1st mortgage—1941	12,500,000	....
1st mortgage—1945	4,472,000	223,600
1st mortgage—1924	8,000,000	360,000
1st mortgage—1928	4,432,000	221,600
Income	987,000	49,350
Scrip	12,500	625
Total	$58,356,500	$2,102,825
Notes—		
Joint equipment	$1,985,000	$99,250
Car	172,000	9,920
Receiver certificate	1,645,000	98,700
Mortgage	6,863	347
Borrowed	154,000	7,700
Chicago Elevated Railways	4,060,763	212,232
N. W. E. R. R.	482,402	24,120
Central Union Telegraph Company	132,975	6,648
	$8,639,003	$458,917
Grand total	$113,193,049	$2,561,742

As in the permanent order covering the case of the Chicago Surface Lines, the commission specified that the elevated lines should be entitled to a return of 7.5 per cent upon the above value. The rate of fare established by the commission as permanent will not, however, earn this surplus by a considerable amount, according to its own computations.

On July 31, 1920, the commission ordered the rate of fare to be placed at 10 cents cash with four tickets for 35 cents. In this permanent order, as of Jan. 4, 1921, the commission stated that these same rates should be continued in effect. At these rates, the commission estimates that the companies will earn during the year 1921, including revenues from sources other than transportation of passengers, approximately $18,400,000. The estimate of the total operating expenses is $14,285,000, including an allowance of $468,000 fixed in this order for depreciation. Deducting these expenses, $3,647,000 remains to provide for return upon the investment. This is only 4.23 per cent on the established valuation of the properties.

In justifying these rates of fare, the commission took into consideration the downward trend of prices. It also calls attention to the competitive situation existing between the elevated and surface lines. In 1919, there were 13,000,000 fewer revenue passengers on the elevated than in 1918, when the fare was 5 cents, and in 1920 about 7,000,000 fewer passengers were carried than in 1918. The commission then says that "when it is considered that for all except a small part of their business, the elevated lines must actively compete with the Chicago Surface Lines, steam railroads and other transportation agencies, it seems plain that a differential greater than that now in effect would cause a substantial loss of business." The differential referred to as now existing is 0.75 cents, if tickets are purchased on the elevated and 2 cents where a cash fare is paid, the fare on the Chicago Surface Lines being 8 cents flat.

The commission also makes note that the operating expenses of the companies were approximately $7,616,000 greater in 1920 than in 1916, while the revenues were about $8,534,000 greater. Hence, under the rates now in force, the companies have increased their net earnings about $918,000 over 1916. This, the commission says, compares favorably with the average results for the five years from 1913 to 1917, inclusive, wherein the companies had a net return on the average $1,140,255 less than is estimated will accrue to them in the year 1921 under the rate authorized.

In the report is included the accompanying summary of the outstanding obligations of the elevated companies. From this it is seen that the total outstanding securities amount to $113,193,049 and the total bonded and floating indebtedness $66,995,503. The estimated surplus of $3,647,000 for 1921 will thus provide an average interest earning of 5.4 per cent on the funded debt, as it existed as of Dec. 31, 1919.

In the accompanying table of the consolidated income statement of the four elevated railways, there is shown the average fare received during each of the several years covered in the statement. Throughout the period of

CONSOLIDATED INCOME STATEMENT CHICAGO ELEVATED RAILWAYS

(Year Ended Dec. 31.)

Item	1913	1914	1915	1916	1917	1918	1919	1920*
Revenue passengers	164,164,225	165,770,161	164,673,516	180,654,632	193,120,173	197,440,107	184,663,025	190,630,210
Average fare	5.152c	5.164c	5.161c	5.156c	5.155c	5.285c	6.976c	8.388c
Revenues:								
Passenger	$8,459,940	$8,560,492	$8,499,170	$9,314,348	$9,970,869	$10,434,815	$12,881,311	$15,990,702
Other transportation	467,373	444,822	432,414	453,774	484,859	521,396	602,247	754,250
Non-operating	250,042	97,367	37,506	97,965	84,911	74,451	82,831	100,221
	$9,177,355	$9,102,681	$8,969,090	$9,865,987	$10,540,639	$11,030,662	$13,566,389	$16,845,173
Expenses:								
Way and structures	$235,701	$230,073	$230,883	$290,221	$341,179	$497,923	$1,036,480	$1,736,382
Equipment	293,490	353,638	473,180	537,481	641,989	724,323	1,032,497	1,401,621
Power	1,147,904	1,130,617	1,111,693	1,240,144	1,370,908	1,297,969	1,376,159	1,491,123
Conducting transportation and traffic	2,400,481	2,514,811	2,553,767	2,783,447	3,055,827	3,748,681	5,117,296	6,991,518
General and miscellaneous	343,214	363,000	339,710	348,896	450,425	416,535	730,002	788,879
	$4,420,790	$4,592,139	$4,709,233	$5,200,189	$5,860,328	$6,685,431	$9,292,434	$12,409,523
Operating Expenses:								
Taxes, car licenses, etc	$787,537	$781,082	784,690	$876,211	$971,130	$1,079,323	$908,057	$1,089,376
Rentals	233,705	271,350	253,551	289,862	314,174	294,347	342,673	363,870
Total	$5,442,032	$5,644,571	$5,747,474	$6,366,262	$7,145,632	$8,059,101	$10,543,164	$13,862,769
Available for depreciation and return on investment	$3,735,323	$3,458,110	$3,221,616	$3,499,725	$3,395,007	$2,971,561	$3,023,225	$2,982,404
Rehabilitation not included in above figures	$696,339	$704,102	$404,077	$302,616	$328,919	$71,222	....	......
Available for depreciation and return on investment after deducting rehabilitation	$3,038,984	$2,754,008	$2,817,539	$3,197,109	$3,066,088	$2,900,339	$3,023,225	$2,982,404
Note A—The above statement excludes following amounts of replacement reserve							$195,339	$781,357

* First eleven months actual results; estimated for December.

SUMMARY OF APPRAISALS, CHICAGO ELEVATED RAILWAYS

Submitted By	Appraisal	Basis	Cost—New	Cost—New Less Depreciation
Company	June 30, 1919	Reproduction; prices as of the first six months of 1919: Owned lines	$133,958,284	$115,879,643
Company	June 30, 1919	Reproduction; prices average 1916-1920, inclusive: Owned lines	$133,170,108	$114,989,053
Company	June 30, 1919	Reproduction; prices average 1913-1919, inclusive: Owned lines	$112,887,664	$98,337,464
Company	June 30, 1919	Reproduction; prices average 1906-1915, inclusive: Owned lines	$95,676,254	$84,463,620
City	June 30, 1919	Reproduction; prices as of the first six months of 1919: Owned lines	$91,470,852	$74,946,882
Arthur Young & Company—		Book costs to June 30, 1919		$91,732,724
Commission Chief Accountant:		Book costs to Dec. 31, 1919		* $84,790,677

* Includes purchase price of Union Elevated Railroad (Union Loop) $10,916,000; actual cost of construction (Commission Exhibit 8), was $4,408,854.

Note A.—The cost of reproduction of physical property as above set forth embodies, for prices as of the first six months of 1919, all changes in specific accounts together with changes in overheads to conform. Costs of reproduction on price bases as of 1916 to 1920, 1913 to 1919, 1906 to 1915, embody only changes in specific accounts, the overheads not having been recomputed. The recomputation of overheads would tend to increase the figures in these three cases slightly.

Note B—Above appraisals do not include the following amounts for working capital and development cost.

Prices as of	1st 6 mos, 1919	1916–1920	1913–1919	1906–1915	Book Cost
For working capital	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000
For development cost	12,460,000	11,800,000	11,800,000	11,800,000	11,801,754
Total	$14,460,000	$13,800,000	$13,800,000	$13,800,000	$13,801,754

the three years ended June 30, 1916, 1917 and 1918 the 5-cent flat fare was collected by the company and the higher than 5-cent average fare is accounted for by the second fare paid by Evanston passengers. A straight 6-cent fare became effective Nov. 22, 1918, and in the nine months ended July 31, 1919, the average fare collected thereunder was 6.113 cents. A straight 8-cent fare became effective on Aug. 8, 1919, and during the six months ended Jan. 31, 1920, the average fare received thereunder was 8.110 cents. An 8-cent cash fare with two tickets for 15 cents, which became effective Feb. 1, 1920, resulted in an average fare during the six months ended July 31, 1920, of 7.745 cents. The 10-cent cash fare with four tickets for 35 cents, which became effective Aug. 4, 1920, resulted in an average fare during September, October and November, 1920, of 9.267 cents. The average fare shown in the table referred to is, of course, the average for the year, which in some cases involves a change in the rate.

In establishing $468,000 as the amount that would be allowed annually to provide for the depreciation accruing in the properties which is not cared for in operating expenses, the commission accepted the per centage rates of depreciation determined by the company and shown in an accompanying table, but the commission applied these rates to the original costs of the various classes of property instead of to the cost-of-reproduction new figures used by the company and appearing in this table. On the basis of computation used by the companies, the annual amount necessary was $883,393, as against $468,000 allowed by the commission, including $14,600 for depreciation on leased lines which the companies are obliged to maintain under their contracts.

In presenting its case to the commission, the Chicago Elevated Railways submitted reproduction cost values and the book value of the properties. The city submitted one valuation and the chief accountant of the commission submitted a separate estimate of the book costs. These appear in an accompanying tabulation, from which it is seen that the valuation of $86,250,000 allowed by the commission as of Jan. 4, 1921, is among the lowest figures submitted.

CHICAGO ELEVATED RAILWAYS — ESTIMATED ANNUAL RESERVE REQUIRED FOR REPLACEMENTS EXCLUSIVE OF THOSE CARED FOR BY MAINTENANCE CHARGES AND REFLECTED IN OPERATING EXPENSES, IN ACCORDANCE WITH ACCOUNTING PRACTICE OF COMPANIES, OWNED LINES ONLY

Item	Cost New of Reproduction	Annual Depreciation Per Cent	Annual Depreciation Amount
Way and structures:			
Engineering and superintendence	$2,761,436	0.55	$15,188
Paving	384,330	2.50	9,608
Elevated structures and foundations	25,022,032	0.71	177,656
Bridges, trestles and culverts	1,451,873	0.81	11,760
Signals and inter. apparatus	947,905	3.33	31,565
Telephone and telegraph lines	127,679	6.13	7,827
Poles and fixtures	80,711	3.33	2,688
Underground conduits	128,319	1.05	1,347
Shops and car houses	1,148,068	1.01	11,595
Stations, miscellaneous buildings	4,980,220	1.05	52,292
Total	$37,032,573	0.87	$321,526
Equipment:			
Passenger and combination cars	$17,447,529	1.58	$275,671
Service equipment	154,709	1.55	2,398
Electrical equipment of cars	6,577,687	1.50	98,665
Shop equipment	264,026	4.00	10,561
Furniture	108,076	2.00	2,162
Miscellaneous equipment	3,923	10.00	392
Total	$24,555,950	1.59	$389,849
Power:			
Power plant buildings	$2,987,422	1.00	$29,874
Sub-station buildings	391,056	1.00	3,924
Power plant equipment	4,491,708	2.33	104,657
Substation equipment	1,046,347	3.20	33,483
Transmission system	2,792	2.88	80
	$8,919,325	1.93	$172,018
Total	$70,507,848	1.25	$883,393

Financial News Notes

Discontinuance of Line Authorized.—In the Superior Court at Westerly, R. I., recently Judge Chester W. Barrows granted the petition of Robert W. Perkins, ancillary receiver of the Shore Line Electric Railway, Norwich, Conn., for leave to discontinue service on the lines operated from Westerly to Watch Hill, Pleasant View and Ashaway. The receiver testified that the lines were operated during the past year at a substantial loss. After hearing the testimony Judge Barrows granted the petition and the receiver in his discretion may discontinue the operation of these lines.

Adrian Road Being Operated Independently.—The annual meeting of the stockholders of the Adrian (Mich.) Street Railway resulted in the divorcing of the control of the property from the Toledo & Western Railroad, which has lately gone into hands of receivers. Frank R. Coates was elected president, Morton Seeley, vice-president, A. C. Van Driesen, treasurer and Henry Ledbetter, secretary. These men are also directors. Steps to place the Adrian system on a more efficient basis were also taken. The system is the terminal for the Toledo & Western line and has been operated by the Doherty interests for a number of years. It is barely paying its way and is for sale. Recently the city was considering buying the lines.

Ownership of Road Established.—The suit instituted in New York by Harry K. Johnson, organizer and first president of the Orleans-Kenner Electric Railway, New Orleans, La., to decide the ownership of the road has been settled out of court, according to advice received by Mr. Johnson at New Orleans. This announcement was made on a recent visit to Paul Maloney, Commissioner of Public Utilities, for the purpose of staying action of the Commission Council to remove the spur track of the Orleans-Kenner road at its present terminus in South Rampart Unit, near Coral. Mr. Johnson promised to provide the road with another terminal inside of sixty days after he obtained possession of the railway. The Orleans-Kenner road operates between New Orleans, in Orleans Parish, and Kenner, in Jefferson Parish.

Traffic and Transportation

Consent Unanimous

All Factions in Boulder, Col., Back Railway's Petition for Rate Increase—New Fare 10 cents

A spirit of co-operation between city and railway marked an increase in fare in Boulder, Col., on Jan. 7. The city authorities after a thorough investigation of the local traction situation authorized the Western Light & Power Company to raise the fare from 5 cents to 10 cents for adults and from 3 cents to 5 cents for children. In so doing they took occasion to commend the railway for the quality of service furnished on its Boulder lines.

BUSINESSLIKE PROCEDURE

The city of Boulder in under the city manager form of government. It is one of the six home-rule cities of Colorado, which, by a recent decision of the State Supreme Court, have jurisdiction over rates charged by the public utilities operating within their limits. Scott Mitchell, the City Manager, is a civil engineer by profession, and before taking his present position engaged in engineering work for a number of years.

The railway petitioned the Mayor and the City Council to be allowed to raise its rate. It submitted a valuation of its railway property, the revenues of the same, and the cost of operation for a period of five years, showing a considerable loss from the operation of the railway department. The valuation was referred to City Manager Mitchell. After a close examination of the data, Mr. Mitchell approved the valuation and report as submitted and recommended to the Mayor and the City Council that the higher fare be granted. Mr. Mitchell also commended the company for the excellent manner in which it presented its case.

At a meeting of the Council early last December the petition was read and an ordinance initiated by the city attorney granting the fare sought by the company and repealing the nickel rate then in effect. The ordinance was passed unanimously and according to law was published for ten days in the newspapers to give time to any person who wished to protest against the proposed increase. No protests being made, the Council at its next meeting gave its final approval to the fare increase.

NEWSPAPERS BACK RAILWAY

The ordinance was then published for thirty days, according to law, so that any persons who wished to initiate a referendum might do so. This time passed without anyone protesting or preparing a referendum petition, and at the end of the thirty days, on Jan. 7, the measure took effect. At the time of the final passage by the City Council a similar petition for increase in fare was filed by the company with the Public Utilities Commission of Colorado, which gave its approval of the increase as a matter of course.

The two Boulder daily newspapers indorsed the increase in rates editorially, and also asked the people to patronize the railway under the new schedule. The newspapers also requested automobile owners not to pick up potential railway riders and carry them free of charge. Editorials in the dailies pointed out that the community could not expect the railway to continue operating if it did not receive a fair return on its investment.

In asking higher fares the railway showed that there was a pleasure automobile to every six inhabitants of the city and that as the streets were always good for travel by the automobiles there was not so much necessity for the operation of the railway as there had been previous to the coming of motor transportation. It pointed out that the great increase in the number of automobiles had made serious inroads upon its revenue. The electric light and power and the railway franchises are combined, but the company explained that it considered it unfair to have the users of electric light and power bear the burdens of the deficit in the railway department.

Eight-Cent Fare Denied in Raleigh

An application of the Carolina Power & Light Company, Raleigh, N. C., for permission to charge an 8-cent cash fare with four tickets for 30 cents on the Raleigh city lines, has been dismissed by the North Carolina Corporation Commission. The commission points out that the tendency of operating costs is now downward and that it does not deem it wise at this time to grant the increased rate demanded. The commission directs the company to furnish to the Mayor of Raleigh on the first day of February, March, April and May of this year a detailed statement of operating revenues and costs and orders the city of Raleigh to show cause on May 3 next, before the Corporation Commission why an order increasing the present rate should not be made. At present the fare is 7 cents with four tickets for 25 cents.

The commission's order reads in part:

> It appears to the commission that the petitioner is not now receiving a sufficient income from passenger fares to provide a reasonable profit on the investment made and that even at a rate of 8 cents it could not earn at the present cost of operation, over 3 per cent. However, our commission is bound to take judicial notice of the fact that the tendency of operating costs is downward, and it does not deem it wise at this time to grant the increased rate demanded.

Weekly Pass in Kenosha

Success of Racine Experiment Prompts Extension of Idea of Unlimited Weekly Rides for $1

The Wisconsin Gas & Electric Company, operating the local railway in Kenosha, Wis., announced that beginning Jan. 20, 1921, its patrons would be able to buy a transferable "weekly pass" for $1. The pass will be good for an unlimited number of rides during the seven days beginning each Monday. Only one person will be permitted to use the pass at a time. The cash fare on the Kenosha lines is 7 cents, with four rides for 25 cents. These rates took effect Oct. 30 last.

BIG AID TO CAR OPERATORS

A passenger upon boarding a car will merely show the pass to the conductor and proceed inside. This will eliminate the necessity of making change or the giving of transfers. Incidentally it is expected that the use of the pass will help speed up the service. Kenosha is an industrial city of some 40,000 population. The base service is now being rendered by one-man cars. The passes will be on sale by the conductors or at the headquarters of the railway in the Public Service Building. They will be of pasteboard, of the usual pass size and form, will be dated and numbered and will bear appropriate wording.

Kenosha is the second city in the United States to have the "weekly pass." The plan was originally introduced in August, 1919, in Racine, Wis., by the Milwaukee Electric Railway & Light Company, which operates the railway in Racine. It proved a big success and the Racine City Council has urged that it be continued there permanently. The Wisconsin Gas & Electric Company and the Milwaukee Electric Railway & Light Company are both subsidiaries of the North American Company.

"EVERYBODY'S RIDIN'"

In its announcement introducing the "weekly pass," the Wisconsin Gas & Electric Company points out that the use of the passes will save the public time and money in that it will enable people to use the street cars for all traveling about the city without extra expense. The announcement by the company, in pointing out the advantages of the scheme, says:

> The theory of the Weekly $ Pass is that the regular customers of the car lines should be entitled to lower rates than others.
>
> No one who lives in Kenosha needs to pay a 7-cent fare. If you ride only eight times a year you can buy eight tickets for 50 cents. If you or members of your family ride every day the Weekly $ Pass will give you the cheapest possible fare and unlimited use of the cars.
>
> You will soon get the habit of using your pass to ride two or three blocks. When it is raining, cold, slushy or snowing—what a boon the Weekly $ Pass is then. Your family will get more than $1 worth of rides on weekdays. Your extra daily rides and your evening and Sunday trips are really free. There will be no need to stay downtown for lunch. With the Weekly $ Pass in your possession it will be cheaper to go home than to eat downtown. If you are not using your pass loan it to a friend. It is transferable.

Dime Fare Refused as Prices Fall

New York Commission Holds 10-Cent Rate Unjustified in Albany, but Allows 8-Cent Fare—No Increase in Troy

Basing its stand on the assumption that the peak of operating costs has been passed and that expenditures for wages and maintenance and supplies will recede on the average 15 per cent during the present year, the Public Service Commission for the Second District on Jan. 21 refused to allow the United Traction Company, Albany, N. Y., to raise the fare on its lines in Albany from 7 cents to 10 cents. An 8-cent cash fare with four tickets or tokens for 30 cents was authorized for the Albany lines. The commission denied the application for an increase in the Troy zone, where a 7-cent fare is now charged, and fixed 5 cents as the rate for local rides in the city of Rensselaer and 6 cents for rides between that city and the Plaza in Albany. The new rates take effect Jan. 29.

THE commission discusses the prospective decline in operating costs as follows:

> It appears that wages have increased enormously during the war reconstruction period. We do not believe the commission can assume that the present scale is to continue. It is evident the company is unwilling to continue it under the present rates of fare, and the existing agreement seems to assume that unless the fares are increased the present scale will not continue. The rate increases granted by the commission in 1918 and 1920 have been more than absorbed by the increased wage scales. In substance, therefore, the commission in the last two rate orders as well as in the order about to be made has been and is dealing not with return on the company's investment but with wages of the employees.
>
> It is a matter of general knowledge, of which the commission may properly take notice, that the costs of both labor and materials, which have so sharply advanced within a brief period, have begun to decline. The apex seems clearly to have been passed. In view of this condition and of the terms of the last wage agreement of this company we do not *feel* justified *in* fixing rates upon the assumption that the present wage scale of the company will continue any considerable time. It may be that wages will not decline as rapidly as they have advanced, but it seems clear that they cannot remain at the present point when the general cost list is receding.
>
> The same may be said of operating and material costs in general. It is a serious proposition to increase rates of fare in the face of declining costs of other commodities. It may be asserted that the subjects adverted to are for the consideration only of the directors of the corporation and that the sole province of the commission is to award a rate which will pay a reasonable return on investment based on proven costs. We think, however, that this is too narrow a view. The commission's powers are not exclusively judicial. They are also administrative and quasi-legislative. They must needs be administered with these truths in view by reason of the extremely practical problems which are presented to it for determination. Under the circumstances we think we must assume, in arriving at an estimate of expense for the coming year, that the trend of wages and other expenses will be downward.

REASONS FOR 8-CENT FARE

The commission's opinion, after citing estimates of operating expenses, says:

> Assuming these computations to be correct and that the commission's estimate of operating expenses on the average during the period covered by the order to be made is justified, no increase in the Albany zone should be made.
>
> The result arrived at, however, is deduced from many estimates and allocations and the tracks in the town of Colonie have been treated as incidental to the Albany property. It is realized also that the treatment of the Rensselaer traffic ignores the part of the traffic west of the Albany Plaza. Furthermore, the commission need not limit the rate of return 8 per cent.
>
> An increase in the cash fare in the Albany zone, including passengers between Albany and Rensselaer who travel in either direction west of the Plaza in Albany, from 7 cents to 8 cents, with the option to the rider of purchasing from conductors on the cars four tickets for 30 cents will yield the company somewhat over 7½ cents per passenger. Assuming a slight falling off in traffic this increase will amount to, say, $120,000. This seems a reasonable solution of the problem in the Albany zone.

The refusal of the commission to grant any increase for Troy and Rensselaer was based on franchise agreements which these cities have with the company, limiting the fare to 5 cents. The city of Troy had agreed to increase the fare to 6 cents and later to 7 cents, but the Common Council refused to agree to any further advance. The city of Rensselaer agreed to a 7-cent fare for a period expiring this month. The commission therefore ordered a reduction to 5 cents within the limits of the latter city and to 6 cents in the Rensselaer-Albany zone.

In applying for relief the company stated that for the first eight months of the year 1920 its revenues and expenses, exclusive of the operation of the Hudson Valley Railway, were as follows: Railway operating revenues, $2,129,729; expenses and taxes, $2,111,072; operating income, $18,657. A substantial wage increase took effect on July 1 last, so that from that time forward the showing was even worse. The company's estimate for the last four months of 1920 indicated an operating deficit of $128,721, or a total deficit for the year of $11,064. None of these figures include charges for interest or return on investment.

Worcester's Need Urgent

The Massachusetts Department of Public Utilities on Jan. 20 heard arguments on the application of the Worcester Consolidated Street Railway for a straight 10-cent fare with free transfers, instead of the present 7-cent zone system, on its Worcester city lines. The company also asks an increase on its suburban lines from 6 cents to 7 cents in each zone. Bentley W. Warren, counsel for the railway, opposed the continuation of the zone principle in Worcester. Mr. Warren said:

> In Worcester we have tried the five-and-five-cent fare, the six-and-six, and finally the seven-and-seven-cent fare now in operation, and none of them has produced the money necessary to operate the road and keep it up in repair as any road should be kept up. * * *
>
> So far the Worcester Consolidated has hardly been able to exist, its problem having been an endeavor to keep up with the band wagon which has been driven by its employees.
>
> I do not maintain that the increased fare we ask is due entirely to the added burdens which have been placed upon us by reason of the constantly increased wages which have been granted, but that item has been a big factor. Another increase in wages goes into effect in July and the road simply must have the revenue to meet its running expenses or it must be given up. * * *
>
> It is not a question of continuing the present seven-cent fare but rather a question of increasing the annual operating revenue by at least 500,000.
>
> The last dividend paid by the road was in 1917 and since that time it has been receiving barely enough revenue to enable it to meet its interest and tax bills.

Mr. Warren stated it is estimated the passenger revenue would be increased under the new fare schedule $769,876 during the next twelve months. Referring again to the wage question he stated the pay roll for 1921 based on the same amounts for operation as last year, will exceed $2,600,000. An increase of more than $219,000 over last year is due to the increase in wages.

Louisville Increase Again Refused

The City Council of Louisville, Ky., on Jan. 25 rejected by a vote of 18 to 2 an ordinance granting the Louisville Railway an increase in fare from 5 cents to 7 cents. The Council took this action regardless of the fact that the Board of Alderman had previously passed the measure. The defeat of the higher fare proposition followed closely the reading of a protest from the local carpenters' union against increasing the rate. This protest stated that the carpenters of Louisville had decided not to ask for an increase in wages and quoted a statement of the Employers' Association of Louisville relative to a general decline in commodity prices.

This protest was greeted by the spectators at the Council meeting with vigorous applause. When the ordinance came up the Council was in no mood to consider it favorably. Officials of the Louisville Railway stated on Jan. 26 that their next move had not been decided upon but would probably be announced in a day or so. It is improbable that any further effort will be made at this time to get another ordinance through the Council. One official of the company declared recently that if the ordinance failed of passage service would undoubtedly be curtailed, since it would be utterly impossible to continue to furnish the present service at a nickel fare.

Dime Fare Made Permanent

The Illinois Public Utilities Commission has issued an order making permanent a fare advance to 10 cents on the lines of the Chicago Elevated Railways with the continuation of the sale of four tickets for 35 cents.

The order disclosed a fixed valuation for the company's property of $86,250,000, which contrasts with a total funded and floating debt of $66,732,500. The commission estimates the earnings on that property valuation as $3,647,000, or 4.23 per cent, although it admitted that the percentage return ought to be as high as 7½ per cent. The commission's findings are discussed at greater length on page 241 of this issue.

Transportation News Notes

Dime Fare in St. John.—The New Brunswick Power Company, St. John, N. B., on Jan. 3 raised the cash fare on its St. John lines from 6 to 10 cents. Three tickets are sold for 25 cents.

Tokens in Wilmington.—Metal tokens have replaced strip tickets on the lines of the Wilmington & Philadelphia Traction Company, Wilmington, Del. The outstanding paper tickets will be redeemed at the company's office.

Six Cents in Newark.—The City Council of Newark, Ohio, has passed an ordinance authorizing the Ohio Electric Railway, Springfield, to charge a 6-cent fare on its Newark lines. The new rate is to continue until Jan. 1, 1922. The fare has been 5 cents.

Eight Cents in Las Vegas.—The Las Vegas (N. M.) Transit Company on Jan. 1 raised its fare from 6 cents to 8 cents. The increase was authorized by the State Corporation Commission. The company in requesting an increase showed that it had been operating at a considerable financial loss.

Six Cents in Decatur.—The Decatur Railway & Light Company, Decatur, Ill., has been authorized by the State Public Utilities Commission to charge a 6-cent fare on its Decatur lines. The fare has been 5 cents. The city authorities have announced their intention to appeal to the courts from the commission's rate ruling.

Ten Cents in Ardmore.—The Oklahoma Corporation Commission has authorized the Ardmore Railway to raise its cash fare within the Ardmore city limits to 10 cents. Testimony at hearings before the commission showed that the company was losing between $100 and $400 a month. The new rate is to take effect at once.

Seven Cents in La Crosse.—The Wisconsin Railway, Light & Power Company, La Crosse, Wis., has raised the fare from 6 cents to 7 cents on its La Crosse lines under authority of an order issued by the Wisconsin Railroad Commission. The company has raised the price of monthly ticket books good for fifty rides from $2.75 to $3.

No Increase in Wichita Falls.—The City Council of Wichita Falls, Texas, has refused to grant a petition of the Wichita Falls Traction Company for a 7-cent fare. The railway raised its fare last October from 5 cents to 6 cents. The Council considered a further increase unnecessary in view of recent recessions in the prices of supplies.

Alabama Road Charges Eight Cents.—An order has been issued by the Alabama Public Service Commission permitting the North Alabama Traction Company to increase its fares in Albany and Decatur to 8 cents. A tentative increase was allowed the company some time ago pending the submission of all facts.

Patrons Approve Higher Rate.—The patrons of the Nahant & Lynn Street Railway, Lynn, Mass., have approved an increase of 3 cents in the fare charged by the company. The new rates will be 13 cents for a single trip and 25 cents for a return trip, with nine rides for $1. The company sought a 15-cent rate. The fare has been 10 cents.

Seven Cents in Tulsa.—The Tulsa (Okla.) Street Railway on Jan. 10 raised its cash fare from 5 cents to 7 cents by authority of the State Corporation Commission. Four tickets are sold for 25 cents. The company is directed to take immediate steps to improve its service. The city of Tulsa contests the right of the commission to grant the higher rates.

Hearing of Trenton Case Put Off.—The New Jersey Board of Public Utility Commissioners has indefinitely postponed hearings on the application of the Trenton & Mercer County Traction Corporation, Trenton, for an increase in fare. This step is taken because of the uncertainty regarding the status of the present members of the board. The company is seeking to raise its fare from 7 cents to 10 cents.

Zone Fare Eight Cents.—The Public Service Commission for the Second District on Jan. 18 authorized the Troy & New England Railway, Troy, N. Y., to raise the fare in each of the three zones into which its line is divided from 6 cents to 8 cents. The railway showed a deficit of more than $4,600 in 1920. The company has never paid a dividend and its total deficit now amounts to upward of $32,000.

Three Cents a Mile Asked.—A new rate schedule of 3 cents a mile in the place of the present one of 2½ cents, has been filed with the State Board of Public Utility Commissioners by the Public Service Railroad, Newark, N. J., which operates the "Fast Line" between Newark and Perth Amboy and between Milltown and Trenton, with branches to Chrome, Sewaren and other communities. The road is a subsidiary of the Public Service Corporation.

Seven Cents in Colorado Springs.—Fares on the city and suburban lines of the Colorado Springs & Interurban Railway, Colorado Springs, Col., were raised from 6 cents to 7 cents on Jan. 6 as the result of an order issued by the State Public Utilities Commission. The railway was directed to sell eight tickets for 50 cents instead of nine for 50 cents. The increase in fare was authorized several months ago by the City Council.

Needs More in Mansfield.—The Richland Public Service Company, Mansfield, Ohio, has made application to the local City Council for an increase in fares from 7 cents cash, four tickets for 25 cents to 10 cents cash, four tickets for 35 cents. On the present rate the company is not making expenses. According to a provision of the franchise, if an agreement is not reached between the city and the company within forty-five days, the new rate of fare goes into effect automatically.

Would Charge 10 Cents.—The Choctaw Power & Light Company, which owns and operates the electric railway system in McAlester, Okla., has made application to the Oklahoma Corporation Commission for authority to increase fares from 5 cents to 10 cents. It is claimed in the petition that the 5-cent rate is entirely inadequate and that the company faces curtailment of service or bankruptcy if this fare is imposed. The commission has taken the application under advisement.

Court Sustains Indiana Commission.—The Circuit Court sitting at Hartford City, Ind., has dismissed a suit of the Board of Commissioners of Grant County, Ind., against the Indiana Public Service Commission. The board sought an order to set aside a ruling of the commission fixing rates of the Union Traction Company, Anderson, between Marion and Jonesboro, Ind. The court's ruling followed a decision of the Indiana Supreme Court holding that the commission had authority to abrogate local franchises.

No Sunday Cars in Brantford.—By a vote of 2,725 to 2,534 the ratepayers of Brantford, Ont., have defeated a proposal to have Sunday cars operated on the municipally-owned railway system. Many of the ratepayers opposed the innovation because of the extra expense involved. St. Thomas, Ont., recently voted for Sunday cars. The system is municipally owned but has never been a paying venture. The ratepayers of Peterboro have approved a by-law providing for Sunday operation of the cars of the Peterboro Radial Railway.

Riders Resent Rate Plea.—Patrons of the Poughkeepsie & Wappinger Falls Railway, Poughkeepsie, N. Y., have adopted the slogan, "We Walk," as a protest against the action of the railway in petitioning the Public Service Commission for the Second District for an increase in fare from 7 cents to 10 cents. Under direction of Charles H. Case, Alderman from the First Ward, walking clubs have been organized in every ward in the city, as well as at the other points outside the city served by the company. Buttons bearing the slogan of the clubs have been ordered, and a general strike against the railway is said to be contemplated.

Bill for Five-Cent Fares.—A bill fixing the rate of fare on the railway lines in Milwaukee, Wis., at 5 cents has been introduced in the Wisconsin Legislature by Assemblyman M. M. Higgins. The bill deprives the Wisconsin Railroad Commission of authority to fix rates in Milwaukee. Mayor Daniel V. Hoan of Milwaukee is reported to have commented as follows upon the bill: "The people of Milwaukee can get a 5-cent fare only through municipal ownership of the railway lines and it might not come immediately even in that way, as it would have to depend upon the cost of operating the lines."

Nickel Now in Nelson.—After operating for eight months at a 4-cent fare the Nelson (B. C.) Street Railway has returned to the former nickel rate. The 4-cent fare experiment resulted in an increase in the number of passengers carried of 45,000 over the same period a year ago. The receipts also showed a gain of about $1,000. The City Council has directed a return to the 5-cent fare to see if the traffic will be affected. The railway is municipally owned and operated and serves a community of about 4,500 persons. Mrs. W. G. Foster, a member of the Board of Aldermen, is chairman of the street railway committee, and was the sponsor of the 4-cent fare.

Traffic Survey for the City of Nashville.—The City Commissioners of Nashville, Tenn., have engaged the services of Ross W. Harris as traffic expert to make a survey of the railway conditions of the Nashville Railway & Light Company in accordance with the order of Tennessee Railroad & Public Utilities Commission. The survey will be started at once. The streets in the business district of the city are exceptionally narrow and become very congested during the rush hours. One-way traffic laws are in effect on many streets for railway and vehicular traffic. It is thought that there is some method by which traffic congestion can be avoided or at least mitigated by widening the streets or by rearranging the traffic.

Mayor Vetoes Lima Fare Bill.—Mayor F. A. Burkhardt, of Lima, Ohio, has vetoed an ordinance passed by the City Council on Jan. 3 authorizing the Ohio Electric Railway to continue to charge a 7-cent cash fare within the Lima city limits for a period of six months after Feb. 1. The 7-cent fare took effect on Sept. 1 last. The company has been selling nine tickets for 50 cents. In his veto measure Mayor Burkhardt points out that the temporary franchise granting a six months' extension did not provide for improvement in the service. He urges the Council and the company to get together in working out a permanent franchise, so that improvements in the service will be assured.

Seven Cents Asked in Dallas.—A straight 7-cent fare to become effective immediately and to remain in effect until a new service-at-cost franchise is granted or the accumulated deficit is wiped out, has been asked of the Board of Commissioners of Dallas, Texas, by Richard Meriwether, general manager of the Dallas Railway. If the fare is granted the company makes a commitment to borrow $138,000 from local banks with which to carry out the South Lamar Street track rebuilding and paving project and expresses the belief that the increased fare will re-establish the credit of the company to such an extent that it will be able to secure the loan. The railway is now charging a fare of 6 cents. Mr. Meriwether's letter to the City Commission was published in detail on page 196 of last week's issue.

Court Stays Rate Action.—Judge K. Rockwell recently handed down an order staying all proceedings against the Detroit (Mich.) United Railway by the townships and communities which began a suit to compel return to franchise rates of fare, in spite of increased allowances under the so-called Smith act. The action is on motion by the Detroit United Railway and in accordance with a suggestion of Prosecutor G. C. Gillespie, who informed the court he could in that way take the matter direct to the State Supreme Court or the United States Supreme Court, if the latter step were necessary. The Smith act allows interurban railroads earning less than $8,000 a mile to charge a rate of 2.5 cents a mile. Under the terms of the law the Detroit United some time ago raised the fare on several of its interurban lines to a basis of 2 cents a mile.

Nine Cents in Rock Island.—Fares on the Illinois side of the Mississippi River on lines operated by the Tri-City Railway were increased on Jan. 12 from 8 cents to 9 cents. The new rate affects Rock Island, Moline and East Moline and several adjacent villages. Last July the company applied to the State Public Utilities Commission for an increase from 7 cents to 10 cents. The 8-cent fare was granted temporarily by the commission. After the court decision had allowed the company a nine-cent fare on the Iowa side of the river (Davenport and adjacent towns) a hearing was held by the commission in September. Commutation tickets, giving the passenger a ride from any part of the Illinois territory to any part of the Iowa territory served by the company are now 18 cents, as compared to 16 cents formerly. School children are carried for 4 cents each.

Street Collection in Dallas.—The Dallas (Texas) Railway has stationed fare collectors on the sidewalk near the safety zones in the downtown section of the city. During the morning and evening rush hours the company has additional collectors within the safety zones as a means of further speeding up traffic. The collectors on the sidewalk receive fares and issue receipts which are taken up by the collectors within the safety zones. This practice enables passengers to purchase receipts during off-peak hours and to board the cars without loss of time. Under the former systems the fare collector within the safety zone was sometimes swamped when a number of persons sought to board a car at the same time. The company has placed metal tokens on sale at the inspectors' booths in the downtown business section. The price of each token is 6 cents, the same as the cash fare.

A Splendid Safety Record.—Though rails were slippery and consequently cars *would* bump, the record of the Michigan Railway during its "No Accident Week" will go down in history. With but single exception the railway company was 100 per cent perfect on safety from Jan. 1 to Jan. 7 inclusive. At Battle Creek the fatal accident occurred—fatal in the sense that a record was marred though no life was lost. The powers that be proclaim that bumping cars constitute a serious mishap. But if rails are slippery who is to blame? The vice-president and general manager of the company doesn't blame anyone at all, but has sent a letter to local employees in Jackson in which he extends the management's appreciation to all employees and the public in general who co-operated in the accident prevention campaign, and expresses the hope that this campaign has been the means of bringing caution more emphatically to the attention of the public.

Six Cents in Charleston.—The Charleston-Dunbar Traction Company, Charleston, W. Va., has been authorized by the West Virginia Public Service Commission to raise its fare within the Charleston city limits and between Charleston and Dunbar. Increases in operating expenses and taxes were among the reasons cited by the commission in granting the higher rates. It was stated that the railway's operating costs had been increased $7,200 a year by a wage increase allowed employees last July. The company declared that it would require an income of $7,500 a year greater than in 1920. The new rates, which will remain in effect until Jan. 1, 1922, are as follows: In the city of Charleston, 6 cents; between the city limits and Lock Six, 6 cents; between Lock Six and Dunbar, 6 cents; between Charleston and Dunbar, 18 cents; nine tickets in strip for 50 cents; commutation tickets, 14 cents each in strips of ten or multiples thereof, good between Charleston and Dunbar; commutation tickets good between Charleston and Lock Six, 10 cents each; school tickets, forty for $1.20.

Would Charge 10 Cents in Utica.—The New York State Railways, Syracuse, has filed an application with the Public Service Commission, Second District, for a rate of fare of at least 10 cents instead of the present rate of 6 cents on its lines in Utica. The company, in its application, refers to the 33⅓ per cent increase in wages under an award on July 1, retroactive to May 1, claiming that prior to making this award the rate of fare was not adequate to meet the cost of operation and provide the company with a fair return. The company alleges that if the present rate of fare and the present wage schedules were applicable for the year Oct. 31, 1919, to Oct. 31, 1920, the operating loss to the company would be $146,784. For the six months ending Oct. 31, 1920, the operating loss was $87,095. For the year ending Dec. 31, 1919, the first full year of the 6-cent fare, the operating loss was $6,129. The company says a 10-cent fare, based on operating results for the year ending Oct. 31, 1920, will give the company a fair return on an investment of $6,221,279.

Personal Mention

H. S. Sweet, Engineer of Equipment

Harrison S. Sweet, heretofore master mechanic, New York State Railways, Utica lines, has been appointed to the newly-created position of engineer of equipment and shops of the New York State Railways System. Mr. Sweet will be associated with J. F. Uffert, superintendent of equipment, in supervising the maintenance of the railway's rolling stock. His duties will consist largely of the standardization of parts and car equipment and of other engineering work in connection with the equipment and shops.

F. L. McCann has been appointed master mechanic of the Utica lines, succeeding Mr. Sweet. Mr. McCann has been connected with the equipment department of the system for a number of years.

Mr. Sweet was graduated from Bucknell University in 1912 as an electrical engineer, subsequently spending about a year with the General Electric Company in laboratory and test work. He became connected with the New York State Railways in 1913.

C. Hackel, Chief Engineer

Charles Hackel, New York, has been named chief engineer for the Trenton & Mercer County Traction Corporation, Trenton, N. J., and has entered upon his new duties. Mr. Hackel is a native of Switzerland. He came to the United States at the age of ten years and located in New York City. He attended the grammar schools and a high school there and later entered the employ of the Consolidated Gas Company, New York. While engaged in this line of work he took a course in engineering at the Cooper Union, and was later made engineer at the Consolidated company's plant. After remaining there for seven years he accepted an appointment to the Western Electric Company in New York City. He was employed by that company for more than five years.

P. W. Pierson Promoted

P. W. Pierson, formerly seretary to Richard E. Danforth, vice-president and general manager of the Public Service Railway of New Jersey, has been promoted to the position of executive assistant to Mr. Danforth. Mr. Pierson is a graduate of the Rider, Moore & Stewart College and the Horton-Large Business Institute. He began his railroad career in 1903 with the Pennsylvania system, New York Division, in the operating and traffic departments. In 1905 he entered the employ of Public Service under Albert Stanley, then general manager of the property, and now, as Lord Ashfield, chairman of the London Underground Railways. Serving in the capacity of secretary and executive clerk, Mr. Pierson has worked his way up to his present position, in which he is charged with many responsibilities in the operation and maintenance of the Public Service properties.

W. Whiteford, Manager

Purchasing Agent of the Twin City Rapid Transit Company Succeeds Foster Hannaford, Resigned

William Whiteford, purchasing agent of the Twin City Rapid Transit Company, Minneapolis, Minn., has been promoted to acting general manager of the system to fill the vacancy caused by the resignation of Foster Hannaford. Mr. Hannaford is leaving the Twin City system to go into the mercantile field as vice-president of the firm of Noyes Brothers & Cutler, of St. Paul.

WILLIAM WHITEFORD

P. J. Metzdorf, for many years superintendent of parks for the Twin City lines, has been named assistant to the general manager. Mr. Metzdorf will make his headquarters in St. Paul.

Mr. Whiteford entered the service of the Twin City lines in August, 1903. His duties were those of extra clerk in the auditor's office. He was required to acquaint himself with the duties of the other members of the force, and to act as utility man whenever a temporary vacancy occurred. This proved to be the best kind of training for his later advancement.

In the spring of 1904 the general offices of the railway were moved to their present location at Hennepin Avenut and Eleventh Street, Minneapolis. Mr. Whiteford worked there for two years. In 1906 it was decided to return to the shops at Blaisdell Avenue and Thirty-first Street a portion of the auditor's work. Mr. Whiteford at that time became chief clerk of the shop accounting department. In 1907 he was appointed general storekeeper in charge of material and accounts. When in 1908 the company's shops were moved to University and Snelling Avenues, St. Paul, Mr. Whiteford established his office there.

Mr. Whiteford's next promotion came in 1914, shortly after George H. Hayes resigned as purchasing agent of the company to become comptroller at the University of Minnesota. The purchasing department was moved from the general offices and consolidated with the stores department at the Snelling shops, Mr. Whiteford being placed in charge. He held this position until his recent appointment as acting general manager of the Twin City lines. He was a member of the board of arbitration appointed to adjust the question of wages of the employees of the St. Paul City Railway.

Mr. Whiteford was born in Ardrossan, Scotland, in 1880. He came to the United States when he was eight years old and was educated in the Boston public schools. In December, 1900, he removed to Minneapolis, and for about two years worked for the Minneapolis Dry Goods Company.

Mr. Libbey Leaves Railway Work

J. H. Libbey, until recently electrical engineer of the Eastern Massachusetts Street Railway, Boston, Mass., has joined the organization of H. M. Haven & Wm. W. Crosby, engineers and architects, Boston. Mr. Libbey is widely known in electrical circles in New England. He was graduated in mechanical engineering in 1898 from the Lawrence Scientific School of Harvard University, and for a time was employed by the Bethlehem Steel Company, Bethlehem, Pa., in connection with high-speed tool steel development work under F. W. Taylor. For four years he was in the engineering organization of Westinghouse, Church, Kerr & Company at New York and Boston, and his early work included power plant development and construction on the Boston & Northern Street Railway, whose lines are now a part of the Eastern Massachusetts system.

During the period of design and construction of the electrified zone of the New York, New Haven & Hartford Railroad Mr. Libbey was assistant electrical engineer under W. S. Murray. He resigned from this post to join the engineering organization of Stone & Webster at Boston, Mass., with whom he remained for seven years. With that company his work embraced a variety of engineering problems including central station and power plant work, transmission and appraisals. For the past seven years he has been electrical engineer for the Bay State Street Railway, now the Eastern Massachusetts Street Railway. He had entire charge of the power supply on that property.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Some Spring Buying of Station Arresters Reported

Shipments Up to Two Months Ruling, Bringing Deliveries Up to Beginning of Storm Season

With shipments of the station type of lightning arresters running up around four, six and even eight weeks, depending upon the type of arrester and on the manufacturer, it does not seem to be too early to consider the advisability of placing orders for delivery and installation before the spring storms may be expected to set in. Parts for repair purposes and for replacements require virtually the same length of time.

Buying has not been heavy for this equipment, but already many companies have made known their needs and are awaiting shipment. Other companies are still behind and run a chance of having their equipment held up by longer deliveries if they put off their ordering until the factories begin to fill up their production capacity. There is reported a shortage in high-voltage porcelain for use with lightning arresters of the station type, and this is not surprising when the long deliveries of regular high-tension porcelain insulators are considered.

Calder Coal-Control Bill Is Securing Consideration

Opinion Expressed that Coal Business Should Be Put in Same Category with Public Utilities

While there is virtually no chance for any legislation at this session of Congress providing for federal regulation of the coal industry, the passage of the packers' bill and the hearings before the Senate committee on manufactures have had the effect of bringing about serious consideration of the Calder bill. This measure provides a rather drastic form of coal control in times of emergency, authorizes price fixing and the licensing of all those engaged in the trade. A permanent feature would be the compulsory filing of costs and profits and other statistical data, which would be made public in a way that would permit the consumer to analyze his coal costs.

Dr. George Otis Smith, director of the United States Geological Survey, told the committee on manufactures that the coal business could no longer be considered a private one. He expressed the opinion that it should be placed in the same category with the public utilities.

At the request of the committee, George W. Elliott, secretary of the National Committee on Gas and Electric Service, spoke to the following effect:

"The public utilities have suffered tremendously for the past year in their coal supply, principally through the flagrant disregard of contract obligations on the part of the coal operators. The public utilities consume annually 50,000,000 tons of coal. Much of this tonnage is contracted for yearly in advance. Coal that should have been furnished to public utilities in compliance with the contract obligations apparently was diverted to the spot market, where prices could be obtained far in excess of those stipulated in the various contracts. The alternatives of going into the open market would have been to curtail their output or to close their plants."

Mr. Elliott was not asked his opinion as to whether the Calder bill would remedy the situation and vouchsafed no opinion. It was made clear to the committee by him that the National Committee on Gas and Electric Service had held aloof from all matters concerning prices. Its activities in Washington had been confined generally to securing and expediting shipments of coal that already had been contracted for.

Quiet Market for Special Trackwork

Electric Railways Not Covering Spring Needs—Deliveries Are Good, with Lower Prices on Standard T-Rail Layouts, but No Reduction on Girder Rails

The market for special trackwork on the whole remains comparatively quiet. Steam roads are placing orders for standard T-rail frog and switch work in a fair volume. The large orders for straight rail sections already placed by the more important roads naturally have to be supplemented by special trackwork material for use in making replacements. Consequently some of the frog and switch shops report that they are keeping busy. Others have found it necessary to reduce working forces. Wage reductions in some instances are reported too.

Electric railways just now are not large factors in the special trackwork market. The tendency to hold off on placing orders that has been previously noted continues strongly. Perhaps in view of this tendency, the present year may yet see a good volume of business placed. In fact, if traction companies crowd into the market with late orders at the same time, it is very possible that deliveries may be pushed, especially on girder rails. This is because girder rail mills are pretty well booked up with orders for straight rail sections covering the spring season, and difficulty in obtaining a rolling in a hurry might be experienced.

This possibility is further enhanced by the policy of special trackwork manufacturers of not laying in a very large surplus supply of rails. The experience of more than one producer with standard T-rails which were bought at $57 a ton and had to be sold in the finished product on a $47 a ton basis under competition furnished a lesson in that respect. At present deliveries of frog, switch and crossing work are entirely favorable. If no undue change occurs in the market the likelihood is that they will remain so.

Prices on standard-rail layouts have been reduced in the same proportion as the recent settling of steel rail prices to the $47 a ton level. Girder rails, however, have not been reduced in price so far as can be learned. Consequently, girder-rail frog and switch work, while possibly shaded in price from the peak quotations, have not undergone any decided reduction. As so many other considerations enter into the manufacture of that class of material besides the basic cost, it may be long before any reduction can be made. In view of the downward trend to the steel, fuel and labor markets, however, the ultimate price tendency would seem to point to lower levels on girder rail layouts too.

Normal Replacement Orders for Brake Shoes

Slight Price Reduction Since First of the Year—Orders Can Be Filled from Stock

Current buying of brake shoes is lighter at this time of the year, possibly because not so many cars are in operation as during other seasons, and replacements are consequently less. Comparatively few new cars are being built too, although this source of demand is not an especially large factor in the business at any time. Electric railways are maintaining their brake shoe equipment in good shape, however, and buying on behalf of replacements, it is stated, is up to the standard of other years. Orders from steam roads, on the other hand, it is reported, are not so satisfactory.

Stocks of the finished product with manufacturers are not large, but are such that reasonable orders can be filled from stock. It is the policy of brake shoe manufacturers to maintain fairly large raw material stocks with which to replenish supplies of the finished product, but at the present time this surplus supply is probably lower than usual because the declining condition of the market induces cautious buying of material.

Prices have been reduced on brake shoes slightly since the first of the year. The reduction was brought about by lower prices of coke, pig iron, etc.

Copper Below Ten-Year Pre-War Average

To Keep Manufacturing Costs Low Present Would Seem to Be Time to Buy Red Metal

From the accompanying figures compiled by the *Engineering and Mining Journal* there is shown very clearly the course taken by copper during the year just passed. These figures give the average prices for each month of electrolytic copper f.o.b. refinery. The present spot market is quite inactive, and producers are holding at a nominal price of 12.75 cents.

January	18.92	July	18.58
February	18.57	August	18.35
March	18.33	September	18.14
April	18.66	October	15.93
May	18.48	November	14.26
June	18.07	December	13.19

On all sides is heard the criticism that prices of materials are far above pre-war prices. Copper is now quoted well below the average of the ten years before the war, which was approximately 15 cents, delivered. Indications seem to point to a slowly advancing price. Improvements in foreign exchange are expected to assist buying greatly. Manufacturers who expect to build up rapidly a future trade by lower costs must, it would appear, insure themselves against higher cost of raw materials by taking advantage of rock-bottom prices. There are many indications to encourage belief that copper is now lower than it will be at any other time, certainly during the coming year.

Quiet Market for Tubular Steel Poles

There is little activity in the tubular steel pole market at this time, although tubular products in general are responding to pretty good buying. This is making rather long shipments, up to four and six months being quoted. A recession in price of $15 a ton was put into effect about the middle of January by one of the steel tube plants not in the corporation, bringing this outside price nearer to corporation levels. Previous inquiries are being refigured on the basis of this new price.

Stock Deliveries of Heater Repair Parts

Market Quiet as Railways Fail to Cover Replacement Needs—Producers See No Lower Prices

Manufacturers of electric heaters report that they are in excellent shape to fill orders for repair parts. Reserve supplies of resistance wire, porcelain and the various metal parts are maintained at such a level that orders can be filled from stock. This condition is partly due to better shipments obtaining from manufacturers of wire, porcelain, steel, etc., and partly to a slack buying market.

Electric railways have not been covering their needs for repair heater parts. The winter to date, on the whole, has been far from severe, and this may be partly responsible, but probably even more potent reasons, it is stated, are lack of money and hopes for lower prices. At any rate the repair part buying has been far below the standard of other seasons. The market for complete heaters is very quiet too, as almost no orders have been placed recently.

Regarding prices, manufacturers discount any possibility of lower levels coming about for some time. Additional costs during the war, it is stated, were to a large extent absorbed by producers, and since that time the item of labor remains unchanged in this field. Porcelain is high and the drops in steel and in wire have not been enough to make much difference.

Good Buying of Lubricating Material

Some Producers Reduce the Price 10 per Cent Following the Drop in Crude Oil

Demand for lubricating oils and greases used by electric traction companies is naturally slightly less than during the summer peak period, but the total volume of sales, it is stated, remains entirely favorable. Inasmuch as street cars cannot well be operated without proper lubrication, producers are not as much affected by adverse business conditions as manufacturers of supplies in other lines. Those companies which supply electric railways with lubrication on a contract mileage basis report no difficulty in renewing contracts, while other concerns that supply oil chiefly on a gallonage basis state that sales are quite normal and up to expectations. Buying of track grease, too, has been up to the standard of the past. In fact, some companies claim that a campaign of education setting forth the advantages of using track grease has been producing results in the way of increased sales. Other companies, however, fail to notice any undue increase in this end of the business.

The supply of oil and grease is good at present. Traction companies are not in the habit of maintaining a very large supply at one time, but this practice is unnecessary inasmuch as sizable reserve stocks are maintained by producers at distribution points for immediate shipment. Competition in this line is now of the very keenest, and strenuous efforts toward rendering service and maintaining the quality of product are put forth by the various oil companies in order to secure and hold patronage.

Prices, following recent reductions in crude oil, have been reduced in commensurate amounts by several companies, the reduction amounting to about 10 per cent. Not all producers have taken this action, however. The further price tendency is dependent upon the trend that crude oil happens to take.

Rolling Stock

Northern Texas Traction Company, Fort Worth, Tex., through G. H. Clifford, vice-president and general manager, announces that the company is planning extensive improvements with a view to bettering the service. Four large modern cars will be ordered at once and other cars now in service will be overhauled. An increase in interurban fare is proposed.

Track and Roadway

Phoenix (Ariz.) Railway.—The Traction Commission has ordered City Engineer L. B. Hitchcock to make a complete survey of conditions along rights-of-way of the Phoenix Railway and to make a report shortly. The report will be based on necessary work to put the different thoroughfares in condition for travel. The thoroughfares will include intersections, portions of Monroe Street and Washington Street to Ninth Avenue.

Monroe (La.) Street Railway.—The Monroe City Commission has been petitioned by Pine Street property owners who ask for paving work on Pine Street from River Street to Seventh Street and for a removal of the tracks of the street railway.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Trenton & Mercer County Traction Corporation has informed the Trenton City Commission that it will relay tracks and place new paving on Pennington Avenue, North Clinton Avenue, Mulberry Street and West State Street. The company will also install conduits on Lincoln Avenue to connect with the power house to take the place of wires.

Toronto, Ont.—One of the first matters to be considered by the new City Council will be a request from the local Transportation Commission that application be made to the Legislature for power to construct new car lines as local improvements.

Frankford Elevated Railway, Philadelphia, Pa.—The Department of City Transit, Philadelphia, will accept proposals for car motors, plumbing, heating and lighting for the work appurtenant to the Frankford Elevated Railway until Feb. 8.

Quebec (Que.) Street Railway.—A resolution was passed by the Quebec Board of Trade urging the Quebec Railway to establish a trolley line between the city and the Quebec bridge.

Knoxville Railway & Light Company, Knoxville, Tenn.—Citizens living along Morelia Avenue, Oakwood, have started a movement to petition the City Commission and the Knoxville Railway & Light Company to have the track removed from the south side to the middle of the avenue. Residents, it is said, will pay for paving expenses if the track should be changed.

Central Texas Interurban Railway, Bryan, Tex.—The County Commissioners' Court at Bryan, Tex., halted the removal of the tracks of the Central Texas Interurban line running from Bryan to College Station, which was sold several months ago under foreclosure proceedings to Sam Wexler. Wexler had just begun taking up the rails when an injunction was granted. The County Commissioners claimed that taxes due the county on the line amounting to $5,117 remain unpaid.

Greenville, Tex.—The City Council of Greenville, Tex., acting under the authority recently given them by referendum when the voters of Greenville voted to retain and operate the street railway system as a municipally owned utility, has outlined a plan for extensive repairs and betterments in the street car lines. Two belt lines, one to loop the southwestern and the other the southeastern parts of the city, are proposed, and a line to Wesley College and to the suburb of Peniel will also be built. A citizens' committee to co-operate with the City Council in working out plans for improving and operating the street car system has been appointed. The street cars had not been operated for three years prior to their sale to the city late last year.

Trade Notes

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, announces that its Atlanta district office has been transferred to Birmingham, Ala., room 302, American Trust Building. Quin W. Stuart continues as district manager.

The U. T. Hungerford Brass & Copper Company, New York City, announces that it has established a monel-metal department in charge of John J. Dillon, who for eight years has made a specialty of this metal and its products.

The Electric Power Equipment Corporation, which was formerly the Lewis & Roth Corporation, has its office and factory at Thirteenth and Wood Streets, Philadelphia, and its officers are L. R. Lewis, president; J. H. Gledhill, vice-president; N. S. Moore, secretary, and F. W. Dinsmore, treasurer.

W. H. Corddry, of the Harrisburg office of Gannett, Seelye & Fleming, Inc., consulting engineers, has been placed in charge of the Memphis office of the firm, which covers engineering design, construction, reports and valuation for public utilities.

The James Leffel & Company has recently completed and occupied an entirely new factory and offices in Springfield, Ohio. The main factory is 75 ft. wide by 800 ft. long, from which extend the boiler shop, power plant, foundry, pattern shop, pattern storage, warehouse and garage.

Linke-Hoffmann Werke Aktiengesellschaft.—In the issue of this paper for Dec. 4, 1920, page 1153, an illustrated account was given of two recent types of center-entrance cars used in Germany. These cars were built by the Linke-Hofmann Werke Aktiengesellschaft, which three years ago took over the works of the Waggonfabrik P. Herbrand & Company. The works are located at Cologne-Ehrenfeld.

Griffin Car Wheel Company, Council Bluffs, Iowa, is pushing work on its new million dollar plant. Structural steel for the fourth building is being placed and new machinery installed. Two large cranes have been erected and nearly all the hydraulic machinery is on the ground. The annealing pits, of which there are seventy-two, are being installed. The plant will cover, it is reported, over 70 acres.

American Brake Shoe Elects Officers.—At a meeting of the board of directors of the American Brake Shoe & Foundry Company, 30 Church Street, New York City, held on Jan. 11, William B. Given, Jr., and W. F. Cutler were elected vice-presidents of the company. Mr. Given was formerly assistant vice-president and Mr. Cutler was and still retains the office of president of the Southern Wheel Company.

The Northern Engineering Works, Detroit, Mich., have established a new office at 990 Union Arcade Building, Pittsburgh, in charge of J. B. Laird, who has heretofore represented the company in western New York and northern Pennsylvania. Mr. Laird will cover the entire East and Ohio Valley and for the present will also look after the Buffalo district. The company manufactures cranes and hoists.

The Black & Decker Company, Baltimore, Md., announces that in spite of general conditions in 1920 it was the most successful year in the company's history, net sales being nearly 40 per cent greater than the highest previous year, 1919. Dividends of about 7 per cent were paid on the common stock of the company, the last one being on Dec. 31, 1920. The board of directors has been augmented from five to seven by the election of Charles C. Homer, Jr., and William G. Baker, Jr., both of Baltimore.

The Canadian Cleveland Fare Box Company, Ltd., Preston, Ont., has been formed. It is a development of the organization which formerly operated under the name M. C. McElligott, who now becomes president of the new company, with L. L. McElligott as vice-president and secretary. The change has been necessitated by the rapid expansion of the business, which, Mr. McElligott advises, has caused an increase in space of 400 per cent and in the staff of 100 per cent within the last four months.

The Chicago Pneumatic Tool Company, 6 East Forty-fourth Street, New York City, announces the appointment of J. F. Huvane as Eastern manager of compressor and engine sales, with headquarters at 6 East Forty-fourth Street, New York City, and G. C. Van den Boom as Western manager of compressor and engine sales, with headquarters at 300 North Michigan Boulevard, Chicago. The company also announces the resignation of H. L. Dean, formerly manager of the compressor and engine sales.

The National Foreign Trade Council will hold its eighth annual convention at Cleveland, Ohio, on May 4, 5, 6 and 7. The organization, which is devoted to promoting foreign trade extension throughout the world and which contains in its membership about 75 representatives of leading business interests, has appointed a committee of fifty representative Clevelanders to take charge of the preliminary arrangements for the convention. Headquarters of the committee is at 409 Park Building, Cleveland.

The Engineering Business Exchange, 30 Church Street, New York City, engaged in the purchase and sale of engineering and technical business properties, announces the opening of a Pacific coast branch in charge of James T. Whittlesey with offices in the Claus Spreckels Bldg., San Francisco. Mr. Whittlesey, who is a Yale graduate, for twelve years was chief engineer of the Public Service Electric Company of New Jersey and since his removal to California eight years ago, has been engaged in a general engineering consulting practise.

New Advertising Literature

Rubber Gloves.—The Seamless Rubber Company, Inc., New Haven, Conn., distributing a leaflet describing its "Maderite" brand of electric linemen's gloves, etc.

Lubrication.—"Lubrication of Hydraulic Turbines" is the subject of the leading article appearing in the December, 1920, issue of *Lubrication*, a monthly publication which is issued by the Texas Company, 17 Battery Place, New York City.

Industrial Haulage.—The General Electric Company, Schenectady, N. Y., has issued an illustrated bulletin, No. 44,251, describing its different types of electric locomotives for industrial haulage.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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We're Not Talking to the Right People

THE past few weeks have given added evidence that the best publicity efforts of the industry are very inefficiently utilized. At the last meetings of the Central Electric Railway Association and the Indiana Public Utility Association W. L. Goodwin and E. K. Hall, respectively, gave addresses that would have been of inestimable assistance if they had only been addressed to the public at large. Their value was not all lost, of course, for these men talked with the idea of putting words into the mouths of the railway men to pass along to the public. But, unfortunately, few people, and this includes utility executives, have the gift of talking about their business in a public meeting in a way that both interests and impresses. The efficiency with which these speeches will reach the public is thrice decimated by the absorption power of the man who listened to either, by his probable failure to pass the speech along, and by his poor speaking if he makes the effort.

Ways must be found to get such speakers as those named before the public, so that the latter will hear them at first hand. This fact that addresses such as these are not being made to the right people a good part of the time is not a new thought, but it emphasizes the argument put forth by Mr. Goodwin at Indianapolis recently that what the electric railway companies need are sales managers. It also proves that the publicity problem of the railways now is largely a matter of how to reach the people effectively rather than what to tell them and that every practicable means of publicity must be used.

The Falling Ride Rate Versus Wage and Fare Revision

THE detail statistical reports for the last month or two are not yet to hand, but informal discussions among groups of electric railway men bring out the dour fact that the industrial depression has begun to hit the rate of riding pretty hard. In some places the loss is confined almost entirely to the peak-hour or home-factory traffic, with no diminution in the more voluntary riding. In at least one place, however, there was an abrupt falling off in shopping traffic a full week before Christmas, induced by a panicky feeling among the many foreign workers that the lay-offs were going to last longer and the cuts in wages be more drastic than first expected.

Facts like these indicate that the electric railways are again likely to suffer innocently from what might be termed the "economic lag of a public utility." Yesterday fares or revenues were not permitted to rise as fast as the cost of unregulated commodities. Today, with the fares in many cities at the desired level, the purchasing power and riding necessities of vast masses are greatly decreased long before electric railways can hope to lower their operating expenses per car-mile. For one thing, rents and fuel are still at such high levels and the actual, permanent drop in the cost of food staples is still so uncertain that anything like an early drastic cut in wages is sure to provoke trouble. It is true that track laborers and other small groups, including at least one president and his staff, have already been sliced, but, as all know, the wages of the platform men are the *bête noire.* As a class, these men will stand out for the letter of their contracts, many of which have nearly half a year to run. Under the circumstances, the wisest course for the managements to follow is to secure all possible data on the late adjustments in living costs, so that when the inevitable arbitration proceedings begin they will be prepared to present a case that will meet public sympathy when coupled with the slogan, "We cannot reduce fares in the face of declining traffic unless we can reduce our payments for our two biggest items—coal and labor."

Long-Lived Track and Wood Preservation

THERE has been some disagreement among track engineers on the question of the value and the need for preservative treatment of wood ties when laid in conjunction with well-paved track. Not a little light is thrown on the subject through the article by W. L. Whitlock in the issue of this paper for Jan. 22, wherein the statement is made that treated hemlock ties were found to be in a good state of preservation after twenty-two years of service in the tracks of the Denver Tramway.

Hemlock ties, untreated, have an average life of five years in open track, according to estimates on tie life given in H. F. Weiss' book on timber preservation. On this basis the results reported for the Denver installation indicate that the treatment has increased the life of the tie more than four times the estimated untreated life. Mr. Weiss gives the estimated life of treated hemlock ties in open track as fifteen years. Hence, it may reasonably be argued that the track pavement under which the ties in question have been in service, by keeping the ties in a fixed state of moisture content, has added seven years to the estimated treated life of hemlock ties.

Mr. Whitlock also states his belief that the good waterproof pavement, which was wisely installed when the tracks were built, proved to be a prominent factor in preserving the other parts of the track structure and accounts for the remarkably small amount of deterioration found in all details of the track. This statement fits in with the observations of the editors of this paper to the effect that good pavements are essential to good tracks and that when the water is kept out of the substructure the pavement acts as a real track life preserver. "Keep the water out" has become an axiom in the track engineer's manual.

This information from Denver should lead track engineers to investigate comparative cost of the treated hemlock tie as a substitute for the more expensive oak, yellow pine and chestnut ties which have prevailed heretofore, and a considerable impetus should be given to the use of preservative treatments for ties, no matter what wood they are made of. In this connection it is very opportune that the three standing committees of the Engineering Association which are most concerned with this subject have been asked to prepare reports on wood preservation, because the subject is assuming an increased importance in the search for every available means of reducing maintenance cost.

Action on the Reports at Chicago

THE discussion being published in this paper on the proposed indorsement by the association at the Chicago conference of the reports of the Federal Electric Railways Commission and the Chamber of Commerce committee shows that the difference of opinion on such action centers largely about two points. One of these is clause XV of the federal report, which recommends the adjustment of the capitalization of a railway company to correspond with the valuation of the property employed in public service. The clause reads that a fair valuation of the property of every utility should be made and then that "the company should voluntarily reduce any excessive capitalization on the basis of such value." Although not so stated in the report, it may be assumed that the commission believes the converse is equally true and recommends an increase in the capitalization if such is necessary to make the capitalization equal the value of the property.

The report of the Chamber of Commerce committee declares in one place that the public should allow a fair return upon the value of the property used in rendering the service but should not be asked to pay more, but this report does not make any recommendations as to capitalization.

The second clause in the federal report to which criticism has been particularly directed is XVIII, which says that cost-of-service contracts are in an experimental stage, but where they have been tried they seem to have secured a fair return upon capital, established credit and effected reasonably satisfactory public service. It adds that such contracts may safely be entered into where the public right eventually to acquire the property is safeguarded. As this indorsement is quite tentative objections to Clause XV are rather more important.

Mr. Cobb, under the title "A Car Rider's Reply," discusses Clause XV directly and presents a point of view which undoubtedly is widely held. Briefly, he declares that if the railway does not earn more than a fair return upon a fair valuation the public is not concerned as to how the return is divided among the different classes of securities. Moreover, he points out that in some cases at least it would be very difficult without the appointment of a receiver for a company to scale down its capitalization, and that this step would often work great hardship on many classes of security holders.

Undoubtedly this view is correct. It may be admitted that good service to the public can be given by a company even if its capitalization does not exactly correspond with the value of its property. Nevertheless this does not preclude the industry, as an industry, from accepting both of these reports as outlining bases which are desirable and toward which practice can trend in the relations of the companies and public.

To some any action approving the report may not seem necessary. Most if not all companies, they say, are now doing all that these reports enjoin, at least in essence, so why "indorse" them? Will not such approval give the impression that the reports favor the companies unduly and so prejudice the acceptance of their principles by the public?

This argument, too, has some reason, but it is believed by those who favor indorsement that the advantages of so doing far outweigh those of rejection. They show that the companies no longer consider a franchise as an opportunity for large private profit, but that their duties are of a public nature though directed by private management. This conception of the function of a utility, though common now in the industry, is not yet fully understood by the public. If indorsement of the reports at Chicago will help this idea a step forward will be gained.

Bookkeeping in Connection with Power Plant Operation

INEFFICIENCY cannot be tolerated in the power plant today, with fuel cost about 80 per cent of the total cost of operation and with the example of many a good installation producing power at 15 per cent thermal efficiency. The remedy is to operate in the light of facts disclosed by systematic testing. To be sure, tests are a nuisance. They disrupt routine operation and they require the services of expert technicians if best results are to be secured. However, if as a result of tests dollars are saved the tests contribute to the accomplishment of the object of the power plant, namely, to produce power economically.

Nearly all plant engineers perform routine tests on equipment, and many secure data necessary for maintaining a continuous heat balance. Other engineers, however, think of the test itself as the chief feature of their work, and they prefer to specialize on testing of only one type of their plant equipment. Some spend their time on combustion and boiler tests, others on prime mover tests, and still others on tests of steam traps and auxiliaries. Such a plan of power-plant testing furnishes no indication of plant efficiency. This follows because, for example, more heat may be lost through frequent cleaning and blowing down of boiler tubes than is saved by a slight gain in boiler efficiency; again, more heat may be lost by improper type or condition of auxiliaries than is saved by efficient prime movers.

To borrow an illustration from another field, the manager of a department store cannot devote his attention to the shoe department this week, the hardware department next week, the housefurnishing department the week after next, etc., and be certain that his whole store is operating well merely because the housefurnishing or some other department is operating at maximum efficiency. He knows what his store efficiency by a careful and systematic study of the day-to-day bookkeeping records of all departments and the monthly balance sheet.

Similarly, a continuous heat balance is the only logical method for maintaining maximum power plant efficiency. It serves to eliminate needless tests and to indicate when tests are necessary. Tests in themselves serve only to fix the limits in the heat balance.

A continuous heat balance involves some financial outlay and a slight change in operating routine, but the cost of weighing coal daily, measuring CO_2 and flue gas temperature, determining the B.t.u. content of fuel, metering the steam produced, etc., will be more than offset by the increased economy. Modern conditions cause a power plant engineer to keep both a day-book and a ledger if he wishes to operate efficiently, and the bookkeeping cost is not a factor to be compared with the value of exact knowledge of the operating conditions of the plant.

The Word "Justice" Causes a Shock

IT IS NOTEWORTHY, though not surprising, that a great outcry has been raised in certain circles in New York over Governor Miller's message in which he recommends "exact justice to all" in the New York transportation situation. Violent protests are being made against "8-cent fares" and what is called "robbing the people," and a newspaper campaign has been begun against the "Traction Trust," which is represented in familiar cartoonist style as a very stout individual buffeting and getting the best in other ways of a meek and diminutive man labeled "voter." Nevertheless Governor Miller's message may be read in vain for any reference to either an 8-cent charge for city transportation or even for a higher fare. He does, it is true, say that the transportation systems are headed toward disaster, and he expresses his wish to save both them and the city from selfish politicians and financiers, after an examination of the situation by a commission shall disclose the most desirable plan. Surely even his opponents should agree with him in his desire to have justice done in the matter. Why justice raises visions in their minds of an 8-cent fare may well be left to their consciences to answer.

In fact, the chief argument brought against revision of the transportation changes in New York by its opponents up to this time is that a 5-cent fare is nominated in the bond and must be continued or the city will exact its pound of flesh, whether or not its victim dies in the process. In this particular case, however, strict insistence on the terms of the bond is as bad for the city as for the company. A community of the size of New York is peculiarly dependent upon its transportation system and upon the expansion of its transportation facilities with its own growth. Hence there is every reason for a policy of getting together and mutual concession and the call for the exercise of state sovereignty in case the present city authorities fail to rise to their duty and their opportunities. The policy of dilly-dally must give way to something constructive.

Employers Can Well Encourage Thrift Campaigns

IN ONE of the recent advertising letters on thrift which Henry L. Doherty is publishing in the New York daily papers he brings out the close interest which employers ought to have in the present movement for thrift. They are concerned with it in many ways. Poverty in the community, always a drag upon its energies, would be reduced. The acquisition of property by a person, especially when earned by him, helps toward self-respect and regard for the property rights of others, and the added credit of the nation gained through thrift stimulates industrial enterprises and helps for prosperity.

It is needless to say that electric railway companies which are seekers after credit to develop their properties would gain greatly by a nation-wide campaign for thrift. Their men also are in a good position in many ways to join thrift movements because of the continuity of their work, which is not subject to the periods of non-employment common in other industries. This regularity of work does away with the demoralization in saving plans occasioned by periods of high income alternated by periods of no income, so that railway men should be able more easily to live according to a budget, which is a great help in saving campaigns.

It may be that some will say that the earnings of an electric railway employee are inadequate to permit him to join a thrift club, but this is not so. Every one who is at steady work can save something, except under unusual circumstances, and even if this was not the case with all railway operators those with few family responsibilities can save something if the same wages are adequate for another to support a large family. Moreover, it is being done. On the Philadelphia Rapid Transit system, for instance, the annual subscriptions of the employees to their thrift fund now amounts to more than $1,000,000.

The point cannot be too strongly stressed, however, that the advantages which will come by such a movement to electric railways and other enterprises requiring an influx of capital are not dependent upon the investment by thrift organizations in securities of such companies. Some of the capital will undoubtedly go into good utility securities, but if it was all invested in government bonds, there would still be great benefit to the railways. In fact, we see certain objections to the investment by a thrift society made up of employees of a company in the securities of that company unless possibly in bonds of a thoroughly fundamental character. Otherwise, it is a good deal like putting all of one's eggs in one basket. But it is obvious that the tendency, and a desirable tendency, will be for much of these thrift savings to go into the underlying securities of enterprises of a productive character. This will help to develop the country and provide employment for many.

Quotation from the Federal Electric Railways Commission Report

No. 6

THERE can be no satisfactory solution of the electric railway problem which does not include the fair valuation of the property employed in the public service, and where that is done the companies should voluntarily reduce any excessive capitalization to the basis of such value.

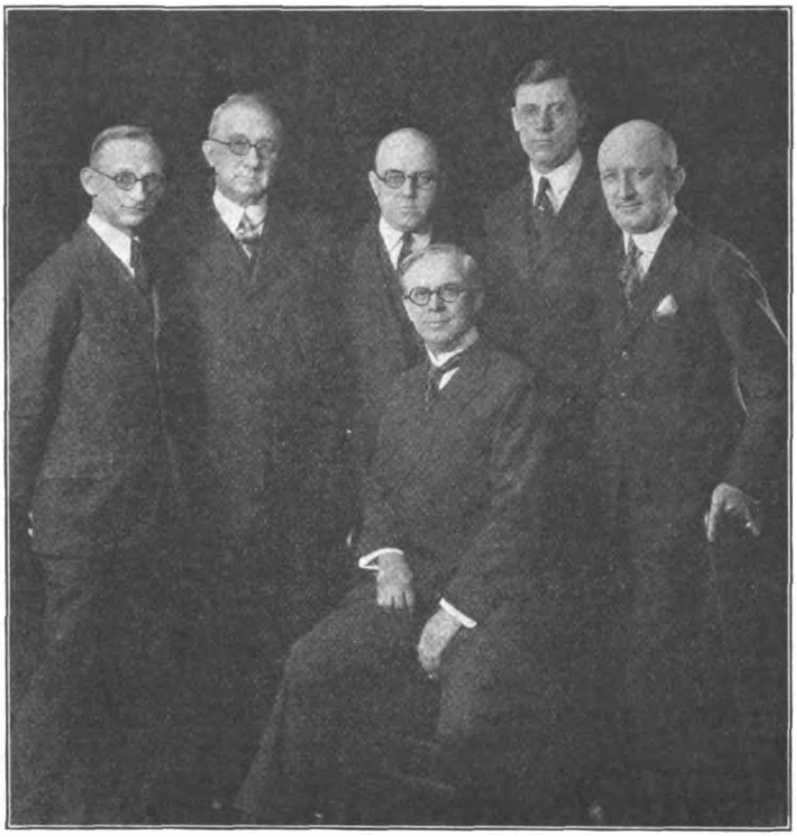
Your commission believes that excessive payments to the underlying companies by the operating company have greatly diminished the net operating revenue and that there can be no satisfactory solution of the street railway problem in such communities until the system has been valued as a whole and the accounts so kept that the public may know that the rate of fare paid yields no more than fair return upon the value of such property.

How Indiana's Commission Works

In the Hoosier State the Commission Is Proud of Its Record—Receiverships Have Been Avoided, Low Car Fares Have Been Maintained and an Optimistic Outlook for the Future Has Been Established—The Progressive Policies of the Commission Have Been an Important Element in the Situation

IN A RECENT address before the convention of the National Municipal League at Indianapolis E. I. Lewis, chairman of the Indiana Public Service Commission, referring to commission control of utilities, made the following significant statement:

> In behalf of such operation and control, adopted in this state, I would point to the fact that only one of the present 118 electric railway receiverships in the country is in Indiana and that receivership antedates the war disturbances and will be closed this year; that only six of the 600 cities having more than 5-cent fare are in this state, and that the street railways in Indiana emerge from the trying ordeals of the post-war period solvent and hopeful. In more than 1,400 utilities of all kinds in the state there are not to exceed a half dozen receiverships, and the commission points with considerable pride to the fact that they have not resulted from the confusions and disturbances incident to and following in the trail of war. While no utilities have been going into receiverships, the commission during the war period has brought a number out and established them on sound bases for future usefulness as agencies of service and as corporations offering secure investment.



MEMBERS OF THE PUBLIC SERVICE COMMISSION OF INDIANA

Seated, E. I. Lewis, chairman. Standing, left to right, Commissioners Fred Bates Johnson, John W. McCardle, Paul P. Haynes, Glenn A. Van Auken and Secretary Carl H. Mote (resigned)

The Indiana Public Service Commission was established by legislative enactment in 1913, the new organization superseding the original Railroad Commission of 1905. This legislative act is patterned very closely after that of the State of Wisconsin. It was not until the establishment of the present personnel, however, in May, 1917, with E. I. Lewis of Indianapolis as chairman, that the new progressive policies in utility regulation were inaugurated. While Mr. Lewis as chairman has had the leadership, the progressive cast of the commission has been sustained throughout the entire membership. The other commissioners are John W. McCardle of Indianapolis, Paul P. Haynes of Anderson, Glenn Van Auken of Auburn and Fred B. Johnson of Indianapolis. Carl Mote, who has been secretary of the commission since May 1, 1917, has just recently resigned.

Six distinct departments comprise the organization of the Indiana Public Service Commission, each directed as follows: (1) H. O. Garman, chief engineer; (2) Harry Boggs, chief accountant; (3) A. B. Cronk, chief of the traffic department; (4) D. E. Matthews, chief railroad inspector; (5) R. D. Armstrong, librarian; and (6) M. D. Atwater, director of service.

The charts on page 256 indicate very forcefully the burden of cases taken over by the present administration and the expediency with which both old and new cases have been dispatched. Over two hundred more cases have been disposed of in 1920 than in the previous year, the work of the commission, of course, having been unusually heavy, due to the abnormal rise in prices of materials and wages and resulting operating cost. The Indiana commission, during the trying war and post-war days, has concerned itself with maximum revenues instead of maximum rates. It has insisted that the lowest rates will often produce the most revenues, with the result that rates in Indiana probably show lower levels than in most states, while receiverships also are lower and the utilities in sounder and more optimistic condition. From the report for the year 1919 the following quotation is significant:

> The unfavorable operating conditions of the last year are responsible for most of the rate cases before the commission. In many cases it is impossible to fix rates that will yield the revenue needed to maintain service and provide a normal return on investment, for the reason that to increase the rates beyond a certain point would have the effect of discouraging business and reducing net income, thus laying a burden on the public without achieving the purpose of the increase. No public utility can operate successfully on inadequate rates. The inevitable result is poor quality of service, inability to make needed extensions to assist in developing the community, and in extreme cases discontinuance of service and junking of plants needed by the public. The commission has found little disposition on the part of the public to deny the utilities revenue needed for these purposes. It has gone on the assumption that its prime duty during the emergency is to keep necessary public utilities in operation, with as good quality of service and as liberal extension of service as can be secured.

The conditions for the year 1920 have not been materially different, the same quotation being referred to in the 1920 report as representative of that year as well. The coming year is considered to be one, however, in which promises of substantial relief may be extended for lower prices to consumers, better returns to utilities and fewer abnormal readjustments necessary on the part of commissions.

In spite of the high costs of materials and labor additions to utility plants have been made during the past year under the general supervision of the commission valued at $13,189,530. These are distributed as indicated in the table shown below.

From this table it will be noted that the interurban and street railways of Indiana have been able to do their portion of the total construction work actually accomplished. The commission estimates, however, that public interest demands that the expenditures indicated in the table be made to serve adequately the public needs for the next two years. These are exclusive of the needs of the steam railroads.

M. D. ATWATER,
director of service, provides photographic exhibits for hearings

The plan, rather unique in Indiana, which has enabled this commission to consider and settle satisfactorily so many cases in a given time has been to appoint for the responsible heads of the various departments experienced men capable of hearing minor cases themselves and either effecting a compromise agreement among the parties at the hearing or reporting back a proposed finding for consideration and formal approval by at least three members of the commission.

Generally speaking, the formal presentation of a case by counsel and the hearing of lengthy expert testimony, except in very important cases, have been discouraged. Officers of the smaller companies and complainants, possibly accompanied by engineers to advise their clients upon technical problems, have been encouraged to present informally their cases, often without legal counsel, before the chief engineer, director of service, or examiners of the commission. One typical case, involving rather serious interference between light and power transmission lines and rural telephone service, was amicably settled in a hearing of about two hours' duration before the chief engineer, the parties involved having been advised by two different members of the instructional staff of the School of Electrical Engineering of Purdue University. A formal dismissal of the case written by the commission closed the issue.

This important department of the commission has been directed by H. O. Garman throughout the entire period the public service act has been in force, during which time both political parties have been in office. The staff is made up of experienced investigators, mostly graduates of Purdue and Indiana Universities.

During the past year alone this department has appraised property values equal to 30 per cent of the entire valuations made since the commission was organized in 1913. That the electric railways have had sufficient consideration in this matter is indicated by the valuations of the table given below.

The difficulties accompanying an equitable appraisal during the period of widely fluctuating unit costs are well illustrated by the recent statement of Mr. Garman to the effect that:

> All the utilities of the city of Indianapolis could be appraised at any figure from $50,000,000 to $120,000,000, depending upon the point of view of the body making the appraisement. At present the general policy is to use twenty-year average price on steel rails, fifteen-year average price on copper wire and ten-year average price on cedar poles, because the one-year averages are entirely out of proportion to the actual costs.

H. O. GARMAN
has been chief engineer since the commission was organized in 1913

> Plant equipment, such as engines, boilers, pumps, generators, switchboards, etc., is priced after the making of a study of the actual original cost new as indicated by the contracts and specifications, when available, the cost of similar equipment purchased about the same time, and the present-day cost of similar equipment. A figure is finally applied which is considered ample to reproduce each piece of equipment under the approximate circumstances and conditions obtaining during the time these prices of equipment were purchased and installed.

The question of the proper appraisal of pavement, which is often the subject of controversy in rate cases, has been standardized by the engineering department.

> In no case do we allow cost of cutting pavement when the pavement was put down subsequent to the laying of the mains and services. We endeavor to determine in each case the amount and kind of paving actually cut and upon these items put a price which is substantially a five-year average cost. All pavement cut to repair mains and services should be paid for out of the maintenance fund and is an operating expense and not a capital charge, and is therefore excluded from the appraisal.

An amount in general equal to 12 per cent of the total of all items of the appraisal exclusive of material and supplies is used as a tentative figure known as "structural overhead expense."

> If the evidence shows that this cost was paid out of operating expenses by the company we suggest that it be eliminated, and if the evidence shows beyond a shadow of a doubt that more than this much was spent and that it has not been included in any of the unit prices then this percentage should be increased. The item of structural overhead cost should include such costs as engineering, superintendence, interest during construction, taxes during construction, fire and liability insurance, small omissions of inventory, contingencies, etc.

RECENT AND DESIRABLE UTILITY EXPENDITURES

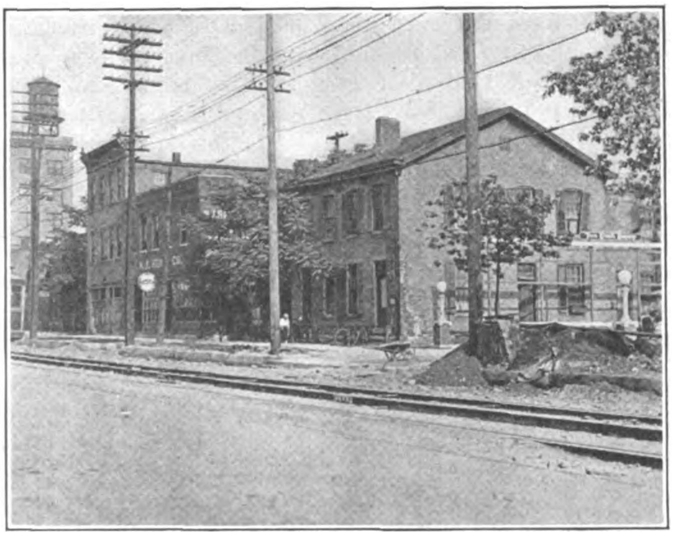
	Expended in 1920	Desirable for Next Two Years
Municipal electric	$370,000	$15,000,000
Electric	4,747,100	....
Electric interurban railways	1,191,000	32,700,000
Electric street railways	2,527,500	17,000,000
Gas	71,000	8,000,000
Hot water heating	....	....
Steam railroads	1,635,000	....
Telephone	1,499,055	12,000,000
Water	1,148,875	3,000,000
	$13,189,530	$87,700,000

APPRAISALS BY ENGINEERING DEPARTMENT

	May 1, 1913, to Sept. 30, 1919	Oct. 1, 1919, to Sept. 30, 1920	Total
Electric	$33,787,233	$9,445,769	$43,233,002
Electric railways	43,572,015	10,626,248	54,198,263
Gas	25,709,154	12,031,135	37,740,289
Heat	4,362,012	722,103	5,084,115
Telephone	20,033,242	22,111,917	42,145,609
Water	18,727,097	6,951,167	25,678,264
	$146,190,753	$61,888,339	$208,079,542

The Indiana commission endeavors to determine an equitable "fair value" of appraised property after the engineering department has submitted in its report all of the available evidence usually associated with "original cost" and "present value." To arrive at such a value under present conditions is a difficult problem.

> The commission is of the opinion that until sufficient time has elapsed to demonstrate conclusively that a new and fairly permanent higher price level has been reached normal cost of reproduction should be determined by costs prevailing immediately before the European war, with a consideration, perhaps, of what may reasonably be calculated to be a natural trend of prices had the war and other abnormal conditions not occurred.

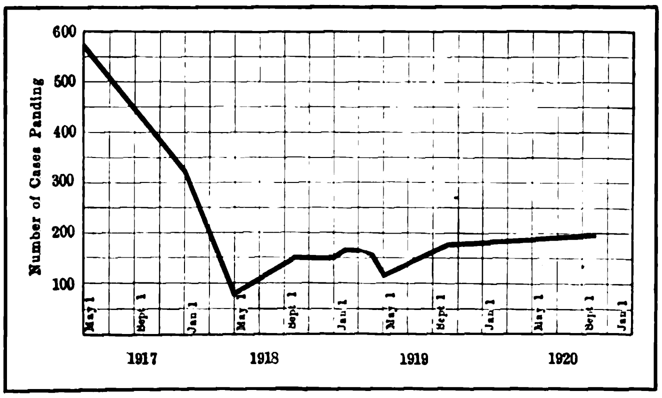


POLE MOVED AND EXTRA POLE SET IN SPAN AT EXPENSE OF PROPERTY OWNER TO IMPROVE ENTRANCE TO GASOLINE SERVICE STATION

In its consideration of "going value," a term always interpreted with difficulty, the commission seriously attacks one common method of predetermination of such a value amounting to $4,592,367, which was rejected in a decision in the Central Union Telephone Company case.

> The commission cannot accept petitioner's claim for going value nor can it approve the methods by which petitioner calculates his claim. To this commission it appears utterly unreasonable to base an allowance for going value upon the imaginary cost of presently reproducing or re-establishing a business which, under the wildest flight of fancy, never will be completely reproduced or re-established.

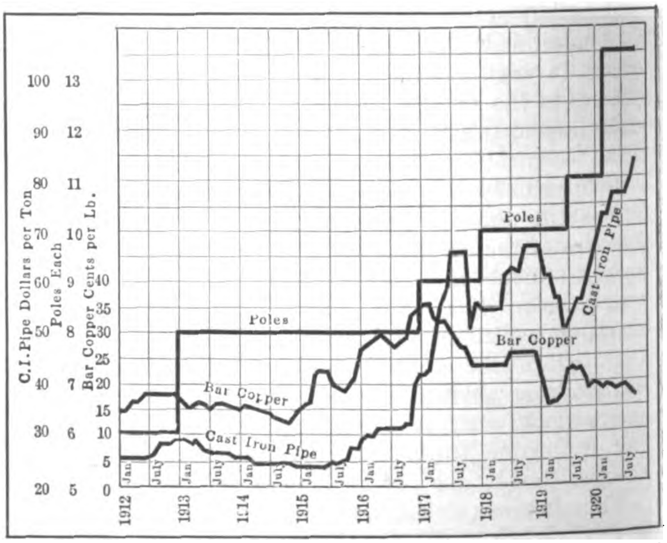
A rather unusual policy has been adopted by the engineering department with regard to meter testing and standardization. Practically no such calibration is done by the department itself. In fact, no standards are maintained by the department except for purposes of illustration of those which the utilities are required to install. The entire responsibility in matters of standards of service is placed upon the utility and the municipalities, such matters coming to the commission only on appeal. In the few appealed cases which come up the test is usually made on the consumers' premises under the observation of a representative of the engineering department of the commission. In many instances utilities are requested to send their standards to the State university or to commercial testing laboratories for calibration. The commission charges no fees for tests.



EFFICIENCY OF PRESENT ORGANIZATION IS INDICATED BY REDUCTION IN CASES PENDING

The librarian of this commission not only performs the usual functions of such an office but holds hearings in the rôle of examiner for the commission and reports to the commission upon many special problems. Among such 1920 reports which will be found on file in the library should be noted the following, of particular interest to electric railway executives:

1. Power of commission to compel priority in coal car distribution to mines supplying public utilities.
2. Whether in approving a purchase and sale the commission must find that the consideration represents the value of the property.
3. Power of the commission to order a depreciation reserve to be set aside *in cash*.
4. Power of the commission to authorize the issuance of securities to represent the surplus of a public utility.
5. The necessity and legality of a municipal election to approve purchase of property by the municipality from a public utility whose stock is owned by the municipality.
6. Power of city in connection with the obstruction by trains of crossings of city streets and railroads.
7. Power of commission to order spur tracks for shipper to build across land of another owner.
8. Power of commission to order steam railroads to tender cars to traction company at junction of steam railroad and switch tracks of traction company for transportation to shipper on switch track.



UNIT COST VARIATIONS MAKE EQUITABLE APPRAISALS DIFFICULT

9. Power of municipalities to lease their public utilities to private corporations.
10. Power of commission to order a stock dividend.

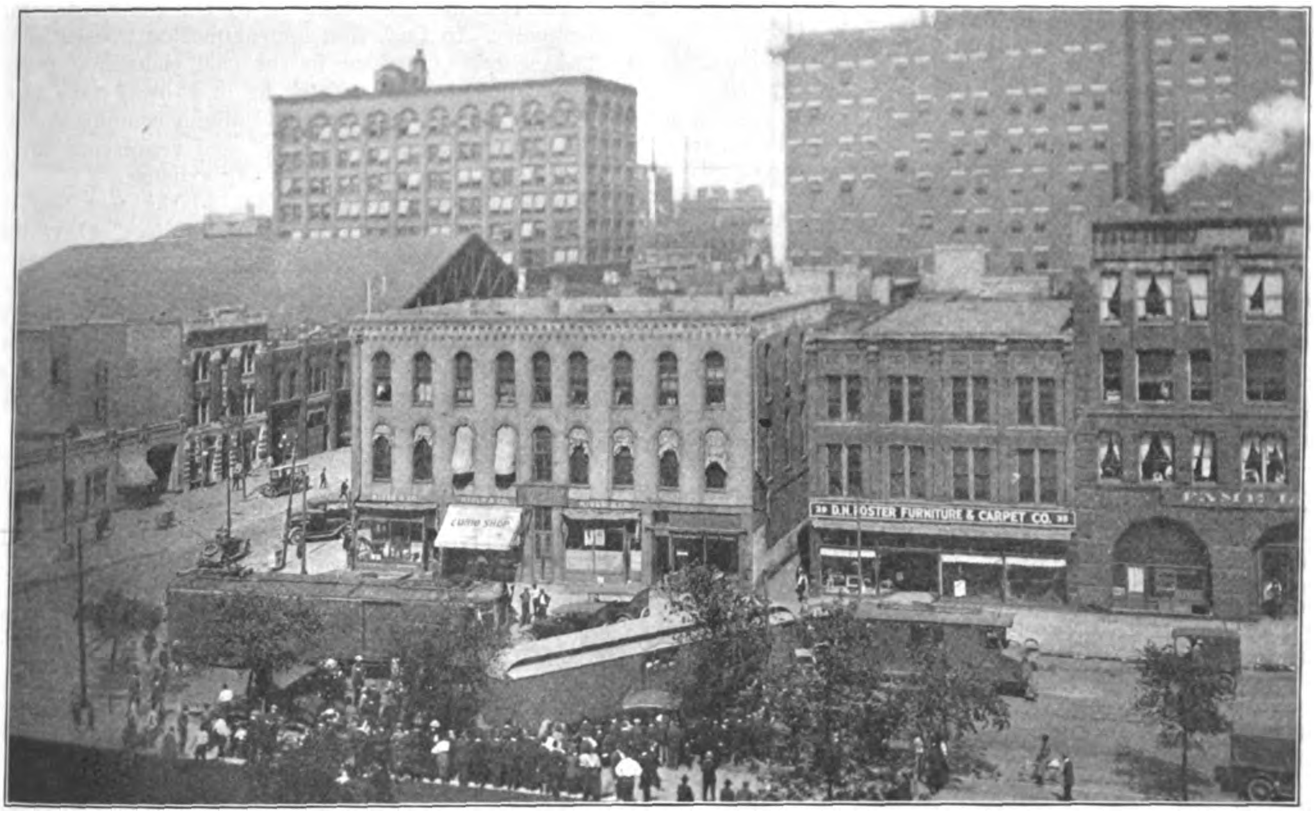
ACTIVITIES OF THE SERVICE DEPARTMENT

M. D. Atwater, director of service, has made greater use of photographs of service conditions throughout the state than is usually the case with other commissions. Enlarged photographs of accidents and bad construction have provided valuable evidence in hearings before the commission.

During the past year the following record has been made by this department:

Informal complaints closed	23
Cases adjusted	365
Plants inspected	120
Photographs taken for record	544

During the period of governmental control of the railroads it was not required by the commission that tariffs be filed as a matter of record by the railroads. Many such were furnished voluntarily, however, and since the return of the railroads to private control the back records have been completed in the files of the commission. Now no new tariffs may be put into effect without the approval of the commission.



PHOTOGRAPH EXHIBIT OF INTERURBAN WRECK DUE TO DEFERRED MAINTENANCE ON SPECIAL TRACKWORK, FORMING PART OF FILES OF COMMISSION

In general the increase of intrastate rates established by the Indiana commission are slightly less than the interstate rates founded by the Interstate Commerce Commission. It is believed by the Indiana commission that if it should increase intrastate rates to the extent of interstate values prayed for the discrimination in competitive territory vital to Indiana commercial interests would be increased over that which was pronounced unjust by the Railroad Administration under advice by the Interstate Commerce Commission. The Indiana commission believes that the intent of Congress in the transportation law was not to create a rate which would be discriminatory between states. Nor is it deemed likely that the transportation act meant to maintain exactly the same intrastate and interstate rates in a given district.

Electric interurban rates generally have been increased to the level of the steam railroads. Both steam and electric railroad systems have been heavily taxed to build highways at ever increasing expense. In the case of the interurban railroads, at least, the increasing freight business, which has been consistently developed, and a "policy of elimination of watered stock" adopted by the commission have contributed materially to save the situation from chaos.

RELATIVE IMPORTANCE OF STREET RAILWAY FARES

The seriousness of the problem of street and interurban railway fares is pointed out by Mr. Lewis in the address previously quoted. After noting the care and attention given by the Interstate Commerce Commission and by Congress to the adequate solution of the steam railroad rate schedule he emphasizes the fact that while the steam railroads transport approximately one billion persons annually the street railways transport fourteen or fifteen persons to every one carried by the steam roads.

Speaking of the Indianapolis conditions Mr. Lewis said:

> While the discovery of a place where one can actually buy 18 miles of riding for 5 cents is notable, it is not as remarkable as the discovery that the company is solvent and full of hope. Returning confidence in its future is indicated by higher bid prices for its securities. On July 1, 1920, there were 118 companies, with a total of 7,820 miles of track, in receivership. Since July 1 there have been a number of receiverships added to this depressing total. Other companies, some of which have exhausted possibilities of 8 and 10-cent fares, are showing hopeless tendencies. Fifty-six of those 118 receiverships occurred between June 1, 1919, and July 1, 1920. Obviously the departure from the 5-cent fare has not been a complete success. What can be more remarkable than the experience of a public utility commission having gentlemen who two years ago sat on the front steps bemoaning the denial of a 6-cent fare petition coming around and saying, "We need some temporary relief to get us past the exorbitant coal price era, but *we want to hold fast to this five-cent fare.*"

HIGH-VOLTAGE FEEDER OF MUNICIPAL LIGHTING COMPANY PASSES OVER CABLE BOX SEAT OF TELEPHONE COMPANY WITH CLEARANCE OF ONLY 6 IN.

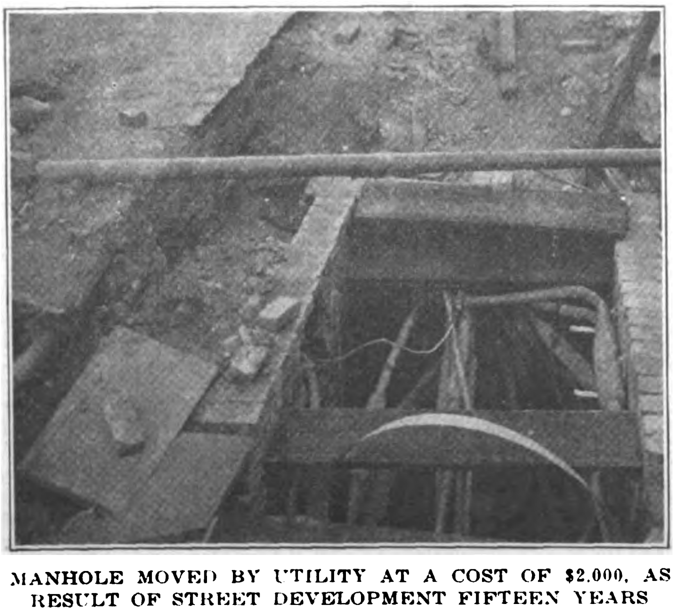
Five symptoms of the disease were diagnosed as follows:

1. The company was not collecting its earned revenues.
2. The value of petitioners' property did not warrant its financial obligations.
3. A sinking fund for the retirement of bonds with bonds was still drawing interest as well. Payments to the sinking fund, and payment of interest on bonds held in the sinking fund, were amounting annually to almost $200,000 of money that was badly needed for property and service.
4. Local social and industrial activity was not normal, due to the war, hence traffic was abnormal.
5. A superimposed holding and operating company.

The prescriptions issued included the following:

1. Elimination of unwarranted financial obligations.
2. Elimination of a holding company, and, incidentally, the elimination of absentee landlordism.
3. Awakening to the fact that the short haul passenger is the profitable passenger.
4. Collection of earned revenues, largely by the introduction of pay-as-you-enter cars.
5. Calculating the subnormal traffic during the war and correct forecasting of increased volume of traffic after 1918.
6. A healthy spirit of co-operation.
7. An intelligent handling of the whole situation by the city.
8. Better public relations.
9. After the financial structure is recast, and the face value of securities represent, and are warranted by, values of property put to public service, those financial obligations must be protected.

It may be asked why the popular remedy known by the "service-at-cost" label was not prescribed. The possible merits of this prescription in its many varied forms were very carefully studied and analyzed by representatives of the commission, the city and the railway corporation, all enthusiastic indorsers of the newly heralded panacea for all ills. After a thorough investigation of many of the systems in operation and the formulation of a new plan which seemed to eliminate many of the objectionable features of those already adopted, the whole proposition was tabled upon the initiative of the city in favor of other remedies previously noted.* It was felt, in brief, that incentive would be lacking and that increased costs of operation would be too readily accepted with the feeling that such burdens might be passed on to the public in the form of higher fares. "Service at cost," as ordinarily defined in practice, was therefore not recommended by the commission for Indianapolis. In fact, that approximation toward service-at-cost rates involved in the coal clauses of many light and power rates as well as in railway fare decisions has been avoided by the Indiana commission except in cases where the cost of coal represents but a small portion of the total operating expense.



MANHOLE MOVED BY UTILITY AT A COST OF $2,000, AS RESULT OF STREET DEVELOPMENT FIFTEEN YEARS AFTER INSTALLATION. ILLUSTRATION OF "SUPERSEDENCE"

The Indiana commission points to the fact that in cases of commission regulation of utilities, where the commission is really unbiased and in which it makes a careful study of valuations and operating costs and establishes a rate which provides for a reasonable return upon fair valuation over and above operating cost, depreciation and taxes, it really is putting in force a service-at-cost principle without the objectionable features as ordinarily administered by the utility.

The Indiana Public Service Commission, as in the case of several other state commissions, is just at present undergoing severe attacks in the Legislature, which is now in session. The outcome is, of course, problematical. As was said by one interested party recently, "We believe we must have been very nearly correct in our decisions, for we have critics in the ranks of both utilities and consumers." However that may be, the present Indiana commission has not suffered, apparently, from participation in politics and it has established conditions in most communities which will be recognized by the careful student of public service relations to be just and equitable.

Activities of the American Engineering Standards Committee

AMONG a number of specifications submitted to the American Engineering Standards Committee for approval, in accordance with the special provision in the procedure of the committee under which important standards in existence prior to 1920 may be approved without going through the regular process followed in new work, the American Society for Testing Materials has submitted several, including the standard method for sampling coal. The National Fire Protection Association has submitted the "National Electrical Code" for approval as an "American Standard." The Bureau of Mines has suggested, among others, its "specifications for storage battery locomotives—schedule 15—as a tentative American standard."

The Standards Committee has compiled a list of engineering standards of foreign countries, which are on file at the office of the committee, 29 West Thirty-ninth Street, New York City. They can be consulted there or photostatic copies can be furnished by the committee.

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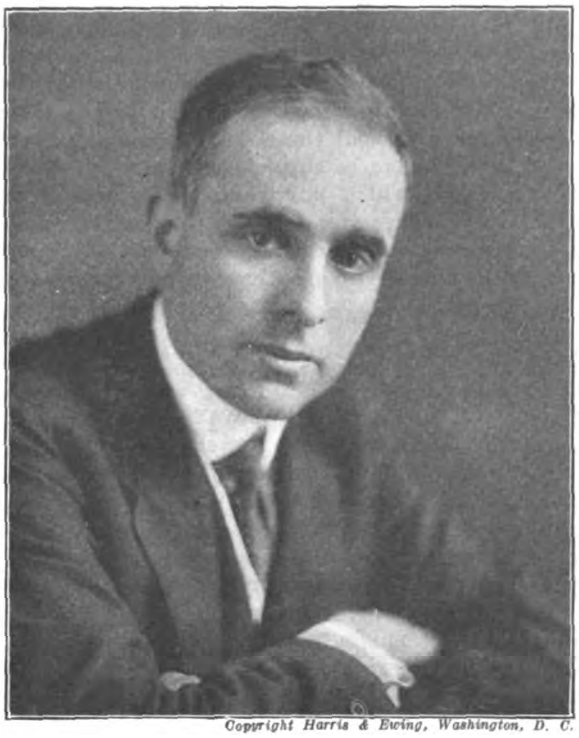
*See ELECTRIC RAILWAY JOURNAL, Nov. 13, 1920, page 1025.

This Is the Second of a Series of Articles on the Report of the Federal Electric Railways Commission, Written by a Commissioner

Will the Electric Railway Industry Respond to the Vision of Its Present-Day Leaders?

A Forward-Looking Policy by Electric Railway Companies Is Essential—The Public Will Insist Upon Receiving Adequate Service at Lowest Attainable Cost, Consistent with Highest Efficiency—To Gain Public Approval the Companies Must Eradicate Conditions Which Constitute Injustice to the Public Interest

BY LOUIS B. WEHLE
Formerly General Counsel of the War Finance Corporation;
Member of Federal Electric Railways Commission



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LOUIS B. WEHLE

IT SEEMS to me that the most favorable sign for the electric railway industry in the United States today is that, in its struggle against financial prostration and municipal ownership, it has turned for leadership to a traction man who is generally understood to be sympathetic toward the public's principal grounds for criticism. Mr. Gadsden, the new president of the American Electric Railway Association, has done more than sympathize with public critics of the industry. He has had enough statesmanship to co-operate with those critics and to interpret them plainly to his own economic group. His work in originating and pushing the idea of a Federal Electric Railways Commission, his labors on that commission, and his more recent public activities would justify us in characterizing him—using the term in its best sense—as a real political leader.

"JUST AND STABLE ARRANGEMENTS WITH A FRIENDLY PUBLIC"

Why is the leadership of the electric railway industry today in its essence a political leadership? Because the electric railway industry does an economic-social business—the people's business. In the long run the people will certainly impose upon the street railways, if they continue to use them, their purpose that those railways shall be run at the lowest attainable cost consistent with the best service to the city's social needs and consistent with the highest efficiency. That purpose they will impose through law. The man who is today guiding the policies of the electric railway industry is dealing with the thought of the public, has in mind necessarily the laws which can be framed by it to regulate his industry, and is, therefore, in a very certain sense a political leader. To borrow a phrase from the Federal Electric Railways Commission's report, Mr. Gadsden and his associates are concerned today by economic adjustments, essentially political, with improving the financial credit of the electric railways of the country *"through just and stable arrangements with a friendly public."*

The arrangements with the public must be just and they must be stable if the financial credit of the electric railway industry is now to be strengthened with any permanency. The winning of higher fares does not in itself furnish any real solution to the industry's long-range problem, because high fares cannot prevent—rather do they tend to stimulate—local public agitation which might quickly impair or destroy a company's credit. Nor does the introduction here and there of varying plans bearing the "service-at-cost" label solve the difficulties. The leaders within the industry itself, and within the separate traction systems all over the country, should quickly eliminate, wherever they exist, those deeply rooted evils which today remain as irritants to public opinion. It is not enough that those evils, frequently due to public as well as to private neglects in the past, will in due time under present or future laws be abolished by public service commissions. If the industry is really to be saved to its owners, they must, it seems to me, follow those few leaders in the industry who are courageously advocating a drastic housecleaning. Arrangements which are just will necessarily be stable because they will create a permanently friendly public, immune from the demagogue, upon whose laws and mental attitude long-term financial arrangements can with confidence be carried through under private ownership and management.

HOW CERTAIN LEADERS IN THE INDUSTRY WOULD CREATE A FRIENDLY PUBLIC

The question is whether the leadership of men like Mr. Gadsden and General Guy Tripp in the electric railway and allied industries is going to be seriously followed by the industry. These men see into the future. I think they see the heavy drift toward municipalization, and realize that real reforms within the industry, promptly and spontaneously made, can alone save it from engulfment in the experiment of public ownership, an engulfment in which the large and the small stockholders and bondholders, the owners of the property, may fare none too well at the hands of a public perhaps half informed or strongly prejudiced, and itself thus not capable of entire fairness.

In his testimony before the commission, at a time when prices were still moving up grade, General Tripp said in effect that the valuation of street railways for rate-making purposes should be made upon the basis of actual money which has gone into the property itself.

In the unanimous report of the commission, Mr. Gadsden and Mr. Beall, the latter a member of one of the largest investment banking firms concerned with traction investment, joined in expounding the seven following points, among others:

1. That "holding companies in many instances have been responsible for overcapitalization and have insisted upon drawing from the underlying companies every possible cent that could be secured, in order to make a showing on these inflated securities."

2. In many cities consolidations have resulted in underlying companies receiving guaranteed fixed returns which are excessive and "have greatly diminished the net operating revenue, and that there can be no satisfactory solution of the street railway problem in such communities until the system has been valued as a whole and the accounts so kept that the public may know that the rate of fare paid yields no more than a fair return on the value of such property."

3. The finding of the fair value of the property for rate-making purposes is a prerequisite for the permanent solution of the electric railway question. "The rapid increase in the cost of labor, supplies and material during and subsequent to the war period seems to have served as a peculiarly vivid indication that the original cost is a primary factor in finding value for rate-making purposes."

4. "The valuation, when once fixed as the basis for the financial return of the company, should logically come to affect the amount of capitalization. No matter what may be the plan of operation or of public regulation under which the company is working, if its financial credit is to be strengthened through just and stable arrangements with a friendly public, it should, in the judgment of this commission, voluntarily reduce any excessive capitalization to conform to such valuation as may have been determined upon."

5. "The electric railways should adopt the policy of setting aside a depreciation fund with which to take care of replacements and thus preserve the integrity of their investment. It would have a very wholesome effect upon credit. Such has not been the practice in the past."

6. Such rentals and power rates as would on investigation prove excessive should be reduced.

7. Serious co-operation should be effected in the protection and in the preservation of all corporate, financial and cost records with a view to their being available in connection with a fair valuation of the property. Without these data the public will tend to be suspicious of any appraisal which might be made, and "the failure of a company to preserve its records may in the end hurt its stockholders more than it may the public."

SELF-DECEPTION AND MUNICIPAL OWNERSHIP

The ELECTRIC RAILWAY JOURNAL circulates mostly in the electric railway family. The family is a place where there is generally plain talking, and I hope I may be pardoned if I do some plain talking here. In all candor, I ask whether the owners of the industry will now uphold these present public leaders of theirs and will now undertake seriously to follow the suggestions in the commission's report which have just been reviewed, or whether, by selective emphasis upon the features of that report which are more palatable, they will follow the illusory route of least resistance, the path of self-deception. Where is the sustained publicity within the industry for the ideas of voluntary reduction of excess capitalization, for valuation with original cost as a primary factor, or for reduction of excessive rail or power rentals? Where are the companies that are voluntarily undertaking to carry those ideas into effect?

Because of dangers incident to public ownership and management of street railways, I believe in trying to maintain them under private ownership and management, if private ownership and public service can be made compatible. Most of our city governments have failed so seriously and so often in smaller problems that it would be, indeed, optimistic to trust their average ability to succeed today with this formidable one. The experiment of private ownership must be given some further trial before I should be willing to see our American cities risk the dangers of political demoralization and of public inefficiency involved in public ownership and operation by their governments, as generally at present constituted; but if municipal ownership were to sweep the country tomorrow as a political epidemic, I should not be so concerned for the future of municipal government or of public urban transportation as I should be concerned by the reflection that a naturally indulgent American public has been forced to take away from this great American industry the ownership and operation of its own properties because its managers have been unable to handle its problems with sufficient fairness and ability to be allowed to hold them.

If those reforms which have been summarized above from the report of the Federal Electric Railways Commission should be applied spontaneously and persistently under the leadership of such men as seem now to be the public spokesmen of the electric railway industry, we may attain such a balance between private claim and public right as will prolong the life of the industry under private management. But if the public should, after such an effort at adjustment by the managements, still fail to receive adequate service at the lowest obtainable cost consistent with high efficiency, then municipal ownership would be the next logical step; and, if it comes at such a time, it would probably be effected with far less incidental injustice to the owners of the industry than would attend such a process of change today. Furthermore, if it comes under such conditions, it will be at least possible for us to know that it comes rather as the inevitable operation of a basic economic principle at work in connection with all public service than as a result of the inability of Americans to adjust their financial differences by dealing fairly with one another.

Summarizing the situation, I should say: Increases in fare have in many cases been, and in still other cases doubtless would be, justified. Much is to be expected from an honest and able administration of a well devised service-at-cost plan, if one can be evolved which will really insure efficiency. There are cities in which extensions of rapid transit and subway can be paid for, either wholly or in part, out of special assessments upon enhanced property values, so that the carfares can remain low and so allow the cities to avoid congestion, while at the same time securing justice to the old investors in the property. In many cities the companies are unfairly burdened with obligations to pave and maintain streets and way-bearing structures—burdens which go beyond what should be called for by the companies' proportionate use of the highways; and these injustices should be removed.

Furthermore, to the extent that the railway properties through comprehensive regulation and control come in the future to be public instrumentalities, instead of free means of private profit, they should be correspondingly relieved from property and franchise taxation until their contribution in taxes comes to be only enough to reimburse the city for its actual costs primarily referable to the presence of the street railway.

But these forms of relief for the companies and these changes in the technique of management or of regulation, approved in the commission's report, should, as was implied by the commission, not be attained, nor would their attainment permanently establish the credit of the industry as private enterprise, unless the managements in the industry will eradicate from it such conditions, where they exist, as now constitute injustice to the public interest, and will insure the public against future injustice.

It is a splendid challenge to American ability.

Transit Representatives Meet

The Association of Public Representatives of Urban Transit Hold a Conference at Cleveland at Which Various Topics Connected with Transportation Are Discussed, Particularly the Working Out of Service-at-Cost Contracts

AT THE call of President Culkins, the Public Representatives of Urban Transit met at the Hollenden House, Cleveland, on Tuesday, Jan. 25, to discuss intimately the problems that affect them—more particularly those that are arising in the working out of service-at-cost contracts. The meeting proved so interesting that the delegates were unable to accept the invitation of the Cleveland Railway to go over parts of its property. Those in attendance were the following: W. C. Culkins, Cincinnati; Charles R. Barnes, Rochester; Colonel J. L. Wickes, Baltimore; W. L. Sause, Youngstown; Judge Fielder Sanders, Cleveland—all of whom represent the cities named as street railway commissioners or directors; R. F. Kelker, Jr., Board of Supervising Engineers, Chicago Traction; Arthur F. Blaser, chief engineer to Judge Sanders; J. W. Leadley, manager Cleveland office Parsons, Klapp, Brinckerhoff & Douglas; Walter Jackson, Mount Vernon, N. Y., and a generous delegation from the Cleveland Railway, including J. J. Stanley, president, who acted as luncheon host; H. J. Davies, secretary and treasurer; Charles H. Clark, engineer maintenance-of-way, and Paul E. Wilson, assistant to the president. The presence of the Cleveland Railway men was particularly welcome because of their experiences with and viewpoint of service at cost based upon ten years of operation under the Tayler agreement.

THE RECENT FALL IN TRAFFIC OPERATING EXPENSES

The first subject taken up was that of recent reductions in riding and what means could be adopted to offset same, either in cutting costs or promoting voluntary traffic. Colonel Wickes noted that during the past month Baltimore travel had fallen 60,000 a day, chiefly in the movement to and from factories. Judge Sanders stated that Cleveland had already begun to cut off mileage on factory routes. Studies were also under way to do the same on residential lines. About two weeks were required to work up new schedules. At the end of 1920 daily car-miles were about 7.5 per cent in excess of the preceding year, but by Feb. 15 the standards of 1919 will be in force again. As to wages, there had already been a cut of 10 per cent in the case of the trackmen and shopmen, who are unorganized. The unionized platform men, however, have a contract good to May 1 unless they choose to accept a lower rate—possibly a reduction of 20 per cent. At luncheon Mr. Stanley said that Cleveland had begun by cutting the salaries of the general officers first.

Discussing Rochester traffic, Mr. Barnes reported that although factory travel had dropped as the result of a thirty-day to sixty-day shutdown, the shopping and pleasure traffic had not yet suffered in the same degree. Mr. Sause added that Youngstown had reached the point of cutting out trippers.

There followed a general discussion of operating and total costs, including accident expenses. Mr. Culkins mentioned the remarkably low figure of Cincinnati, approximately 2 per cent of revenue during recent months, compared with about 8 per cent in Cleveland. Mr. Kelker pointed out the value of co-operating with the National Safety Council.

THROUGH ROUTES OR TURNBACKS

There was a divergence of opinion on the age-old subject of turning back from or going through the congested delivery districts. Some held the opinion that the cars should be turned back outside the district and let the passengers walk several blocks if necessary. Others held that through service, particularly where the loads on opposite sides balance, was preferable. Nevertheless, two firm deductions could be drawn from this discussion:

First, the longer the through line the greater the distortion of headways and consequent impairment of service and waste of mileage.

Second, the lack of flexibility of single-end cars when turnback points have to be changed and there is an absence of sufficient loops.

PAY-LEAVE AND STREET COLLECTORS SPEED LOADING

Mr. Culkins said that partial pay-leave operation at Cincinnati had greatly relieved congestion even though the company had not taken advantage of this innovation to secure higher schedule speeds. Judge Sanders noted that in Cleveland the short riders had gradually acquired the habit of getting up to the farebox quickly instead of mauling their way through the whole length of the car when they wanted to get off. At one factory a man was stationed to sell the 1-cent transfers on the prepayment plan, thus speeding up pay-leave operation.

Percentage of Tickets Sold—Zone Fare Beginnings

With the present 6-cent cash and nine for 50-cents ticket fare 67 per cent of Cleveland fares are tickets. The highest Cleveland percentage, 92 per cent, was in the 3-cent days when tickets were sold five for 15 cents and the cash fare was either three pennies or 5 cents straight. Mr. Culkins reported that with 9-cent cash and 8½-cent tickets two to a strip the Cincinnati percentage was now 86 to 87 per cent; with 7-cent and 7½-cent fares it had been about 70 per cent. Rochester's four-strip ticket, said Mr. Barnes, covered 62 per cent of the rides. As for Chicago, the ticket percentage was negligible, said Mr. Kelker, although the cash fare on the surface lines is 7 cents while tickets are sold for 6.5 cents on the basis of ten for 65 cents and for 6 cents on the basis of fifty for $3. There seemed to be a fear of losing tickets which kept the public from buying them, and very few bought tickets in lots of $3.

Colonel Wickes brought up the question of what to do with annexed communities which lay claim to the prevailing flat fare. Judge Sanders observed that in Cleveland a beginning had been made in making the longer riders pay for the additional service. Southeast Cleveland was paying 8 cents and in the south end the fare was 5 plus 6 cents. Mr. Sause said that the village of Poland was now paying 5 cents in addition to the 9-cent fare in Youngstown itself. Not long ago, with the 8-cent fare in force, the Polanders were getting 8 miles, but they realized the injustice of paying no more than the people of Youngstown, whose ride was on the order of 3 miles.

Should Fares Begin to Go Down?

The need of electric railways for more revenue in contrast with the falling purchasing power of the street car user was naturally a matter of lively discussion. Mr. Stanley was most outspoken in his statement that he did not want to see the Cleveland fare go beyond 6 cents, although the balancing fund was rapidly diminishing. As the wages of the public were being cut it was essential that street railway men's wages would have to be cut too so that fares could be kept down instead of being forced up.

Mr. Stanley figured that the Cleveland system was carrying one and one-fourth times the population daily and that the average length of ride was 2.38 miles. Mr. Barnes placed Rochester's riding habit at practically unity.

One-Way Versus Two-Way Streets; No Parking

Colonel Wickes stated that because of the traffic saturation of certain Baltimore streets he had suggested to the railway that some streets be turned into one-way traffic for all vehicles, with one track reserved for local cars and the other for through cars. He had calculated that the express cars would attain 30 to 40 per cent greater speeds.

Mr. Kelker mentioned that Chicago was seriously considering an ordinance which would prohibit parking in an area of 1¼ x ⅞ miles. He had proposed the segregation of certain streets for vehicular traffic and of others for car traffic. Mr. Culkins brought up the desirability of sometimes giving up one track on one-way streets.

In Cleveland, said Judge Sanders, automobile parking on the loading side of Euclid Avenue—the great east-west thoroughfare—had been abolished up to Twenty-second Street during the rush hours. Because of the peculiarities of the street layout downtown automobilists would find one-way streets extremely annoying. For this reason the Cleveland Automobile Club opposed the idea. The club had made an elaborate study of traffic conditions in other cities, which study was available on application.

As regards the number of people served where automobiles are most plentiful, it appears that in both Chicago and Baltimore the average number of occupants per machine was only two. Therefore, there could be no question about their wasteful use of street space, whether running or parked.

Service-at-Cost and Revenue Experiences

From the intimate and highly valuable discussion which followed as to results with service-at-cost franchises it was obvious, as Mr. Culkins said, that the spirit of co-operation was more important than the letter of the contracts. In discussing fare increases made under the Cincinnati plan he said that every one-half-cent increase was supposed to bring $55,000 a month more, but actually the increase averaged but $18,000. The first fifteen days of January, 1921, excluding Jan. 1, compared with the first fifteen days of October, excluding Oct. 1, showed $200 a day less with 9-cent cash and 8.5-cent tickets than with 8 cents cash flat.

Cincinnati's allowance for administering service at cost is $17,000 per annum, and this comes out of the city's treasury. Rochester's $30,000 is an operating charge. Cleveland's $60,000 is also charged against the railway, but part of this covers checking services which the railway would require in any event.

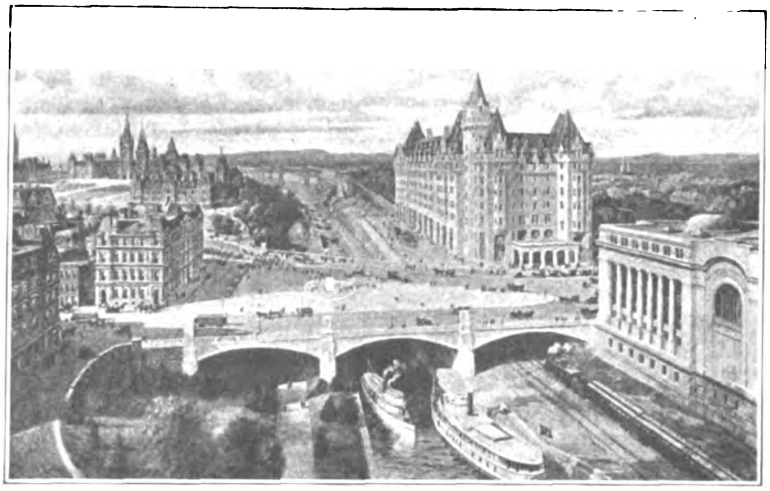
It was Mr. Sause's experience that the operating allowance per car-mile was one of the most troublesome features of existing service-at-cost contracts. Too often expediency had to govern in seeking alterations in allowances for a matter that actually cannot be calculated far ahead. Mr. Culkins believed that the budget systems of Boston and Cincinnati were an improvement in this respect. Mr. Barnes urged that greater stress be placed upon relieving the railways from city taxes, where feasible, in preference to increasing the fare.

A most instructive feature of the meeting was Mr. Davies' analysis of the forthcoming annual report of the Cleveland Railway, which embodies a review of ten years of the Tayler plan of service at cost. His analysis and answers to the questions raised were much appreciated.

On the lines of the Interborough Rapid Transit Company there are eight stations built on curves, so that there is a space between the car platform and the station platform. From 1911 to 1919, inclusive, there have been 5,559 claims for accidents due to the existence of this space, and in the settlement of these claims the Interborough Rapid Transit Company has paid $560,271.

Canadian Railway Men Meet at Ottawa

At Rousing Convention of Canadian Electric Railway Association Safety, Traffic Regulation, Safety Cars and Service at Cost Were Discussed—G. Gordon Gale of Hull Was Elected President



CIVIC CENTER OF OTTAWA, WITH PARLIAMENT BUILDINGS AND POST OFFICE AT LEFT, UNION STATION AT RIGHT, CONVENTION HEADQUARTERS AT RIGHT CENTER

THE seventeenth annual convention of the Canadian Electric Railway Association was held at the Château Laurier, Ottawa, Ont., on Jan. 31 and Feb. 1. The attendance was more than 100. Arthur Gaboury, president of the association, presided, assisted by G. Gordon Gale, vice-president. The opening address was one of welcome by Hon. Frank Plant, Mayor of Ottawa. He described some of the features characterizing the city as the capital of the Dominion and referred humorously to its desire for municipalization of the street railways as a sign of progressiveness, or, in the minds of some people, as a sign of over-progressiveness. He showed a spirit of real interest in the traction problem.

A. Eastman, Kingsville, Ont., acting honorary secretary-treasurer, read the minutes of the preceding convention, referring particularly to changes in the constitution and by-laws. After the reading of the president's address, Mr. Eastman also read his report as treasurer, showing the association to be in flourishing financial condition. He also tendered his resignation.

PRESIDENTIAL ADDRESS

In his presidential address Mr. Gaboury, superintendent Montreal Tramways, welcomed the delegates to the seventeenth annual convention of the association and said that for the first time in its history it had invited others than its own immediate members to attend. He was pleased, he said, to note representatives from the municipally owned railways as well as from industries closely allied with the electric railway business. He then explained that at the last annual meeting and at meetings of the executive committee it had been decided to enlarge the association to embrace all electric railways, and that it was the hope of the members to make the association second to none on the continent.

He then said that the industry during the past few years had been called upon to face the most critical test in its existence, and now is the moment when "united we stand, divided we fall" is more applicable than ever. He then referred to the papers which had been scheduled for presentation at the meeting, mentioning each individually, and gave an explanation of the reasons which led up to the preparation of his own paper, which, he said, was being presented through the courtesy of a committee of the American Electric Railway Association.

Traffic rules, he said, are above all necessary for the convenience of the traveling public and in consequence should help the quick movement of the street car and its passengers. In conclusion, he extended his thanks to the other officers and executive committee of the association for their co-operation during the year. Following the presentation of Mr. Gaboury's presidential address a nominating committee was appointed to report on Tuesday, as follows: W. J. Radford, Toronto; F. S. Livingston, Toronto; J. M. Ahearn, Ottawa; H. E. Weyman, Levis.

G. Gordon Gale then explained the changes, made and proposed, in the constitution and by-laws, caused mainly by the retirement last year of Acton Burrows from the post of honorary secretary-treasurer after fourteen years of service. There will now be an elected treasurer, a secretary to be appointed by the president and an auditor. There will, as before, be both honorary and active presidents and vice-presidents.

Mr. Gale then presented a set of "Proposed Rules for Installation and Maintenance of Electrical Supply and Signal Lines," prepared by the Hydro-Power Commission of Ontario and submitted for criticism. These were referred to a special committee to be appointed.

Mr. Eastman then read a large number of expressions of regret at inability to attend, showing improved interest in the meeting. He also reported that a number of manufacturers are joining the association, as they are privileged to do this year for the first time. These pay an annual fee of $50.

The question of providing for individual membership was also raised, there being some demand for this grade. After discussion the matter was left to the executive committee for appropriate action.

Monday Afternoon Session

In opening the afternoon session President Gaboury introduced H. H. Couzens of the Toronto Transportation Commission as a representative of the municipally owned lines. Mr. Couzens deplored the antagonism which exists between those who advocate respectively public and private ownership and operation. There should be, he said, no differences of opinion at any rate between the men who operate the properties.

D. M. Campbell, of Donald M. Campbell Company, car builders, was then called upon as a representative of the supply men. He expressed appreciation of the new relation of the supply interests to the C. E. R. A., and said that a meeting of their representatives would be held later in the day to make plans for future co-operation with the association.

A. B. Ingram of the Ontario Railway & Municipal Board then told of the work of this board, the rulings of which, he said, are not always popular. He stated further that there is a fine field ahead for the association and that the fact that the publicly owned roads are joining augurs well for the future. There must be "give and take" between the privately and publicly owned railways.

TABLE I—SHOWING FARES—MONTREAL TRAMWAYS

Period	Cash Fare (Cents)	Tickets Good 5 A.M. to Midnight	School Tickets Good 8 a m to 6 p m	Cash Fare After Midnight (Cents)
Feb. 9, 1918, to Oct. 3, 1918	5	6 for 25 cents 25 for $1 00 8 for 25 cents*	10 for 25 cents†	10
Oct. 3, 1918, to Oct. 26, 1919	6	5 for 25 cents 6 for 25 cents*	7 for 25 cents	15
Oct. 26, 1919, to Sept. 1, 1920	7	5 for 30 cents 44 for $2 50	7 for 25 cents	15
Sept. 1, 1920, to date	7	4 for 25 cents 50 for $3 00	7 for 25 cents	15

* These tickets were good between 5 a.m. and 8 a.m. and between 5 p.m and 7 p.m., Sunday excepted.
† These tickets were good from 5 a m to midnight, Sundays excepted.
Note: Strip tickets sold on cars. Book tickets sold only at offices of company.

MONTREAL SERVICE-AT-COST-PLAN

J. E. Hutcheson, general manager Montreal Tramways, then read a paper on the Montreal Tramways' service-at-cost contract, giving the results of two years' operation. He said in his introduction that the city of Montreal had increased in area from 9 square miles and a population of 216,000 in 1892 to 50.24 square miles and a population of 800,000 in 1917. During this time a number of small neighboring municipalities were annexed, and this brought demand for extensions and improved service from the tramways. As the city did not have a contract to call upon the company to build these extensions, negotiations were begun between the two, and in 1917 the Legislature appointed a commission of five to study the subject. This commission recommended service at cost, and a contract was made between the city and the company and became effective on Feb. 9, 1918, for a period of thirty-five years.*

TABLE II—COST OF SERVICE DURING DIFFERENT FARE PERIODS

	1st Period Feb. 10 to Sept. 30, 1918	2nd Period Oct. 1, 1918, to Oct. 31, 1919	3d Period Nov. 1, 1919, to Aug. 31, 1920	4th Period Sept. 1 to Nov. 30, 1920
Length of period (mos.)	7⅔	13	10	3
Passenger earnings	$4,771,662	$9,706,968	$9,303,154	$2,907,095
Gross earnings	4,873,931	9,892,525	9,491,085	2,988,859
Total charges	5,449,034	11,036,110	9,531,278	2,898,486
Balance	*$575,103	*$1,143,585	*$40,193	$90,373
Revenue passengers carried	116,571,723	201,919,820	159,030,043	47,741,940
Car earnings per passenger	4 09c	4 80c	5 85c	6 09c
Cost of service per passenger	4 68c	5 46c	5 99c	6 07c

* Deficit.

Since the adoption of the contract there have been three fare changes. Colonel Hutcheson then presented a series of tables from which the two that accompany this article were compiled, showing the fares charged during the four periods, passenger earnings, revenue passengers, car earnings per passenger in each period.

It will be seen that during the three months from Sept. 1 to Nov. 30 there has been a margin of revenue over expenses, although there is a considerable shortage resulting from previous operation at the lower rates of fare to be made up. It is hoped, general conditions permitting, that this shortage can be gradually made up without the necessity of any radical increase in the present rate of fare.

Supplementing the paper Colonel Hutcheson gave data showing the present distribution of the varieties of fares in Montreal. Only 3.74 per cent of the patrons pay cash; 76.21 per cent pay 6¼ cents (four tickets for a quarter); 17.7 per cent use 6-cent tickets; and 2.35 per cent use school tickets (seven for a quarter). He also exhibited diagrams showing the income and itemized expense by months over the service-at-cost period. He said also, in answer to a question, that the company is having difficulty in raising money, but that by paying much more for it than the rate allowed by the franchise the urgent requirements are being met.

The paper brought out a lively discussion in which the leading spirit was Dr. L. A. Herdt, vice-chairman Montreal Tramways Commission. He gave the point of view of the public with respect to the service-at-cost franchise, stating that the question is now public operation versus private operation under public control. He said that in Quebec there are no publicly operated railways, and traced the history of the commission, which serves as a means of co-operation between public and railway and permits the operation of the property by well-trained railway men.

Referring to Colonel Hutcheson's compilations he pointed out that in ten years the average actual fare in Montreal had increased from 4.03 to 5.62 cents, or 40 per cent; the revenue per car-mile from 29.8 to 47.1 cents, or 60 per cent, and the operating ratio from 56.2 to 75 per cent, while the net earnings for fixed charges decreased from 1.76 per car-mile to 1.4 cents, or 20 per cent. He said that under the present arrangement schedules are much more flexible than under earlier franchises, dead mileage has been cut down and schedule speed increased from 7 to 10 m.p.h.

Further the number of passengers per car-mile has been increased from seven to 8.7 per car-mile, and in January and February, 1921, the income has been 57 cents per car-mile. These results are possible because the cars are found where and when they are needed, and because there is co-operation between the railway and the commission. Conditions are met as they arise.

As to depreciation and maintenance, Dr. Herdt said that the property is maintained in good condition, which is equivalent to allowing for depreciation. In answer to a question as to the company's incentive to keep up the property, he pointed out the company owns the property, hence wants to maintain it. The operating bonus is an incentive to efficient operation because the company must keep within the operating allowance to obtain it.

The practical working out of the plan is seen in the fact that whereas the city of Montreal appealed to the Quebec Public Utilities Commission against the earlier fare increases, this was not done when the last raise was made. The city has learned to trust the Tramway Commission.

In closing the discussion, in answer to a question, Colonel Hutcheson said that the tramways employees feel that the rental paid to the city ought to go to them. He also commented upon the remarkable make-up of the Ottawa convention, comprising as it did representatives of municipal and provincial commissions, chiefs of police, supply men and other guests in addition to the railway men themselves.

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*The terms of this franchise were described in a paper read by Mr. Hutcheson at the 1919 convention of the American Railway Association (see Report Number ELECTRIC RAILWAY JOURNAL, Oct. 11, 1919, page 24).

The papers by Messrs. McCune and Weyman were then read by the authors, who illustrated them with lantern slides and motion pictures. Discussion was postponed to Tuesday.

WHY THE SAFETY CAR HAS SUCCEEDED

Mr. McCune prefaced his paper on the safety car by saying that the figures on this subject are of ample scope to enable a speaker to point out the numerous meritorious features which characterize safety-car operation and which have enabled rich financial returns to be obtained. Moreover, he can support his arguments with convincing data obtained from actual service in many cities. He defined as a "safety car" a car which is equipped with automatic laborless apparatus so interlocked that regardless of illness or distraction of the operator the power will be cut off instantaneously, the air brake and sander will be applied immediately thereafter and the doors will unlock for safe and easy exit of passengers.

Again, a car is a safety car only when the doors must be closed and the steps folded before it can start and when the air brake must be applied before the doors are opened and the step lowered in bringing the car to a service stop. This definition does not in itself specify the structural features of the car and does not preclude any car from becoming a safety car if the proper apparatus is applied. Mr. McCune said, however, that as the term "safety car" is generally used and as he used it in this paper it applies more especially to the car of the Birney type, which has been placed in service in large numbers within the past four years.

After describing briefly the general physical characteristics of the car, Mr. McCune said that at the end of 1916 there were some 400 safety cars in operation, and by the end of 1920 the number had increased to more than 3,000. This development was due to the following facts: About the time of the war the financial condition of the electric railway industry was impaired, due chiefly to the large use of the automobile, both by individuals and as a passenger-carrying bus. The situation was further complicated by the increases in cost of materials and labor. The effect was cumulative because the unprecedented increase in operating costs interfered with the securing of money for capital expenditures, thus managements were unable to make those improvements in service which would have resulted in an increase in the number of passengers carried. The situation thus resulting urgently required some relief, which was afforded in large measure by the adoption of the safety car.

Until it had been designed, the tendency in construction had been toward larger cars, the design of which was based primarily upon the necessities of rush-hour traffic. As early as 1914 it was recognized that the non-rush hour traffic constituted the larger part of the traffic of an electric railway, and that possibly an increase in net earnings would ensue if the car design applied more particularly to this class of service. Evidently the type of car especially suitable for this service is a small car of light weight. The savings possible then became immediately obvious. Moreover, it naturally followed that as the contemplated car would be small and light, it would be entirely practicable to entrust its operation to one operator, who would materially increase its earning power on account of the reduction in platform expense.

A SUMMARY OF SAFETY-CAR DATA

Mr. McCune then went on to explain the details of the air-brake and safety-car control equipment, after which he summarized the report of the safety car operation committee of the American Electric Railway Transportation & Traffic Association, presented at the October, 1920, convention. This report showed that there were in service or on order for delivery before Oct. 1, 3,750 safety cars, the total number of companies using these cars being 340. Of companies replying to a questionnaire sent out by the committee, four used safety cars in cities having a population in excess of 250,000, thirty-four used them in cities of less than 100,000 population and eleven used them in cities of from 100,000 to 250,000. The committee's report stated that in average cases of small cities or of lines in cities of any size where traffic is light or limited in amount, an average saving in operating expense could be effected by substituting safety cars, car for car, for existing two-man cars, of approximately 45 per cent in trainmen's wages, 30 per cent in maintenance of cars, 25 per cent in accident loss and 30 per cent in power cost. For the average system these savings aggregate about 20 per cent of the operating expense. No increase in gross earnings is expected in this case.

As to the rate of increase of purchases of safety cars, Mr. McCune said that in 1916 8 per cent of all city surface cars purchased were safety cars, in 1917 the figure was 20 per cent and in 1918, the last year for which he had statistics at hand, it was 40 per cent. Returning to the T. & T. Association report, he quoted the statement that in medium-sized cities, where base headways are between five and twenty minutes, it is almost universally the case that gross earnings can be materially increased by more frequent headways. For the companies reporting, an average of 40½ per cent increase was made in car frequency with safety cars, compared to former two-man cars, resulting in a reduction in gross earnings per car-mile of 0.93 per cent. The committee assumed a hypothetical case and from it derived an increase in net earnings of 7 cents per mile from a change from two-man cars to safety cars. Taking the case where there is no increase in headway, the saving per safety car per year based on 50,000 car-miles per year would be $2,500. Where the headway was increased the saving would be $4,500 per year.

In conclusion Mr. McCune said that the committee's report did not mention one feature which seemed to him of considerable importance, namely, the effect of safety cars upon capital expenditure. Where cars are purchased to give improved service by means of a reduction in headway, it is quite possible that the number of safety cars necessary will be no greater than the number of double-truck cars that would be required. In this case the expenditure will be considerably less, thus not only making it easier to purchase the cars originally but also reducing the interest charge. He then quoted from the report of the committee the following:

> In general, the committee concludes that the safety car merits the attention of the industries to a still greater extent than hitherto. Its growth in numbers in the past four years from 400 cars at the end of 1916 to 3,000 at the present time has been remarkable, and the committee feels warranted in predicting that its application will be still further expanded in the near future. Reports of its suc-

cessful operation and of its appreciation by the general public come from widely separated localities and justify the feeling that there are very few, if any, local questions affecting its adaptability. Its success, which may therefore be safely predicted, will be evidenced by lower operating costs and a lower operating ratio, more frequent service and increased satisfaction on the part of those who ride the cars.

ADAPTABILITY OF THE SAFETY CAR TO CANADIAN SEVERE WINTER CONDITIONS

A paper on the above subject was presented by H. E. Weyman, manager the Levis County Railway, Levis, Que., who said that the line is single track with turnouts or passing points, all on narrow streets and located on one side. The traffic is 20 per cent city and 80 per cent suburban, and there are three divisions, all radiating from the ferry landing, one going west to Quebec Bridge and two going east on the same line for three-quarters of a mile, then one turning, south, going uptown. Before reaching this junction point there is some 300 ft. of 13½ per cent grade, with two curves on it, and the main road crossing the track twice on the grade. This being a dangerous place when cars are following one another, they have to wait about 400 ft. from the grade until the one in front has negotiated it. The uptown line rises 300 ft. in 2 miles, with average grades of 6 per cent, the maximum being 11 per cent for 1,200 ft. The system has numerous curves; some say there is but 10 per cent tangent track. In addition to this the winter conditions are the most severe to be met anywhere, including very heavy snowstorms with high winds. Continuing, he said in part:

In winter the ferry is on half-hour service and in the rush hours this throws some 400 people at us each trip. To take care of this we put on extra safeties following the regular cars, called double-headers; these turn back at about half way on each division, leaving the regular car to run to the terminus. Formerly we operated double-truck, 40,000-lb., 140-hp. cars and no extras, and these, of course, operated all day and ran to the terminus. We also had some single-truck cars on our uptown line. Naturally the double-truck cars were responsible for very heavy peaks on the power system besides heavy maintenance of track and equipment. With the safeties we have lowered our peaks and cut everything else in half incidentally providing better accommodation and service.

We probably investigated this type of car and its characteristics more thoroughly than most companies do, especially as we were told repeatedly by both Canadian and American railway operators that it could not operate under our conditions. Finally we decided to stand by the principles of engineering and ordered twelve Birney cars, specially fitted up for our climatic conditions. These cars have been in operation twenty months now and prove to be equal, if not superior, under snow conditions to the double-truck cars previously used. Moreover, we no longer haul 140 hp., 40,000-lb. cars around for twenty hours per day, filled only for five or six hours per day. The safety has remarkable tractive effort, which, together with the quick acceleration, permits the car to operate better under bad rail conditions than any other car. This was demonstrated only this month when our double-truck freight car and the sweeper had trouble with the wheels spinning, while the safeties had no trouble. Some years ago we used, more or less, to permit our cars to buck the snow, with the result that our equipment was finally burnt out. After that we decided to fight the snow with snow equipment only and soon found we were much in pocket. Naturally we do the same with the safeties, and although they have once or twice bucked the snow without trouble we do not permit it to be done if avoidable.

Our railway system is by no means an ideal one to show what the safety cars can do, but their showing on the uptown line might be of interest. From the center of uptown to the ferry is three to five minutes' walk, up or down the cliff, while it takes the cars fifteen minutes to arrive at the same point, which they do by a circuitous route. In spite of two raises in fare to 10 cents cash, and tickets 7½ cents each, and no increase in the headway, although three safeties replaced four old cars, giving a little faster schedule speed, we average 25 per cent increase in revenue passengers. When we put the safeties into operation we put in force regular inspections at 1,500 miles, special inspections at 10,000 miles, when oiling and greasing are attended to, besides other work, and a yearly overhaul of everything. We also have a special accounting system, which gives us separate figures for new and old passenger equipment, snow equipment and details of the various apparatus comprising the car equipment. During a period of twenty months we have the following figures:

	Safety Cars, Cents per Car-Mile	Old Cars, Cents per Car-Mile
Car body and truck	0.873	4.08
Electrical equipment	0.154	2.34
Air equipment	0.133	0.63
Total	1.16	7.05

The figures for the safeties include certain expenses due to defects in the trucks, which have since been corrected by the car builders at their expense, and we no longer have this abnormal expense. Car inspection is included in both instances.

Some idea of the difference in costs of equipment parts can be gained from the following:

	Old Motor	Safety Car Motor
Armature coils	$40	$31
Set of field coils	178	57
Commutator	60	43
Armature complete	260	200
Gear case	30	21
Car wheel	15	10
Gear	57	40
Normal horsepower	42 (500 volt)	25 (600 volt)
Continuous capacity	30 amp.	35 amp.
Continuous tractive effort	330 lb.	600 lb.

Tuesday Morning Session

Vice-President G. Gordon Gale presided at the Tuesday morning session. The first matter taken up was a report from the supply men, presented by Mr. Campbell, who said that they had met, and endeavored to formulate plans for co-operation with the association. On the suggestion of A. Eastman, acting honorary secretary, it was decided to appoint a committee of three to co-operate with the executive committee. [The manufacturers later selected Mr. Campbell; H. T. Gibbs, Canadian Westinghouse Company, and O. C. Rehfuss, Canadian Steel Foundries.]

Discussion of Monday's safety-car papers was then proceeded with. H. L. Andrews, General Electric Company, gave a digest of data from a canvass made by his company, which showed the following cost data per car-mile as to safety and double-truck cars respectively: Maintenance of way, 1.6 and 3.3 cents; maintenance of equipment, 1.7 and 3.6 cents; power, 1.9 and 3.8 cents; transportation, 8.4 and 13.9 cents; general, 2.4 and 3.2 cents; total, 16 and 27.8 cents. The total saving averaged 43 per cent. Of thirty-seven companies reporting 25 per cent increase in gross receipts had resulted from 37 per cent increase in service. Accidents for the safety cars were 0.39 per 1,000 car-miles as compared with 0.59 for the larger cars. It was estimated that 3,500 safety cars are saving the industry $12,000,000 annually.

Mr. Gale asked as to the continued durability of the safety cars under Canadian climatic conditions. Messrs. McCune and Weyman replied that experience had shown them capable of standing up in severe weather, without increase in weight. Mr. Gibbs, speaking from the standpoints of both car rider and manufacturer said that in Toronto the reduced headway with the safety cars is greatly appreciated. Only a week's publicity was necessary to convince the patrons of the necessity for forming queues. [Here another speaker remarked that if a private company asked the patrons to form queues of the length sometimes reached in Toronto on the municipal lines there would be a vigorous protest]. There street men are used to sell tickets, collect fares at the rear door, dispatch cars and form queues. Pay-enter collection is employed at the front door. A recent estimate of the cost of equipping the present rolling-stock in London, Ont., with complete safety devices, showed that this cost could be wiped out in a year through the results which would follow.

C. C. Curtis, Cape Breton Electric Company, said that the standard Birney car, slightly modified for the very severe climate had operated well during the past two years on his property, as had also a couple of older cars equipped with safety devices. In Halifax, twenty-four cars bought a year ago and operated on the belt line have pleased everyone concerned.

Speaking as a car builder of long experience, Mr. Campbell referred to the alternating extremes of lightness and heaviness to which car designers have gone. He noted the increasing weights of the safety car designs and predicted a continuance of this tendency. He thought Americans rather inclined to fads and did not expect the Canadians to "fall for" the safety car so speedily. He said they are not a panacea for all railway ills, and in this Messrs. Curtis and McCune concurred, the latter stating that 1-man double-truck cars undoubtedly have a place. Mr. Andrews said, however, that the Ft. Worth, Tex., cars weighing 12,500 lb. had been operating for four years at a maintenance cost of 1.9 cents per car-mile. The average reduction in equipment maintenance expense is 51 per cent. Present cars weigh 16,000 lb. but there is a tendency to lower the weight by the use of stronger materials.

PUBLICITY AND PUBLIC RELATIONS

The paper on publicity, prepared by A. W. McLimont, vice-president and general manager Winnipeg Electric Railway, was read in the author's absence by Mr. Eastman.

Mr. McLimont, speaking of publicity methods, pointed out that he believed it the duty of every street railway manager to let the public know the facts about any phases of the street railway business on which information is desired: the company's problems should be laid before its patrons, as one business man presents a mutual problem to another, to obtain assistance in its solution; that the public should know the reasons why they are requested to pay an increased fare; that the railway as a vendor of transportation plays as important a part in society as any manufacturer, and that transportation must be sold even as a manufacturer sells his product. The public is square, he said, and once people are induced to think and talk about street railway problems, their opinion will become a powerful factor, and the civic authorities will then give the street railways a squarer deal.

The right public relation, he divided into five parts, namely (1) cleanliness of equipment; (2) keep faith with employees and treat them fair; (3) be truthful; (4) all members of the organization must be good community citizens and must be "boosters," always working for the public good whenever possible; (5) determine how best the railway can serve the public.

These rules require proper publicity, which can be accomplished by seeing that (1) any statements given out either to the public or the press are truthful; (2) practice what is preached because proper publicity and right public relations go hand in hand; (3) lay the problem of the industry before all who are interested if a square deal is to be eventually secured, so that where the public is told that revenues are inadequate and unfair taxes have to be met by the car rider, they will understand what is meant.

As a means of accomplishing this desirable relation the Winnipeg Electric Railway, he said, hired H. C. Howard as publicity agent on March 1, 1918, and charged him with the duty of establishing and maintaining friendly relations with newspaper editors and reporters through personal contact. It was also his duty to prepare briefs for presentation and distribution to interested persons and organizations, make up poster announcements for the cars, edit for publication every two weeks an official organ "The Public Service News" for distribution through "take one" boxes on the cars, and lay out newspaper advertisements.

Considerable progress has been made toward better newspaper relations and the close relations together with accurate and reliable news are appreciated and the papers generally treat the company fairly. "The Public Service News" now has a general circulation of 40,000, which includes a mailing list of about 1,000, and has proved a powerful influence in bettering public relations. This organ endeavors to put before the public the operating and other problems of the company.

Car window posters have also been used to announce charitable entertainments or special sporting or other events in which the railway is interested as well as a series of drawings regarding the "jay walker" and other safety first matters.

Mr. McLimont believed that newspaper advertisements properly written and attractively set up, although expensive, afforded the best medium for reaching the members of a community. As an instance of this he outlined the plan recently followed when the city of Winnipeg attempted to start court action to upset the act of the Manitoba Public Utilities Commission increasing fares. This campaign so influenced local public opinion that the Mayor for 1921 was elected on a platform favoring round table discussion of the street railway problem instead of litigation. Even before election the mayoralty candidate made it clear that he favored granting the street railway a fare that would insure adequate wages to employees and enable it to procure necessary working capital.

The success which has been attained through publicity, he said, is not however fully explained unless mention is made of the weekly meetings of the heads of departments. At these meetings everybody is made to feel as free from restraint as possible, so that frank discussion can be held of the difficulties that occur in the various departments. These meetings have brought better co-operation among departments through the men becoming better acquainted personally and more or less familiar with the workings of outside departments. It is large through such means that the Winnipeg company was able to increase its fares three times in the past two years and to have the jitney competition which seriously threatened to upset the whole railway operation, abolished. Moreover, there has been no disagreement with the employees of sufficient importance to warrant a strike; the only strikes which have occurred were in sympathy with outside workers and were not entered into through disagreement with the company.

In closing his paper Mr. McLimont said he was not pessimistic of what the future has in store, for he believed that proper publicity coupled with a sincere desire to give efficient service would prevent the railway industry from going to the graveyard where obsolete and bankrupt transportation systems rust.

DISCUSSION ON PUBLICITY

The discussion was opened by Major F. D. Burpee, manager Ottawa Electric Railway. He referred to good public relations as the panacea for the troubles of the electric railway, in other words to the essentiality of good-will. Good advertising is the best means for inaugurating new ideas. In the past the public has been hostile to the electric railway on the assumption that the public was the "under dog." The facts must be presented, and in doing this the employees must play an important part.

Referring to Mr. McLimont's rather elaborate program Major Burpee said that all cannot do as much as this but all can do something. He then described the practices of the local company in furnishing employees with a periodical and also supplying the public with weekly leaflets. Several other speakers discussed the characteristics of good publicity, H. H. Couzens, Toronto Transportation Commission, stating that leaflets with special motives behind them are apt not to be successful. If the company can show the public that it wants to be fair the "thing can get over." The man in the street understands little of the railway business which must be explained to him from the ground up. The public judges the railway by its employees who must be carefully trained.

ACCIDENT PREVENTION IS EVERYBODY'S BUSINESS

The next paper, on accident prevention, was read by the author, R. Mayne-Reade, superintendent Quebec Railway, Light & Power Company.

Mr. Mayne-Reade in introducing his subject of safety first said that accident prevention is a duty of Christian honor not only because it seeks to save life and money and promote efficiency, but because it stimulates the fundamental spiritual idea of better human co-operation. The effort and money already spent on the safety first movement and the work of the National Safety Council, the Red Cross and other kindred organizations should have educated every man, woman, child, public utility and industrial corporation to understand that the gospel of self-preservation has become an established order in the routine of our daily life. Yet the newspapers show an appalling high toll of accidents.

It must be admitted that some progress has been made though there is an indifferent attitude, even among educated business men toward the principles of safety first. With railway employees the subject sought has been to make the men realize that safety first is just as important to them as to their employer and to the community at any work they undertake, but experience has shown that owing to man's tendency to exercise what he calls personal liberty it is imperative that education and discipline must go hand in hand. Co-operation has been effected with municipal councils, public authorities, automobile clubs and individual owners of automobiles in the interests of safety. Rolling stock has been equipped with the latest safety devices and compensation laws have been enacted by the legislatures.

Ten years ago the steam railroads headed the list in the number of fatal accidents. Today it is the automobile that heads that list. This fact assuredly indicates that there is something radically wrong in the administration and regulation of the traffic laws. The missing statute is the drivers' license law providing for the mental and physical examination of applicants before licenses are granted to drive a car. In a city where the traffic laws are inadequate and where enforcement is unfair, the motorist or driver with influence can escape punishment and citizens do not take seriously the police or court and readily blame the traction companies for any kind of a collision with a street car. Often also they procure doubtful witnesses to substantiate their alleged claims, thereby increasing the financial burdens of the utilities. This class of drivers as well as the beginner and physically incompetent will be reached through the enactment of a driver's license law.

Every careful competent driver and all pedestrians should welcome such a law. Motormen would also come under the same requirements. The law should not only set the penalty, but require the judge to assess it on proof of guilt, and the penalty should be jail instead of a fine. Every city should have its own traffic court, so that more individual attention could be given to traffic problems.

Mr. Mayne-Reade also suggested that inasmuch as the government spent large amounts of money during the war for publicity to enlist men for army and raising of funds, it should enact a law calling on publishers of periodicals voluntarily to devote a definite amount of their space to accident prevention matter. He also suggested that every theater curtain, program, etc., as well as every business card, letterhead and postage stamp should carry the safety message; further, that provincial governments should add a safety section to their education department and that electric railways as a part of their safety campaign have an exhibit during their annual exhibition on both traffic and public safety.

MR. MORLEY DESCRIBES ONTARIO SAFETY WORK

H. B. Morley, general manager Ontario Safety League, who followed Mr. Mayne-Read, said that he could not see any just cause for pessimism in regard to the safety movement. Accident prevention, he said, is scarcely "news," but an accident is "news" and receives wide publicity. Each accident reported, however, acts as propaganda in the fight against other accidents and so the world will continue to learn by the mistakes of others. It is said that an accident is "an unexpected event, a mishap" but accidents do not happen, they are caused—the result of carelessness or thoughtlessness. This is why the lesson of the safety movement is prevention. Figures prove that some of the large industries have reduced accidents in their plants, 20, 25, 40, 50 and 60 per cent. The United States Steel Corporation estimates that during its last eight years of safety work it has saved 25,863 workers from serious injury and death. This is not theory or expectation; it is a cold fact of one industry.

The Ontario Safety League was organized on Jan. 1, 1914, with an executive committee composed of representatives from various bodies likely to be interested in this work and has grown rapidly. The keynote of its campaign has been the education of the rising generation, with the thought that children taught to be careful on the street and in the home will develop into careful men and women and through the pupils in the schools, lessons in prevention will be carried into thousands of homes. The League issues every fortnight thousands of bulletins for shop posting, dealing with accident and fire prevention. For six years it has conducted for the Ontario Motor League an annual prize competition on compositions about motor accidents among pupils of the schools. Addresses are also made in the schools and in all nearly 65,000 pupils in over 1,300 classrooms have been reached. Safety buttons, bulletins, blotters, pamphlets, "letters to parents" and motion pictures have been used with success. In addition, safety patrols have been organized.

A special series of electric railway bulletins prepared by a special committee is issued regularly. Through the Department of Highways for the Province, safety rules were given out with each automobile license in 1918, 1919 and 1920. A Canadian safety convention was held last year. This year a "safety week" in Ontario was conducted from Oct. 10-16. Sub-committees covered such subjects as publicity, motion pictures, bulletins, boy scouts, traffic, schools and colleges. It was a success, with notable accident reductions.

The electric railway can afford to be a big contributor to efficient safety work as it cannot conduct a safety campaign as successfully as can a citizens' committee. Accident problems are due almost entirely to: (1) Persons boarding or leaving cars, (2) collisions between cars or between cars and other vehicles; (3) accidents to pedestrians. Each can be reduced by safety education.

Safety education, as far as the electric railways and all other industries are concerned, must start at the top. The "Big Boss" must be sincere. The campaign also must be thorough. The great difficulty today is that we are "pikers" when it comes to spending money on accident prevention. A company may pay out $100,000 in accident claims yet shrink from an expenditure of $10,000 on prevention. As regards automobiles, every driver should have a license, given only after examination. This is the greatest piece of traffic safety legislation that could be passed today.

TRAFFIC REGULATIONS

In his paper on traffic regulations, which was read by title, President Gaboury gave an account of the work during 1919 and 1920 of the committee on code of traffic principles of the American Electric Railway Transportation and Traffic Association. Mr. Gaboury has been a member for both of these for years. The traffic rules which he then presented for adoption by the Canadian Association, he said, were identical with those presented to the National Traffic Officers of America and the same as approved by the Transportation & Traffic Association at its 1920 Atlantic City Convention except for a few minor changes to render them more adaptable to Canadian cities. Mr. Gaboury appended to these rules a statement on courtesy and safety commandments. The latter follow:

Safety Commandments

Be Considerate
Be liberal towards others using the street.

Go Slow
Approaching children. They do the unexpected thing.
Passing vehicles.
Around corners.
Approaching cross walks.

Stop
Behind street cars taking on or discharging passengers.

Look Ahead
And keep on the alert for intersecting traffic.
Use tire chains on wet and slippery pavements.
Better be careful than sorry.

Safety Don'ts

Don't run fast into or across main highways.
Don't take blind curves too fast.
Don't forget that a car or a person may be just around the turn.
Don't pass street cars when passengers are boarding or leaving.
Don't forget that the other driver may be reckless or drunk.
Don't fail to look out for pedestrians.
Don't forget that children dash out suddenly and unexpectedly.
Don't take chances.
Don't drive into an uncertainty.

RESULTS OF THE ELECTION

President Gaboury resumed the chair at the close of the session and read the report of the nominating committee which was approved and the following were declared elected: Honorary president, T. A. Ahearn, president Ottawa Electric Railway; honorary vice-president, George Kidd, general manager British Columbia Electric Railway; president G. Gordon Gale, vice-president and general manager Hull Electric Company; vice-president, Major F. D. Burpee, Ottawa Electric Railway; members executive committee, R. M. Reede, superintendent city division Quebec Railway, Light & Power Company; H. H. Couzens, Toronto Transportation Commission; Edward P. Coleman, general manager Dominion Power & Transmission Company, Ltd., Hamilton; C. C. Curtis, local manager Cape Breton Electric Company, Sydney; C. L. Wilson, assistant manager Toronto & York Radial Railway, Toronto; A. W. McLimont, vice-president and general manager Winnipeg Electric Railway; treasurer, A. Gaboury, superintendent Montreal Tramways; auditor, H. E. Weyman, general manager Levis County Railway, Levis.

In closing the convention Mr. Gaboury turned the chair over to his successor, Mr. Gale, who spoke briefly and then called on John Murphy, Board of Railway Commissioners & Department of Railways & Canals, who complimented the convention on the splendid meeting and expressed his best wishes.

ENTERTAINMENT FEATURES

During the meeting informal get-together luncheons were held with excellent results in "breaking the ice," and on Monday evening there was a banquet at the Royal Ottawa Golf Club, Hull. As Hull is in Quebec a more comprehensive menu was possible for the dinner than on the Ontario side of the Ottawa River.

Colonel Hutcheson acted as toastmaster and in opening he proposed a toast to the King, which was received with enthusiasm. He then referred to his former long residence in Ottawa with appreciation, and called upon

Mr. Gaboury to propose a toast to the city. The latter was followed by Hon. Frank Plant, Mayor of Ottawa, who gave details of the scenic beauties of the city, its educational facilities and the Parliament buildings. He also expressed appreciation of its railway system.

T. Ahearn, president Ottawa Electric Railway, proposed a toast to the association, tracing briefly its history and referring to the early days of the local railway. Just thirty years before he had employed J. E. Hutcheson on the property and he said that great credit is due to the Colonel for the development of the property. Mr. Gale, vice-president of the association, responded, outlining the plans of the executive committee for the coming year.

Acton Burrows, honorary vice-president, was asked to propose a toast to "Our Guests," which he did with many witty sallies. Three guests responded to this toast, H. H. Couzens, for the commission representatives; Capt. Emilio Trudel, Chief of Police of Quebec, for the police department, and O. C. Rehfuss for the supply men. Mr. Couzens told briefly what in principle the Toronto Transportation Commission plans to do; Captain Trudel apotheosized Quebec and urged that the 1921 convention be held there, and Mr. Rehfuss outlined the labor shortage problem from the standpoint of the manufacturer.

The last toast was to the press, proposed by Major F. D. Burpee and responded to by H. H. Norris, managing editor ELECTRIC RAILWAY JOURNAL, and E. W. Harrold, city editor Ottawa *Citizen*. Major Burdick expressed the debt of the industry to the press, while the editors explained the relation of their profession to the electric railway. During the dinner the guests were entertained by vocal and instrumental music of very high grade.

Before the meeting broke up Mr. Gaboury paid a tribute to the toastmaster, who responded by telling how he had endeavored to build up the Montreal property, which had only been possible through the co-operation of Mr. Gaboury, Mr. Blair, Mr. Graves, Mr. Bird and their associates.

On Tuesday afternoon the convention attendants visited the Ottawa Car Manufacturing Company's works to inspect its new safety cars, and the shops of the local company. Some also went through the new Parliament buildings.

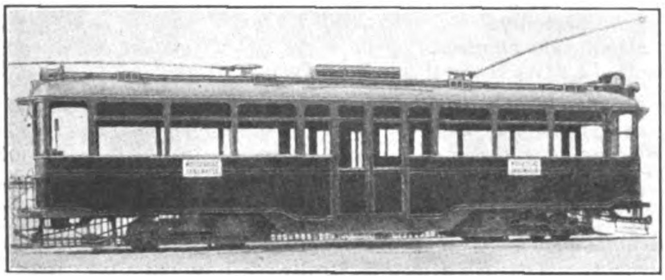
New Motor Cars and Trailers for Geneva

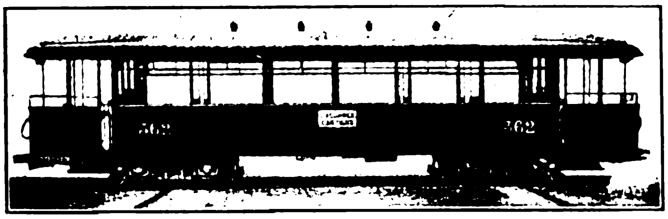
Swiss Tramway Will Try Cars of Types Novel to Them—Trailer Was Designed for Lightness and Smooth Riding Qualities—Electric Braking a Feature of Motor Car

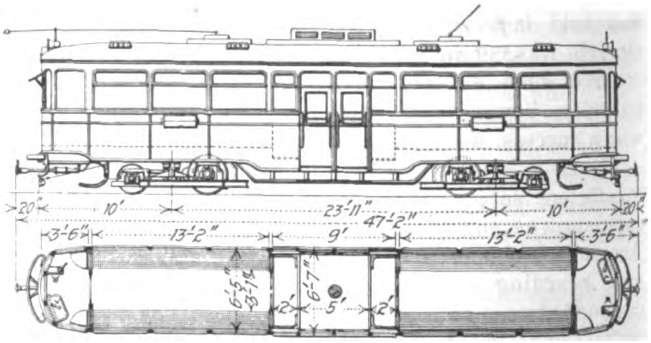
TWO years or more ago the Geneva (Switzerland) Electric Tramways Company ordered from local manufacturers twenty motor cars (ten single-truck and ten double-truck) and ten double-truck trailers. These are now nearly if not quite all delivered. As the cars differ in some respects from the types popular in this country and as they may be assumed to be typical of the latest tramway rolling-stock ideas on the Continent the following facts regarding the two double-truck types are given, based on an article in *Schweizerische Bauzeitung* for Nov. 27, 1920.

The motor car is of the center-entrance and exit type, which is uncommon in Switzerland. The body is of steel and it is divided into five compartments, separated by bulkheads with sliding doors. The central section contains a well extending across the body, with a step each to the forward and aft main compartments. This vestibule will accommodate eighteen persons standing. The main sections contain longitudinal seats, each section seating eighteen. At the extremities of the body are the motorman's compartments, the forward one being closed off in operation, while the rear one is left open to increase the carrying capacity.

The car is mounted on maximum-traction trucks and is driven by two 50-hp. motors, with a 5.42 to 1 gear ratio. The motor is equipped with ball bearings. The car length over buffers is 47 ft. 3 in. and its weight, empty, is about 22 tons. It is provided with air brakes and with positions on the controller for producing electric braking also. The starting resistors are mounted centrally on the roof.







NEW MOTOR CAR AND TRAILER FOR GENEVA, SWITZERLAND
Above at left, motor car; below at left, trailer; at right, plan and elevation of motor car

The trailers are of a new type, designed for use on suburban lines to have a large capacity (thirty-four seats and thirty standing places plus fifteen on each platform). The over-all length is 42 ft. 7 in. and the weight, empty, is 11.6 tons. Like the motor car, the body is of steel construction. Special attention was given, in the design of the trailer trucks, to the producing of easy-riding qualities. This was accomplished through the use of lateral leaf and helical springs.

The Central Electric Railway Accountants' Association, at its recent convention at Dayton, Ohio, was entertained at luncheon by the Ohmer Fare Register Company. The twenty-five or more members in attendance stopped en route to the factory for a brief reception at the home of John F. Ohmer. The same hosts also provided theater parties for the evening.

Opinions Regarding Indorsement by the Association of Reports of Federal Electric Railways Commission and of Chamber of Commerce Committee

The Chairman of the Publicity Committee of the Association Urges Indorsement by Industry of Broad Findings of Commission—Views Are Expressed by Executives in Texas and Ohio—B. C. Cobb Gives the Views of a "Car Rider"

THE program for the Chicago conference on Feb. 10 shows that the afternoon session is to be devoted to the consideration of the report of the Federal Electric Railways Commission and the report of the special committee on public utilities of the Chamber of Commerce of the United States. President Gadsden in a special letter to member companies has urged the association to take action with respect to the conclusions and recommendations contained in these reports and has expressed his opinion that nothing that the association can do will be more helpful than to place itself squarely upon record before the public in this matter. Mr. Gadsden personally is on record as believing that the industry should make a public announcement that it accepts these reports in principle.

Last week's issue contained expressions of opinion on this subject from the chairman of the Committee of One Hundred, two railway executives and one public utility commissioner. Views from several others appear below.

⁂

Barron Collier, chairman of the committee on publicity of the American Electric Railway Association, says:

"As an advertising man who is vitally interested in creating public good will for the electric railway industry, I hope that the American Electric Railway Association will indorse the broad general principles of the reports of the Federal Electric Railways Commission and the Chamber of Commerce of the United States.

"These reports contain very helpful material for electric railway operators, and I believe that the broad findings of the commission are such as to warrant their indorsement by the industry.

"My particular interest in seeing the reports indorsed is that of again carrying to the public conviction of our honesty of purpose. At the outset of these hearings we told the public and the press that we were anxious to have a fair and impartial investigation of our case and that we were willing to stand on the findings of any fair jury. We were extremely fortunate in obtaining the services of men of the highest character on both the federal commission and the Chamber of Commerce committee, and I think it can be truthfully said that they made very full inquiries and, in their judgment, rendered fair reports.

"Meantime the press and public, convinced of our sincerity in urging these investigations, followed the activities of both the commission and the committee with sympathetic interest. It now behooves us to reassure the public that we were sincere in our expressed desire for an impartial investigation of the industry."

COL. J. F. STRICKLAND *is president of the Dallas Railway and a member of the Committee of One Hundred. He has taken an active part in the development of electric railways in Texas and writes under date of Jan. 27:*

"Referring to the article on page 136 of the issue of Jan. 15, headed: 'Consideration of Federal Report Urgent,' in which reference is made to the letter recently sent out to all executives of member companies of the American Electric Railway Association by President P. H. Gadsden, I am struck with the importance of some decisive handling of the matter by the association at its midwinter meeting in Chicago in February.

"I am thoroughly in accord with most of the conclusions reached by the Federal Electric Railways Commission and also by the special committee of the Chamber of Commerce of the United States, and I feel that it is up to the executives of street railways forcibly to bring to the attention of the public the findings of these two important bodies. If we do not avail ourselves of the opportunity of bringing to public notice in every way possible the present status of the street railway business as set forth in these reports we are certainly unmindful of the great effort, as well as the time and money, expended in developing for public information the complete story of street railway operations.

"I trust, therefore, that the association at its meeting in February will recognize the importance of the matter and will accordingly go on record in no unmistakable way."

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NORMAN McD. CRAWFORD, *vice-president and treasurer of the Columbus Railway, Power & Light Company, Columbus, Ohio, was another member of the Committee of One Hundred who was asked to give his views on the subject. Mr. Crawford said:*

"I regret that I must plead guilty of at least one fault pointed out so forcefully and clearly in the interview with President Gadsden, recently published in your journal, and I confess that personally I have treated as of local importance only many of our problems which should have been recognized as of interest to the industry as a whole.

"In the short time allowed me, I have not been able thoroughly to consider the findings reached and the recommendations made by the report of the Federal Electric Railways Commission and the public utilities committee of the United States Chamber of Commerce. I have, however, abiding confidence in the personnel of the committee appointed by President Gadsden to report its recommendations relating to the reports above mentioned, and I feel that as suggested the electric railway interests of the United States will be advanced and broadened not only from the viewpoint of the industry but also from the viewpoint of the public at large who are our patrons if the association at its midwinter meeting treats this problem fearlessly, fairly, frankly.

"It is axiomatic that adequate electric railway service is a public convenience and necessity, and because it holds the most important and constructive relation to the best interests and upbuilding of the community this form of transportation should not be discontinued or impaired. It is also axiomatic that unless the public authorities allow such reasonable return upon the investment as will attract capital and provide for the continuance of the service operation in such cases must cease. In cases of discontinuance transportation could only be provided by the questionable method of municipal control, which has recently (particularly in the case of Seattle) proved itself to be such an utter failure. It would then appear that the public ultimately pays for adequate transportation, whether by means of increased fares or by means of increased taxation, in cases where the operation is taken over and conducted by the method of municipal control.

"Personally I do not have the fullest confidence in the remedy applied by a service-at-cost method, although in many instances this method has provided at least temporary relief for the operating company. It is therefore to be hoped that full and frank discussion of the reports, as suggested by President Gadsden, may result in a united effort which should undoubtedly tend to solve the problems in hand."

◆

JOHN J. STANLEY, *president Cleveland Railway and past-president American Electric Railway Association, is strongly for indorsement. His position is defined in the following statement:*

"Whatever the objections of our member companies to any of the opinions and conclusions in the reports of the Federal Electric Railways Commission and the special committee of the Chamber of Commerce of the United States, indorsement by the Association of these reports would define the attitude of our industry toward the public and itself as no purely local discussion can define it. Personally, I feel that such action taken by the association cannot be but wise, even though it creates some inconsistencies in the positions of some member companies. I do not fear the latter.

"The great need of the public utilities as I see it is a removal of the distrust, dislike and disinterest which exist with so many of our customers. If endorsement of these reports will help change this attitude of the public we serve I am for indorsement, being more concerned with the remedy than with its application."

THE American Institute of Electrical Engineers has been designated as sponsor for the rating of electrical machinery by the American Engineering Standards Committee, and the responsibility for the work has already been officially accepted by the Institute. A sectional committee has been formed, which is rapidly pushing the work so as to prepare for the next meeting of the rating committee of the International Electrotechnical Commission, at which the fundamental basis of rating will be discussed. At the last meeting of the rating committee, held in Brussels in March, 1920, the American delegates presented a proposal for a system of rating based upon the "hot-spot" principle.

A Car Rider's Reply

Readjustment of Securities to Accord with the Value of Company's Property Would Not Only Often Inflict a Great Hardship on Stockholders but Would Accomplish No Useful Purpose

By B. C. COBB
Vice-President Hodenpyl, Hardy & Company, Inc.

I LIVE in a large city, am engaged in business and am a car rider. My office is located several miles from my home, and it is almost always my daily habit to ride to and from my office on the cars, usually during the morning and evening rush hours. My opportunity therefore for observing transportation problems along with car riders' demands and complaints has been quite considerable.

I went to work at the age of eighteen. My first job was with a transportation company. I continued in this line of work for several years and became acquainted to some extent with the many difficult operating and financial problems with which most transportation companies have to contend. Perhaps my views at that time were biased, perhaps I was all too sympathetic with the trials and burdens of the company, and perhaps I was at times unmindful of the public and its desire to be served. I could not, however, have erred to any great extent, for our chief was a stickler for good service and a martinet in discipline. He believed in a fair service for a fair charge; he believed in a fair wage for a fair day's work; he expected to pay and expected to receive; he believed in fair pay for a satisfactory service rendered. One thing he always preached, and that was that a property is entitled to a compensatory return on the investment necessary to render service, *i.e.*, a fair return on a fair valuation.

I remained in the transportation business for some years, only leaving the service because I thought I saw greater opportunity for advancement and the acquirement of worldly possessions in other lines of business. I have, however, retained my love for transportation work, which most railway men do, and I have always been interested in transportation problems.

I was therefore much interested the other day in reading in the ELECTRIC RAILWAY JOURNAL of Jan. 1 an interview with Philip H. Gadsden under the caption "Ask the Car Rider." It was a very good article in many ways and I think Mr. Gadsden's thought was and is to impress the public with the dire necessities of the street railway industry and the importance of re-establishing its credit in order to be able to continue serving.

I commend Mr. Gadsden's views in these particulars and I agree with him that unless the credit of the electric railway industry is re-established it cannot continue. I do not, however, agree with some of Mr. Gadsden's spoken thoughts and written views on the so-called service-at-cost franchise, particularly his views as to making the securities at present outstanding on a property fit a valuation made. Mr. Gadsden correctly states that the basic principle of a service-at-cost franchise is the value of the property in question. The valuation of a property surely is an adjunct, and a most important one, in working out a service-at-cost franchise, for unless a valuation is made there will be no way of determining the proper amount which a company is entitled to earn.

Where Mr. Gadsden and I disagree is on his advocating that once a valuation is found then the securities outstanding should be made to conform to such valuation. He does not say this should be done in every case, but I am satisfied that most people reading the article will gather that impression. My thought therefore is to correct it, because I think it would be a catastrophe to the industry and the last straw to break its back should such an impression become nation wide and such action be insisted upon by the authorities and people interested.

NO DIRECT CONNECTION BETWEEN CAPITALIZATION AND SERVICE AT COST

To readjust the securities of a company to fit the physical value of the property would not only be in most instances a difficult job but in a great many instances absolutely impossible except by putting the company through the hands of a receiver. I do not say that it may not be advisable in some cases to re-establish the financial stack-up, or rather readjust the outstanding securities, of a company, but I do say, and without fear of controversion, that this is not an essential of a service-at-cost franchise. The essential things in a service-at-cost franchise are:

1. A fair valuation of the property in question, not only its physical but all other values.
2. A fair return on the valuation so found.

The securities outstanding have very little, if anything, to do with the matter, and I therefore think it is a great mistake to lead people so to think. A property may have bonds, preferred stock and common stock issued, and in considerable excess of the actual value of a property—all without working a hardship upon the car rider, the public or the stockholder. For example, let us assume, and such an assumption is an actual condition existing today in many cities of the country, a company capitalized as follows:

Six per cent bonds outstanding		$4,000,000
Six per cent preferred stock outstanding		2,000,000
Common stock outstanding		3,000,000
Total capitalization		$9,000,000
Actual valuation found by inventory and appraisal		7,000,000
Rate of return allowed		8 per cent
This would mean that a property capitalized and valued as above would be allowed after providing for operating expenses, taxes and depreciation, to earn annually		560,000
It would mean that after paying—		
Interest on bonds	$240,000	
Dividends on preferred stock	120,000	360,000
there would be left for the common stock		200,000
or, if it were all declared out in dividends, a return on the common stock of		6⅔ per cent

Here would be a case where the outstanding securities exceeded the valuation found by $2,000,000. What good, I ask, would it do to make the securities conform to the valuation? None at all as I see it, and if it were done it might and probably would work a great injustice and hardship to many stockholders interested.

MAY PUT BLAME ON WATERED STOCK

Mr. Gadsden wants to "come clean," and that is what he probably had in mind when advocating a readjustment in securities. He wants the public to feel and the car riders to know that the companies want to meet it and them more than half way in order that the credit of the industry may be re-established and the companies thereby enabled to render the service which they should render. This is very commendable, but the fault I find with such teaching is that many people will draw the wrong conclusion and begin again to think that the main trouble, and practically the only trouble, with the electric railway industry is that it is overcapitalized, and that the thing which has broken it down is watered stocks and inflated securities.

I am a stockholder in a number of railway companies and other public utilities and I do not believe and do not think the public generally has now any such view of the situation. It has been educated and truthfully taught in the past few years that this is not so, and I as a car rider and a stockholder feel that it is a serious mistake to undo such teachings.

The truth of the matter is that the electric railways and other public utilities have broken down during the past four or five years of strenuous life because of the many heavy burdens placed upon them in the shape of increased operating expenses, increased taxes and increased cost of money, without being allowed to earn an adequate and compensatory return upon the value of the properties. It is just as plain as a pikestaff, and no one need get out a pair of binoculars to see this very clearly. It is therefore idle to talk about watered stocks and inflated securities, for they have nothing whatever to do with the case. There can be no such thing, because in these days and in this age a public utility company will not be allowed to earn except upon its value ascertained, and it is a sure thing that, this value being once obtained, a company will not be allowed to earn an excessive return upon it. It therefore follows that what it does earn can without detriment to any one—car rider, public or any one else—be distributed by the directors or the stockholders as they may see fit.

FAIR RATE OF RETURN ON FAIR VALUATION

It is all right for the utilities to "come clean" and if it is necessary for any of them to "clean house" they should do it. The public and the car rider, however, should also "come clean" and not allow the political agitator or sensational newspaper to lead them astray. They should learn that unless a company is allowed to earn, and to earn on a full and proper value and not a depreciated value, it cannot serve. They should go further and insist that the authorities allow the utilities to earn. If they do not it will not be the utilities only that will suffer, for the public itself will reap the harvest in inadequate service rendered, stagnant industries and depreciated values of all kinds.

The car rider, while he may many times have just cause for complaint, is not usually unreasonable unless led astray by demagogic teachings. He is more interested generally in the character of the service rendered than in the dividends a company may be paying, and nine times out of ten will be a defender and proud of the company rendering the service if it is the kind of service he desires.

The problem as I see it is to tell the public the needs and necessities and to get the rate-making authorities having these matters in charge to allow the public utilities to earn a proper rate of return so that they may perform and function in the satisfactory way the public wants them to perform and function.

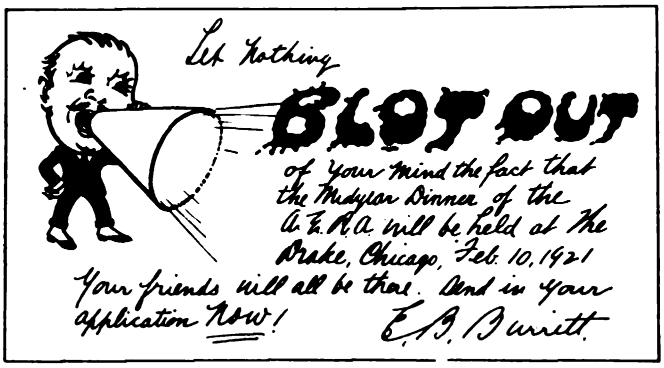
A fair rate of return upon a fair valuation should be the slogan of the utility man. If he departs very far from this path or this line of thought, or if he mixes up the matter of readjusting securities with this sort of doctrine, he is very apt to make the situation complex not only for himself but also for the people desiring service.

Association News

Get Aboard the Special for Chicago

THE midyear conference committee on transportation for New York and vicinity, of which Carl H. Beck, Westinghouse Electric & Manufacturing Company, is chairman, reports that enough reservations have been received practically to fill two special cars. These cars will be attached to the "Broadway Limited," leaving New York Feb. 8 for Chicago, via the Pennsylvania Railroad. All delegates from New York, Philadelphia, Washington and Pittsburgh leaving for Chicago on Feb. 8 are urged by the committee to travel on this train.

The Pennsylvania Railroad will reserve as many as five cars for members if notified in advance. Accommodations can be secured by application to E. B. Burritt, secretary American Electric Railway Association, in accordance with the schedule published in this paper Jan. 15, page 146.



Let Nothing

BLOT OUT

of your mind the fact that the Midyear Dinner of the A.E.R.A. will be held at the Drake, Chicago, Feb. 10, 1921

Your friends will all be there. Send in your application NOW!

E. B. Burritt

Committee on Schedules Meets

THE committee on economics of schedules held its initial meeting at association headquarters on Jan. 24. Among those present were Chairman Edward Dana, Boston (Mass.) Elevated Railway; H. C. Moser, Fifth Avenue Coach Company, New York; J. A. Stoll, United Railways & Electric Company, Baltimore, Md.; Samuel Riddle, Louisville (Ky.) Railway; Donald Goodrich, Twin City Rapid Transit Company, Minneapolis; A. G. Neal, Washington Railway & Electric Company, Washington, D. C., and J. M. Campbell, Atlantic City & Shore Railroad, Atlantic City, N. J. The full list of members of this committee was printed in the issue of this paper for Jan. 22, page 189.

The committee decided that the subcommittee plan of making out the report would be followed. A joint data sheet will be issued shortly requesting information as to what constitutes car-hours and man-hours in schedules, for the purpose of properly defining the various subdivisions that are naturally made of these two important traffic statistical units. The subcommittee to develop proper definitions of car-hours and man-hours, together with their subdivisions, consists of Messrs. Neal, Stoll and Dana. Consideration of variable running time, looking toward definite recommendations, is in the hands of another subcommittee composed of Messrs. Moser, Campbell and Riddle.

Messrs. Goodrich, Sullivan and Ives constitute a subcommittee to prepare a summary of recent methods that have been developed for improving the handling of traffic in congested centers.

It is expected that the committee will meet again early in March.

Educational Plans at Hampton

THE feature of the meeting of the Newport News & Hampton company section held at Hampton, Va., on Jan. 21 was a discussion of the practicability of operating a night school in connection with the section work. Such work has been conducted by the section before with satisfactory results. Discussion at the Jan. 21 meeting brought out the fact that the secretary of the local industrial Y. M. C. A., who had spoken at the preceding meeting, had offered his co-operation in this work and the members of the section felt that this would be of great help to them.

The membership committee reported a membership of ninety-nine, and the executive council in its report stated that progress has been made in the endeavor to obtain suitable quarters for a general reading room and meeting place for the section.

To lighten the serious discussion several entertainers were introduced, and they furnished stories and music which doubly insured the success of the meeting.

Letter to the Editors

Problems Ahead for Trolley Bus

NEW YORK CITY, Jan. 31, 1921.

To the Editors:

The article on the trackless trolley by H. L. Andrews in your issue for Dec. 4 was very interesting. Probably Mr. Andrews, as well as many others of your readers, knows that a trackless trolley line was built and operated in Greenwich, Conn., before there were any trolleys run on tracks, but it is not my purpose to speak on the American history of such projects.

It is to the road conditions that I wish to call attention, because Mr. Andrews devotes but two short paragraphs to these. To a large extent road conditions will govern the usefulness of the trackless trolley, and the places where trolley extensions are desired are usually those where there are either no roads or very poor ones. In most instances it will be necessary to build suitable roads before the trolley bus can be operated. Good roads now cost almost as much per foot as good tracks, and upkeep of roads is a problem in costs which keeps our highway engineers awake o' nights.

The proper location of the overhead wire is another problem. If it is put at the side of the street, near curbs, there will be interference with parked vehicles. Some provision must then be made for the bus to turn out of the way without losing its trolley-wire connection. For general work a center location would be best. Vehicles can observe the rules of the road better with a center location, and considerable traffic difficulty might easily arise with a bus moving along the left-hand side of a road or street against the traffic which follows the American rule: "Keep to the right."

Before the trackless trolley scheme is put out as a definite proposition in this country, the problems above noted will doubtless need to be worked up in greater detail.

"ENGINEER."

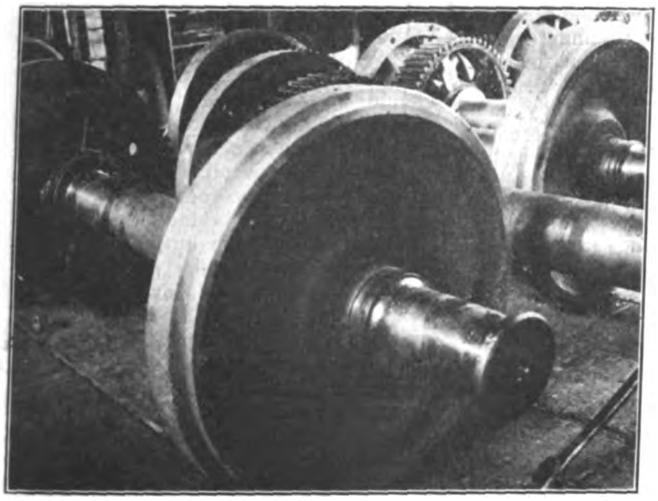
Shop Notes from Vancouver

With Special Reference to the Practice of Turning Down Worn Steel Wheels to Form Centers for Tired Wheels —Preference Shown for Steel Wheels on British Columbia Electric Railway

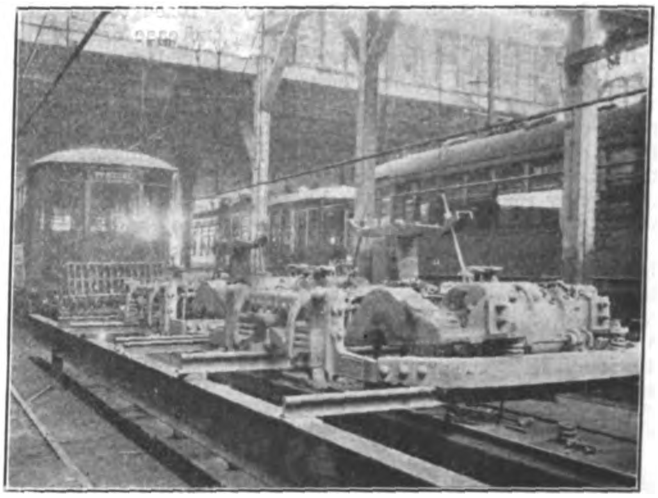
THE British Columbia Electric Railway has extensive shops located at Vancouver and New Westminster, where more than 400 passenger and express motor cars, 500 freight and other cars and seventeen locomotives are maintained.

Routine inspections and light overhaul are given the cars in accordance with the usual practice and a general overhaul is given them at wheel-turning time; that is, every thirteen or fourteen months.

In the city service both cast-iron and steel wheels are used. The preference is for the steel wheels, which are first allowed to wear down to a given diameter and are then turned off to form centers for tired wheels.



WORN INTERURBAN STEEL WHEELS TURNED DOWN TO FORM CENTERS FOR TIRED WHEELS



YOKE FOR HOLDING UPPER HALVES OF MOTOR CASES IN POSITION DURING OVERHAUL

The tires are shrunk on and, of course, the centers last indefinitely.

The steel wheel, A. E. R. A. standard Section B, begins its career with a diameter of 33 in. It is worn down to 29¼ or 29⅛ in., and is then turned to 29 in. in the form shown in an accompanying illustration. The tire, 34 3/16 in. in diameter, is then shrunk on. It is a three-wear tire and is used until it has come down to 31½ in. The original wheels are of Midvale make. The tires in unfinished form are admitted to Canada free of duty.

Some mileages regarding these wheels are as follows: A recent average of 350 solid wheels showed a life of about 195,130 miles, ranging between a maximum of 320,000 and a minimum of 119,800 miles. They were then available as centers for the tired wheels. The tires had an additional life of 176,000 miles each. The average mileage between turnings over a long period has been about 65,000 miles.

The best record for cast-iron wheels is about 116,000 miles, but the range was wide, indicating a very irregular life, and the average was only 46,140 miles. Davis wheels are being tried out in Victoria, where the electric railway lines are also operated by the British Columbia Electric Railway, as there are no facilities for tire turning at this point.

The preference of the company for steel wheels is due to the following experiences: It was found that the cast-iron wheels, unless ground, are more noisy and are hard on axles and bearings. They tend to skid, and have to be scrapped when flats are produced. Chipping of flanges and treads also causes shopping of cars at odd or unscheduled times, an expensive operation. It is found that cars with iron wheels are shopped five times as against twice for those with steel wheels.

As to relative costs, based on recent prices, the cast-iron wheels cost most per thousand car-miles, the steel wheels slightly less and the tired wheels much less, or respectively 43.8, 42.1 and 30 cents per thousand car-miles. The 1920 costs for new wheels were $27, $54 and $30 respectively, and the scrap values $7, nothing and 95 cents.

The original stock of rolled wheels which now furnishes the centers for the tired wheels was purchased in 1910 and 1911. By 1917 the rolled steel wheels had increased in cost to $63 each. After this year the company purchased few new rolled wheels. In that year the 33-in. cast-iron wheels were costing $19 each, with $4.50 scrap value.

On the interurban cars only the steel or steel-tired wheels are used. The solid wheels wear from 150,000 to 276,600 miles and the tires give 112,700 miles additional life each. The American Electric Railway Association standard A wheel is used in this service. The tire fastening is the well-known Midvale bolted type.

Wheel changing in this shop has been made a subject of special practice until it is now possible to change a pair of wheels in from twenty minutes to a half hour.

Among the original "stunts" which have been developed in the Vancouver shops, one shown in the second illustration is of interest. This consists of holding up the upper halves of the motor shells during overhaul by means of a yoke. The yoke is simply a channel-iron blocked up at a suitable height from the truck center plate. The ends of the yoke are bent up at an angle of 30 deg. or so, suitable for connection by means of bolts and nuts with the bales on the motor cases.

One of the latest trolley bus services to be inaugurated is that in York, England, which was installed just before Christmas. The route lies through one of the congested sections of the city and serves a populous suburb. The buses have been well patronized.

Recent Happenings in Great Britain

Interesting Review Is Presented of Social and Economic Conditions at End of Year

(From Our Regular Correspondent)

The year which at the time of writing has just expired has not been a favorable one in Great Britain either for industry in general or for the tramway industry in particular. In every direction there has been the same tale of increasing cost of living, increasing cost of all sorts of materials, and ever rising wages, coupled with a reduction in working hours and output. In one industry or another we never seem to have been clear of strikes or threats to strike.

THE building trade has been peculiarly hopeless, because in spite of a famine in houses and of a smaller number of men being employed in the industry than before the war the trade unions concerned have steadily refused to let into their ranks large numbers of ex-service men who are out of employment. Near the end of the year the government promised to take drastic action, but in January matters were still in suspense.

In consequence of high wages, reduced output and a falling demand for many articles owing to price, unemployment began to get serious during December and the outlook for the winter was bad. Organized utility works, principally road-making, have been put in hand to afford relief.

There are, however, some encouraging features. The settlements arrived at with the railway men and the coal miners promise to obviate strikes, and the output of coal has already begun to increase. The railways, however, are still working at a loss.

Hope Seen in Increased Production

In connection with manufacturing some people in a position to judge see a ray of light in the direction of increased output. It is said that many of the workmen are less averse to piecework than they have hitherto been. If piecework is largely adopted the "go easy" trouble will disappear, and the hope is that while the men may make even higher wages than before, production will be so augmented that the price of the finished articles will come down. But in the meantime steel, for example, can be imported from the United States and from Belgium at much lower prices than those for the British-made article.

Manufacturing and contracting work for tramway purposes has naturally been in a depressed condition. Practically no track extensions are being carried out and renewals of track and plant are kept down as much as possible in the hope of lower prices in the future. In the tramway industry itself the year has seen further increases of wages and of fares.

In January a national demand for more wages was still unsettled. The tramway authorities believe that in many cases they have reached the limit in fares—that is to say, further increases would so reduce the number of passengers that no increased revenue would be obtained. Accordingly they say they cannot pay higher wages, and they point out that at present there is an average loss on working of about 3d. per mile run. Unfortunately in the case of drivers and conductors the nature of the work precludes any possibility of "increase of output." The financial future of the industry is very uncertain.

The tramway men's wages dispute continued during December. As previously mentioned the employers had refused to concede the demand for an increase of 12s. per week and they declined a proposal by the men for arbitration on the ground that if an award of an increase were given they could not pay it. In the middle of December the Ministry of Labor intervened in the hope of bringing about a settlement. The employers, however, stood firm, and the Minister thereupon decided to set up a court of inquiry under Part II of the industrial courts act of 1919. The concurrence of the parties is not necessary for the holding of such an inquiry, and the finding of the court has no binding force on the parties. The idea is that an impartial and just decision will commend itself to the public.

In the present case, however, soon after the decision to institute the court was announced, both employers and employed agreed to be represented before it. It was not till Jan. 8 that the constitution of the court was announced. It has five members, including representatives of employers and employed. The court is instructed to inquire into the causes and circumstances of the dispute and to report thereon to the Minister of Labor. At that time of writing the sittings of the court had not begun.

New Bill Needed

Shortly before the parliamentary session closed at Christmas the government withdrew its electricity bill, which had long been pending, as its compulsory powers in connection with the formation and functions of district electricity boards had excited much opposition. Instead the government intends to promote in the coming session a smaller bill containing powers which the Electricity Commissioners (established under the existing act) consider urgently necessary. The bill will confer on the local joint electricity authorities (which are voluntary, not compulsory bodies) powers to borrow money and raise capital. Provision is made for revision of maximum charges every three years instead of five. It is further proposed that owners of large railway and tramway generating stations shall be entitled to dispose of surplus power for general public purposes.

Discipline has become slack in many cases compared with pre-war days. There is, however, at least one heroic municipal tramway committee left in the country—namely, that of Newcastle which was not afraid to assert itself. The Newcastle tramway employees took a ballot, the result of which was a decision not to work on Christmas Day. The tramway committee, on its part, held that the public convenience demanded that a service should be maintained. It offered the men double pay for the day and it told the public that the service would be run as usual. When the day came out of 950 men only 237 failed to put in an appearance for work and the cars were taken out in the ordinary way.

The committee followed up its energetic and successful action by deciding on Christmas morning that the men who had not reported for duty should be suspended till the following Thursday (Christmas was on a Saturday), when a final decision would be made. The peculiar fact was ascertained that many men who voted in the ballot for taking the holiday actually reported for duty, while others who voted for working did not report for duty because of loyalty to their trade union. When the tramway committee met again on the following Thursday a deputation from the men appealed for the reinstatement of the 237 who had been suspended. The committee thereafter passed a resolution instructing the general manager to reinstate the men and to inform them that the committee trusted that it would not become necessary in future to deal more drastically with such serious breaches of discipline. Over half of the men who were suspended had been only two years or less in the service of Newcastle tramways.

Another example of the enforcement of discipline by a municipal tramway authority comes from Edinburgh. It may be recalled that some time ago the tramway conductors in the city determined to refuse to allow any standing passengers inside the cars. A strike took place and twenty-one men who persisted in this course were dismissed. The matter came up for review before the Town Council on Dec. 22, when an appeal for the reinstatement of the men was circulated by their trade union. By forty-six votes to four the Town Council confirmed the view of the tramway committee that the men dismissed should not be reinstated. The chairman of the committee said that since the Town Council took over the undertaking from the tramway company which had previously worked it that working conditions of the employees had been vastly improved. The position taken by the men was an attempt to defy the committee and the management and to control the undertaking.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Toledo Grant in Effect

Seven-Year War Ended with Acceptance of Service-at-Cost Plan of Operation

Acceptance of the service-at-cost ordinance at Toledo, Ohio, was filed with the city clerk at 11:59 o'clock on Monday night, Jan. 31, and Toledo began its twenty-fifth-year experience with the Milner franchise plan. The only portion of the ordinance which has not been complied with by the Toledo Railways & Light Company is the section which provides that the property shall be turned over to the Community Traction Company "free of all mortgage encumbrances."

In lieu of releasing the first mortgage on the property at this time, which would have required the raising of an additional $1,900,000 in cash by the Doherty interests, an agreement between the city of Toledo and the Cities Service Company, the Doherty holding corporation, was executed by which the city sinking fund trustees shall have possession of the $8,000,000 of the company's bonds and the 6 per cent revenue accruing from the operation of the lines until the money to release the mortgage shall have been raised and the lien discharged.

The time limit for the accomplishment of this financing is set as Dec. 2, 1921. If, by that time, the company has not raised the necessary cash, the ordinance may become ineffective and the company will forfeit $500,000 in cash, which will have accrued to the bonds. If that much has not been received into the fund the Cities Service Company agrees to make up the balance to $500,000.

On Monday afternoon the officials and directors of the Community Traction Company met and elected permanent officers. Frank R. Coates was chosen president and general manager. He is the only official permitted to serve both companies by the terms of the ordinance.

Joseph Enright was made superintendent of roadways and equipment and Albert Swartz, superintendent of transportation. Arthur P. Nicklett was made secretary, treasurer, purchasing agent and auditor, and Vincent J. Waltz, claims attorney. T. H. Fair, vice-president, and F. L. Blackburn, assistant secretary-treasurer, are both with the New York office of the Doherty interests. The directors are Frank R. Coates, Albert Swartz, Henry Friede, C. T. Munz, Joseph Enright and W. L. Milner, representing the city.

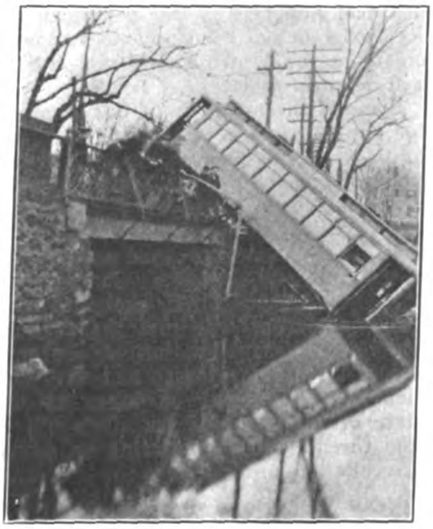
The new rates of fare went into effect with the midnight line-up on Monday night. They are 6 cents for fare and 1 cent for transfer. Tokens are still being issued at a rate of five for 30 cents.

Interurbans entering the city will continue to charge 7 cents for the city fare until new contracts are made. These will have to be negotiated between the commissioner, the railway and the interurban lines. They are subject to arbitration also.

The new commissioner at Toledo will make a study of the system here and proceed to establish minor changes in service looking to economy in operation.

Car Jumps Bridge Into River

A car of the Intertate Consolidated Railroad, Attleboro, Mass., jumped the rails on Lebanon bridge near Attleboro recently and, held by the resistance box, balanced over thirty ft. of water in Ten-Mile River. Motorman Percy Titus was trapped in the vestibule and after smashing the door and window at the end of the car nearest the water crawled into the car. Conductor Robert Pardington, climbed into the rear vestibule high in the air, smashed the door and helped the panic-stricken passengers down to the bridge floor, 8 ft. below. Although the ten passengers were thrown to the lower end of the car, no one was seriously injured.



CAR SUSPENDED OVER RIVER

A combination of slippery rails and a bad curve is believed to have been the cause of the car jumping the track and crashing through the bridge railing and the forward end plunging into the water.

The accompanying illustration is published through the courtesy of the Boston *Post*.

Municipal Line Starts

First Section of Detroit's New System Has Been Placed in Service—Fare Five Cents

Regular service was started over 13 miles of track of the municipal railway lines at Detroit, Mich., on Charlevoix and St. Jean Avenues at 4:30 a.m. on Feb. 1. The Charlevoix cars run from Alter Road to Belleview Avenue and the St. Jean cars run from Montclair and Harper Avenues to St. Jean and Kercheval.

Every detail incident to a regular operation of the first two of the municipal lines has been worked out by Joseph S. Goodwin, general manager of the Detroit Municipal Railway. A 5-cent fare is being collected and five-minute service will be given until checkers determine just what service is adequate. Eighteen of the twenty-five cars now on hand are being used.

The beginning of service was marked by little ceremony. Following an inspection trip made over the lines a few days after their completion Mayor Couzens expressed his satisfaction with the progress made and the work done. Other city officials also made the trip over the completed sections with the Mayor.

Connections are made with the Detroit United Railway's lines at the Mack-St. Jean intersection and at the intersection at St. Jean and Kercheval Avenues, but no transfer arrangements have been made with the Detroit United Railway. Passengers riding over both lines will have to pay two fares, the 5-cent fare on the municipal line and the 6-cent fare to the Detroit United Railway. Transfers from one municipal line to the other will be issued free.

The cars being operated on the city lines are of the one-man safety type. To permit this an ordinance passed several years ago prohibiting their use in the city of Detroit was amended by the City Council. The Detroit Federation of Labor is opposed to the operation of one-man cars on the grounds that they are unsuitable for local traffic and reduce the chances for employment. This argument relative to the matter of employment was also advanced in opposition to the use of the one-man cars when the original ordinance was passed.

About forty operators for the city cars have been trained in the operation of the safety cars during the past few weeks. The men, several of whom are former Detroit United Railway employees, are provided with uniforms similar to those worn by the Detroit City Firemen.

Chicago Traction Tangle Gets Worse

Resolution Before City Council Would Abrogate 1907 Ordinances—Mayor Informs B. J. Arnold Contracts Have Been Voided

The political squabble over the traction situation in Chicago is becoming more complicated. Realizing that the Mayor's plan for people's ownership and 5-cent fares will require several years to consummate, the local transportation committee started on some short-cuts to secure a 5-cent fare while waiting for people's ownership. It decided to recommend to the City Council that the traction ordinances be voted null and void. The Council postponed action on the resolution for one week.

THE court now has before it the question of whether or not the contract has been violated by the companies, but has not handed down its decision. Despite the fact that neither the court nor Council has acted, Mayor Thompson notified B. J. Arnold, chairman of the Board of Supervising Engineers, that the city has cancelled the contracts. At the same time the city is demanding that certain provisions of the contracts be rigidly enforced, so there is a good deal of anxiety as to where cancellation of the franchises would lead.

PROGRAM NOT CUMULATIVE

The 1907 ordinances provide that the companies shall build 23 miles of extensions each year, on order of the City Council. Under this provision, the companies have built 233 miles of track in thirteen years, or 17.9 miles a year. It was established some time ago that if it was a physical impossibility for the companies to build the full 23 miles in any one year, the requirement of the ordinance should not be cumulative.

This matter was recently brought to an issue by the insistence of various Aldermen that further line extensions be made. They were told by the law department of the city that in view of the controversy over the status of the ordinances, the companies would ignore any order of the City Council on any matter pertaining to rate of fare, service or extensions, and that they would have greater success in securing the extensions demanded if they would vote the present contracts abrogated and then appeal to the new public utilities commission for these extensions. Under this arrangement, the extensions which might be called for would not be limited to 23 miles in any one year and it is said that with the probability of a hand-picked commission, yet to be appointed, it is likely that orders would be issued favorable to the wishes of the city administration.

CONTRACTS DECLARED VOID

Consequently, the local transportation committee proceeded immediately, at the request of Chester E. Cleveland, special assistant corporation counsel on traction matters, to approve an ordinance declaring the contracts with the Chicago Surface Lines "cancelled, annulled, abrogated and terminated in their entirety because of the repudiation thereof and a refusal to keep, live up to and perform the same in essential particulars by the said companies."

The proposed ordinance also directs the city law department to proceed immediately under the public utilities act to request the commission for an order directing the surface lines to construct the extensions within a definite time limit. At this time Mr. Cleveland read a letter to the local transportation committee which Mayor Thompson had addressed a few days before to Mr. Arnold.

In this letter the Mayor informed Mr. Arnold that "The City of Chicago has elected to and has cancelled, annulled, abrogated and terminated said contract-ordinances in their entirety" because the various companies have repudiated the contract-ordinances in essential particulars. "Therefore, there is no authority under and by which said Board of Supervising Engineers can or does exist or act; and anyone pretending to act as a member of said Board will do so in violation of law."

Some of the members of the committee expressed a good deal of surprise as to when the cancellation took place, inasmuch as no formal action to this effect has been taken by the Council, the Circuit Court of Cook County in which the matter is pending, or the Illinois Public Utilities Commission. Mr. Cleveland, however, explained that the cancellation was just the gradual result of the repudiation of the contracts by the companies and that any definite date might be taken as the date of the filing of the city's bill in the Circuit Court requesting an actual cancellation order.

NO VIOLATIONS, SAY COMPANIES

The position taken by the companies is that there has been no violation of the contracts, since the Supreme Court of Illinois has held this to be the case, in upholding the orders of the Public Utilities Commission. If the city passes the ordinance abrogating the contracts and an order is secured from the commission for considerable extensions and improvements, it is probable that the companies will be forced to appeal to the courts because of their financial inability to carry out the order, and raising the question as to the reasonability of the proposed extensions.

While contending that the contracts are abrogated, Mr. Cleveland has been very insistent that the Board of Supervising Engineers should prevent the use of any money taken from the renewal and depreciation reserve fund created by the 1907 ordinances, for the purchase of new equipment in accord with a recent order of the Illinois commission. Some abstracts from a recent letter written to Mr. Cleveland by Mr. Arnold throw light on this dual situation. He writes:

> It seems to me that it is for the Board of Supervising Engineers to insist upon the terms of the ordinances except as they may be modified under the law as determined by the courts. While the law is being determined it is the duty of the board to respect all orders of the courts, or of the commission subject to the courts, taking such care as it legally can, however, that this shall be without prejudice to the rights of the public and of all the interests entrusted to the Board. The one thing that the board should not do, as it seems to me, is to furnish, by its failure to perform its duties, any justification whatever to the traction companies for claiming that they are thereby excused from complying with their obligations. I find myself unable to ignore the fact that nothwithstanding your confident assurance as to the ultimate establishment of your contentions (in the case before the Circuit Court of Cook County) the traction companies are in fact now operating under the ordinances, as modified by various orders of the State Public Utilities Commission, and claim the right to continue so to do.

In a letter to Mr. Arnold under date of Jan. 5, 1921, Mr. Cleveland stated that "assuming the ordinances still to be in force, we maintain that upon you, as chairman of the Board of Supervising Engineers, rests the positive duty of seeing to it that no part of the renewal and depreciation reserve fund is diverted to any purpose other than that for which it has been, or is, created under the ordinances."

EXPENSE ACCOUNT ASKED

After reminding Mr. Cleveland of what action had been taken by the Board to safeguard the proper uses of the surplus money of this fund, Mr. Arnold suggested to the city representative that he inform the chairman of the board how he can perform what Mr. Cleveland considers "the positive duty, etc.," in regard to the use of this fund, as noted above. Mr. Arnold continued:

> In particular I would like to have you inform me what steps, if any, you think I can take as chairman of the Board of Supervising Engineers, to prevent the companies from complying with the order of the commission with respect to the special equipment fund mentioned, and under what authority you think I could take such steps. Why don't you prevent them from doing this, while your litigation is pending? Are you not simply trying to shift to me the dilemma which really confronts you? If the ordinances are not in effect, how is the city now concerned with the renewal and depreciation reserve fund? If the ordinances are in effect, why does not the city enforce its contract rights as to the maintenance and use of these funds? The Board of Supervising Engineers is merely certifying to the facts which the ordinances require it to certify; and it is safeguarding these certificates to the full limit of its ability. It permits no money to be paid out of the renewal and depreciation reserve funds for new cars, or any other expenditures that do not constitute renewals under the explicit provisions of the ordinances quoted in your letter."

For the second time in three weeks the City Council on Jan. 28 served Mayor Thompson's traction commission with a demand for an itemized report of its expenditures, which totaled $180,000. The report made by this commission was reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 15, page 150, and commented upon in the issue of Jan. 22, page 167. Several of the Aldermen expressed evident disapproval of the amount of money expended, considering the character of the report turned in. Besides asking for an item-

ized statement of expenditures, the Council order directs the commission to report its expenditures monthly hereafter. The commission still has $70,000 left in the fund appropriated for its use.

No Fraud in Seattle Deal—Rescinding Proposed

In its findings to the Superior Court regarding the $15,000,000 deal whereby the city of Seattle, Wash., acquired the railway lines of the Puget Sound Traction, Light & Power Company, the King County Grand Jury on Feb. 1 stated it found no evidence of corruption in connection with the matter but that the lines were worth only $5,000,000 at the time of purchase and that the city is entitled to equitable relief and the Council should take steps to obtain it. No indictments have been returned.

Mayor Caldwell's special investigator, Wilmon Tucker, in recommendations to the City Council concurred in by the Mayor, states that the traction company was guilty of constructive if not actual fraud with reference to the value of the property. He also states that the contract is impossible of performance and that the city is under no obligations to enhance the value of bonds issued by the city in payment of the railway by furnishing additional funds or security in an endeavor to carry out the contract.

Mr. Tucker advises that the city make an offer to rescind and tender back all property and ask for the return of the bonds, stating that if the tender is not accepted the city should bring action in equity to rescind the sale. He also says that if the Council will not agree to such action, the tax payers should institute legal proceedings to relieve them from unjust burdens.

Wages of Executives Cut in Cleveland

Wages and salaries of all officers and employees of the Cleveland (Ohio) Railway, with the exception of conductors and motormen, were reduced 10 per cent on Feb. 1. In the order announcing the reduction it was stated that "There will probably be a further reduction later on, unless conditions change materially." The 10 per cent reduction included the pay of John J. Stanley, president of the company, who has been getting $30,000 a year.

Wages of track repair laborers were reduced in an order issued on Jan. 3. Company officials announce that when the present wage agreement with the trainmen's union expires on May 1 the conductors and motormen will also have to accept a reduction of at least 10 per cent.

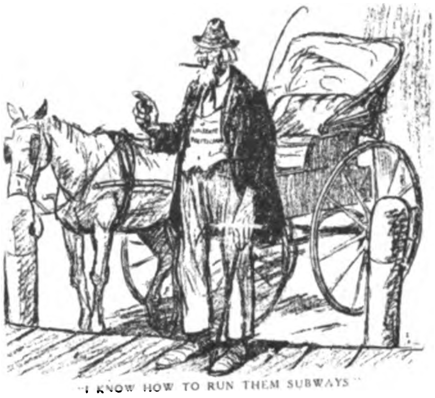
The men now get 75 cents an hour after the first year's service. Officials of the union have so far said nothing for publication regarding the proposed reduction, but have intimated that a strike is quite probable if the company attempts to carry out its announcement.

Governor Miller's Message Provokes Comment

New York Executive Removes Causes of Early Criticism in Talks to the Newspapers

Few purely local state papers have caused greater commotion in public and political circles than the message of Governor Miller of New York to the Legislature in regard to the public utilities. It has caused rifts in the ranks of Republicans. It has encouraged hope with the Democrats that they may again elect a Democratic Mayor in New York despite the incubus of the Hylan administration. It has been the subject of column after column of editorial comment.

MR. LA GUARDIA, the Republican President of the Board of Aldermen of New York, was stunned by the message. He interpreted the Governor's remarks to mean that all jurisdiction and control or say in traction matters would be taken from the City of New York except to put out money for new subways. He said that no matter what increased fares the surface lines obtained, they could not operate successfully. He characterized as flippant and entirely unbecoming the Governor's statement that there was a lot of loose talk about home rule.


"I KNOW HOW TO RUN THEM SUBWAYS"

NEW YORK "WORLD'S" REACTION TO MESSAGE

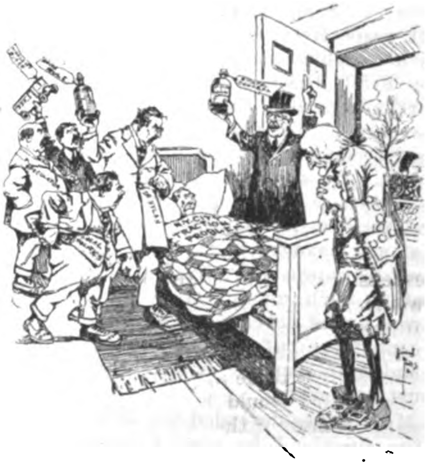
City Comptroller Craig characterized Mr. Miller's proposed solution of the fare question as a step backward fifty years. He said that the people of New York City would never tolerate the administration and control of an investment of approximately $400,000,000 of their own money in the subways by any public body or commission that was not directly responsible to the City of New York.

James J. Walker, Democratic leader in the Senate, looked upon the statements in the Governor's message as the alibi of the Interborough for an 8-cent fare. He said that the writer of the message was either the editor of the *Subway Sun* or the editor of the *Subway Sun* helped to write the message.

On the other hand Majority Leader Senator Lusk in answering Mr. Walker said that the Governor approached the problem courageously from the viewpoint of the man who wanted to accomplish something of practical benefit to the people. Assemblyman Simon Adler, majority leader, was also reported as saying that the Governor's message pointed out the way for the solution of the railway problem in the city of New York.

John H. Delaney, Transit Construction Commissioner, commenting on Governor Miller's message, said that only the outworn over-capitalized surface lines that are paralleled by the city-owned rapid transit line were drifting toward disaster. If the public did not patronize such lines after public money has been invested to provide better service there was no public obligation, according to Mr. Delaney, to provide dividends or speculative profits on the uncontrolled securities of such lines.

Frank Hedley, president of the Interborough, did not deem it proper for him to comment on the Governor's plan. On the other hand, Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, said that it seemed to him that the only hope for a proper solution of the traction problem lay along the lines of the Governor's message. He said that the only opposition to the sound and sensibe method advocated by the Governor would come from those who sought personal and partisan interests rather than approved a just and proper solution of the matter. Later Mr. Hedley stated the case of the Interborough from the standpoint of the situation which now confronts that company and James L. Quackenbush, counsel for the company, prepared for the *Herald* a summary of the company's case from the point of view of law and equity.



EVENING "POST'S" IDEA WAS KILLING THE PATIENT WITH KINDNESS

On Jan. 25 Governor Miller amplified his message to the Legislature. He characterized as a state of mind verging on insanity the views of some legislators that they will only vote for the plan if it provides a fare not to exceed 5 cents and municipal control. He said that the fare question was only incidental. The real question was one of public service. The solution of the traction problem transcended the fare question. With regard to the claim that his recommendations usurped powers from the city, the Governor explained that the city never had power over public utilities except that delegated by the State. The interpretation was correct that his recommendations meant that, while he believed in municipal ownership as the ultimate solution, he did not believe in municipal operation. The Governor also explained that it was his purpose to appoint to the proposed new commission residents of New York City. He further elucidated his messsage by saying that the city should have representatives on the directorates of the corporations.

The *Times, Herald, Journal of Commerce, Commercial* and the *New York Tribune*, among the morning papers, are sympathetic with the message, although the *Tribune* is against the retention of a flat fare. The *World* and *American* oppose the Governor's message. The *World* does so, largely, because of the idea that the home rule principle would be violated and the *American* because of its avowed opposition to all corporation interests. Among the influential evening papers the *Post* was at first inclined to align itself against the Governor, but has since expressed the opinion that remarks made by the chief executive subsequent to the presentation of the formal message have done much to clear up some points in that document which it regarded as obscure.

The message was debated at a public meeting on Feb. 2 by Henry H. Curran, president of Manhattan; Job E. Hedges, receiver New York Railways; Oliver C. Semple, and Edward M. Bassett, respectively former assistant counsel and public service commissioner of the First District Commission. Mr. Curran conceded that the Governor is the only public official who has really tried to find a solution of the traction tangle. He approved the creation of a new state commission to get the facts and recommend remedies, but insisted that any changes in fares or contracts must be approved by the Board of Estimate. Such an investigation he believed would develop a plan based on a 5-cent fare, but if a square deal demanded an increase in fare the people must be shown.

Mr. Hedges defended the Miller plan. "The question," he argued "is whether a city administration vocally and visibly incompetent shall be left to the dickerings and bickerings which for three years have not advanced one single constructive thought on this subject." At the conclusion of his talk there was a demand by the audience for an extension of the time allowance. Mr. Hedges' address was replete with epigrams. Some of them follow: "Regulation presupposes something to regulate, but if nothing is done transit in New York soon will be only a memory." "Buses are only a temporary anæsthetic." "If I have been sick for three years and a New York doctor does nothing I feel I have a right to call in an Albany doctor who at least agrees to make a diagnosis." "The plea for home rule is like an alibi when your wife asks you where you have been last night and you don't remember."

Mr. Semple said that the state has power over all streets for the benefit of the public and held that the transit tangle should be taken up by business men. The Board of Estimate, he said, had acted like a lot of fellows who never had a real job in their lives.

Mr. Bassett held that there was not the seriousness in the situation today to demand state interference there was when the original subways were laid out.

Addresses were permitted from the floor and were about equally divided for and against the plan. The chief points made in opposition were that the capitalization of the companies included watered stock, higher fares would be a hardship to poor people and there should be home rule on the question.

Wage Cut in Cleveland

Railway There Makes Definite Announcement of 20 per Cent Decrease in Pay of Trainmen

A 20 per cent reduction in wages for all motormen and conductors, to take effect May 1, when the present wage agreement expires, was announced on Feb. 1 by George L. Radcliffe, vice-president and general manager of the Cleveland Railway. This means a cut from 75 cents to 60 cents an hour.

In addition to the proposed cut in wages, the company announces the discontinuance of special compensation agreements entered into after recommendations by the War Labor Board in 1918. These agreements provided for time and one-half for overtime, excess time for spread runs, eight-hour straight runs on Sunday, ten hours' pay for eight hours' work on night cars, etc.

The proposed reduction would save car riders in the neighborhood of $1,500,000 a year according to Traction Commissioner Fielder Sanders. Mr. Sanders said that if the reduction went into effect on May 1, it would be reasonable to expect decrease in fare after the wage decrease had been in effect long enough to increase the interest fund.

Fred Telschow, president of the local union said: "I have nothing to say until May 1." Identical comment was made by W. M. Rea, secretary of the union.

The bulletin which was issued by the company as a notice of the proposed cut follows:

> Effective on May 1, 1921, and continuing thereafter until further notice, there will be a reduction of fifteen (15) cents an hour in the wages of all motormen and conductors employed by this company.
>
> On that date the recommendations of the War Labor Board relative to time and one-half for overtime, excess time for spread runs, eight-hour straight runs on Sunday, ten hours' pay for eight hours' work on night cars, etc., which have been effective since July 31, 1918, will be discontinued.
>
> The minimum day of six (6) hours will remain as at present.

Approximately 3,400 motormen and conductors are employed by the company. The average monthly pay roll for 1920 was $555,324. Under a 20 per cent reduction the average monthly pay roll under similar conditions would amount to about $444,260. This would be an average monthly saving to car riders of $111,064.

Paul Wilson, assistant secretary of the company, said:

> The interest fund in December was $39,000. Revenue has been falling off rapidly. It is a case of either cutting expenses or cutting service. The service is not any more than adequate now. The company decided to cut expenses.
>
> The present fare of 6 cents is as high as it can be made without amending the Tayler grant. No one wants to see the fare go up if it can be reasonably kept down. Without amending the Tayler grant the interest fund would be wiped out and the city would lose regulatory control of the company.
>
> Wages of all other employees from the president down have been cut correspondingly, effective today. Wages of the motormen and conductors are fixed at their present scale until May 1 by agreement. It would be unfair to the rest of the employees if we did not reduce the wages of these 3,400 train men at that time.

The contract between the company and the union provides that once a year either party may submit proposed changes to the other. It also provides for arbitration in case of a dispute.

Wages of trainmen have increased from a maximum of 33 cents an hour in April, 1916, to 75 cents an hour at present. On May 1, 1916, the union signed a two-year contract with the company providing a maximum of 35 cents an hour, an increase of 5 cents.

In January, 1918, the company offered a voluntary increase of 6 cents an hour, which would have made the maximum wage 41 cents. This the union refused, and on May 1, 1918, it made a demand for 60 cents an hour. This the company refused and the men struck.

The War Labor Board arbitrated this strike after one hearing in Chicago and two in Washington and set the wage at a maximum of 48 cents an hour. The settlement was made in August, 1918, retroactive to May 1. The board at this time also made provisions of time and a half for overtime and recommended special compensation, etc.

In May, 1919, the union did not ask for an increase in wages. There had been a temporary slump in business conditions for a few months following the armistice. In June, 1919, following an increase granted to workers on the Detroit United Railway the Cleveland union demanded a raise. After a strike of three days Governor H. L. Davis, then Mayor of Cleveland, offered his services and settled the dispute, the company granting the men a raise to 60 cents after City Council had promised the company to increase the dividend rate from 6 to 7 per cent. The dividend increase, after being authorized by Council, went to a referendum vote of the citizens and was rejected.

In May, 1920, the men demanded an increase to $1 an hour. Mayor W. S. Fitzgerald tendered his services in the dispute which followed this demand, and the men accepted an increase to 75 cents.

Strike Follows Reduction in Wages

Trainmen in the employ of the United Traction Company, Albany, N. Y., went on strike on Jan. 29 in protest against the reduction in wages announced by the company. As noted in the ELECTRIC RAILWAY JOURNAL for Jan. 29, pages 235 and 244, the United Traction Company has just received permission to charge an 8-cent fare in Albany, but the Public Service Commission denied the company's right to do so in Troy, where there is a provision in the charter which prevents an increase. Several days ago the company notified its men that the cut in wages would be effective with the putting into effect of the increased fare in Albany, although in Rensselaer the city fare is cut down to 5 cents, where it has been 7 cents heretofore. In Troy the union men voted to a man to strike to retain the 60-cent an hour schedule of pay and the Albany union followed a night or two later. The Public Service Commission of the Second District of New York has issued an order requiring the company to appear before it and show cause why service is not at present operating.

News Notes

Newspaper Runs Series on Railway Problem. — The Grand Rapids *News* is running a series of articles on the transportation problems affecting Grand Rapids. The *News* has called upon city officials and others who have made a study of the bus question to express their views so the public may benefit thereby. One article written by City Commissioner Shaw outlined in detail the service-at-cost plan now under consideration by the City Commission. This proposal was reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 29.

Homes Ready for Employees.—Work on the construction of bungalows under the employees' housing program outlined by the Los Angeles (Cal.) Railway is nearing completion, and it is expected that they will be available for use at an early date. In the Jan. 10 issue of *Two Bells*, the official publication of the Los Angeles Railway, it states that so far sixty families have been accommodated under this housing plan. In the majority of these instances the employees have had a home selected and the railway has financed the purchase.

Wage Question Discussed in Brooklyn. —The question of wages in the future has been discussed in a general way by the management of the Brooklyn (N. Y.) Rapid Transit Company with the employees' representatives and the representatives were told that there was no suggestion at this time of an immediate reduction in wages by the company. The entire matter was discussed informally and in a general way, and amounted to nothing more than an interchange of views on the question of wage readjustments throughout the country.

Electrification Being Considered.— George W. Lee, chairman of the operating board, states that the Ontario Government is seriously considering the electrification of the Temiskaming & Northern Ontario Railway. Reports secured from experts show the cost would be about $9,000,000, but the results would warrant the expenditure. One of the main benefits would be the making of the line self-sustaining in regard to motive power, through eliminating the necessity of the heavy importation of coal. The road is more than 300 miles long.

Trackless Trolley for Erie.—A. R. Myers, general manager of the Buffalo & Lake Erie Traction Company, has agreed to apply to the city authorities of Erie, Pa., for a franchise to operate a trackless trolley upon certain streets of the city. It was declared at the conference between representatives of the railway and the municipal authorities of Erie that the General Electric Company now is experimenting upon the car at its Schenectady plant and that as soon as negotiations can be completed several of the cars will be brought to Erie. It is proposed to try out the system in Liberty Boulevard between Second and Thirty-second Streets.

Track Being Torn Up in Blue Island. —The Chicago & Interurban Traction Company is tearing up 1 mile of single track on Canal Street, Blue Island, Ill., extending from the main line at Western Avenue to Calumet Grove. This line was built to serve the picnic grounds at Calumet Grove, at one time a very popular place. In recent years, however, the only business done by the company on the line to the park was on Sundays in the summer. A twenty-minute service has been given seven days a week, using one car. The annual loss on operation was about $8,000. Permission to discontinue service and dismantle the line was granted by the Illinois Public Utilities Commission just before the close of the year 1920.

Chicago Newspapers Raise Pertinent Question.—In the controversy in Chicago and Illinois over the abolition of the Public Utilities Commission and the restoration of 5-cent fares two Chicago newspapers have raised a very pertinent question. They point out that the campaign fight was waged on the platform that Governor Lowden's commission was wrong in raising fares above 5 cents. But if it was wrong, they now ask, why does not Governor Small's commission order the fares reduced to 5 cents as soon as the appointments are made. They say that this would be a very speedy way to restore 5-cent fares while it may take several years to complete the Mayor's plan for a people's ownership and a 5-cent fare.

Transportation Difficulties in California.—A recent issue of the San Francisco *Chronicle* forecasts trouble in the present California Legislature between railway and motor transport interests. H. C. Donoho, the writer of the article, states that the fight will center about efforts to impose additional taxes on auto stages and motor trucks. How extensively the auto as a facility in transportation has progressed in California is shown in a photo which accompanies the account. It is a view of the Los Angeles passenger depot for auto stages where 600 buses each day arrive and leave for points as far north as San Francisco and as far south as El Centro. All steam railroads and electric interurban lines operating in California openly advocate legislative measures that will put an end to all unfair transportation competition.

A Penny a Day to Keep Poverty Away.—Employees of the Toledo Railways & Light Company, Toledo, Ohio, have evolved a plan to help many of their fellow workers put on short time or laid off during the period when closed factories have caused a decrease in both power and railway service. The workers have agreed to donate 1 cent out of each dollar they receive into a fund to be administered by a committee of both employees and officers and the company agrees to match the money of the men. With a monthly payroll of nearly $300,000 this will give a fund of $6,000 a month for the support of men whose families are in need. Very few cases of need have arisen in the ranks of the rail-light employees, but the fund is started in order to prevent any of the men from appealing to the city for help. The city has opened centers for the free distribution of food.

A New Offer to Miami.—Attorney Crate D. Bowen, representing the Miami (Fla.) Traction Company, which has not been operating since the fire which destroyed its powerhouse last fall, appeared before the City Council and suggested that the city consider the possibility of purchasing the rails, equipment and franchise of the company. The Council did not take any action, in fact the attorney did not ask any, merely suggesting consideration of such a proposition, but many hold that the company has forfeited franchise rights and that all the city should buy is the rails and equipment. The need for railway service is stressed by business men everywhere. The jitneys that have sprung up are inadequate and unsatisfactory. No action will be taken, it is believed (since the voting in of a commission form of government) until the new government is framed and the new commissioners come into power. Mention of this prospective sale was made in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 1.

Financial and Corporate

Preferred Dividends Paid

Washington Railway & Electric Company Shows Improved Earnings Under 8-Cent Fare

The report of the president to the stockholders of the Washington Railway & Electric Company, Washington, D.C., covering the operations of that company and its subsidiaries for the year 1920, reviews the fare situation. On Jan. 6, 1920, the company petitioned the Public Utilities Commission of the District of Columbia for a further increase in fare from 7 cents cash with four tickets for 25 cents, the rate then prevailing. This petition was not acted upon until April 15, but relief was granted effective May 1. The 7-cent cash fare was increased to 8 cents and the ticket rate of four rides for 25 cents was made four rides for 30 cents.

NEW RATES HELP COMPANY

Under the new rates the financial condition of the company improved so that it was possible on Aug. 20 to pay the cumulative dividend of 2.5 per cent due on the preferred stock for the period Dec. 1, 1919, to June 1, 1920. On Dec. 1, 1920, the preferred dividends for the six months just then ended were also paid, thus paying in full to date all preferred dividends due. No dividends, however, were paid on the common stock during the year.

The better showing made, of course, is due largely to the higher rate of fare effective May 1, last. It is also due, in a considerable degree, to increased efficiency and operating economies, for early in the year certain lines were rerouted. This not only saved in car mileage but greatly reduced the congestion at some of the most important loading points, thereby permitting a more regular and expeditious movement of cars. The company has also proceeded in a small way with the operation of one-man safety cars, a type of car which seems to be well adapted to operation on some of the lines.

It is also proceeding with the conversion of open cars to modern trailer cars of the general appearance of the most recent equipment purchased. The operation of such trains is proving economical and will be further tried out during the coming year.

There has also been a considerable improvement in the accident situation. During the year the number of accidents was reduced 22 per cent and the number of claims presented was reduced 30 per cent.

During the year 2.65 miles or 4.2 per cent of underground trolley trackage was rebuilt. The largest job was on the Connecticut Avenue line extending from Dupont Circle to Eighteenth and Columbia Road. The cost of such reconstruction work was at the rate of approximately $134,000 per mile of single track. This is 2.5 to 3 times more than the pre-war cost of similar work.

The total amount spent for maintenance and improvement of way and structures was $1,136,277. During the year 112,913,416 passengers were carried, of whom 25,130,632 were handled on transfers. As compared with the previous year, the number of revenue passengers decreased 4,408,575 or 4.78 per cent.

Refunding Provision Proposed

A bill has been introduced in the present session of the Legislature at Olympia, Wash., by Senator Fred W. Hastings of King County providing for the refunding of utility bonds. The measure says:

> Sec. 1. Cities and towns are hereby authorized to refund public utility bonds issued according to law in such manner, for such time and upon such terms and rates of interest as the legislative authority of such city or town may deem advisable. The rate of interest upon such refunding bonds shall not, however, exceed the maximum rate authorized by law at the time of such redemption for utility bonds, and where said bonds so refunded constitute a general obligation of such city or town, said refunding bonds shall not be deemed the creation of a new or an additional indebtedness of such city or town.

Mayor Hugh M. Caldwell is opposed to the passage of any such measure. He states that it would enhance the value of the $15,000,000 of bonds issued by the city for the purchase of the local railway from the Puget Sound Traction, Light & Power Company by making it possible for the city to pay the principal from some source other than the earnings of the road.

Mayor Caldwell in session with members of the City Council finally succeeded in having it agreed to recommend that a provision be written into the bill that bonds issued prior to passage of the act should not be so refunded. This would eliminate the railway bond issue.

Assistant Corporation Counsel Evans, in discussing the bill, said:

> The bill was prepared so as to permit the city of Seattle to refund any installment of the special fund railway bonds at maturity that it may not be able to meet from the earnings of the system. The outstanding bonds would be surrendered for cancellation and new special fund utility bonds can be issued to replace them. The terms of the new bonds may be fixed by the City Council, except that they will have to be made payable solely from the earnings of the street cars.
>
> The refunding bonds would not constitute a general obligation any more than in my judgment do the existing bonds. The bill if passed would have the effect of permitting the city a longer time in which to meet the purchase price of the street car system should that be found necessary. These refunding bonds would bear an attractive interest rate and would be sold if necessary on the open market.

Default Narrowly Averted

Financial Difficulties of Company at Albany Due to Cost Increase Compared with Income

The intercorporate relations of the United Traction Company, Albany, N. Y., the Hudson Valley Railway and the Delaware & Hudson Company received considerable attention at the hands of the Public Service Commission for the Second District of New York in the decision by that body on Jan. 21 in the matter of fares, referred to at length in the ELECTRIC RAILWAY JOURNAL for Jan. 29.

The commission says that in view of the financial condition of the Hudson Valley Railway there has been during the whole period since the Hudson Valley securities were acquired a strong possibility that much of the indebtedness of that company will never be paid. The process of one company borrowing from the other is characterized as a movement in a circle: The Hudson Valley Railway borrowed money from the United Traction Company to meet its obligations, including interest due that company; the traction company in turn used the interest received from the Hudson Valley to pay dividends on stock owned by the Delaware & Hudson Company and then borrowed from the Delaware & Hudson Company to loan to the Hudson Valley Company.

The commission says, however, that from any evidence at hand the conclusion is inescapable that the United Traction Company's present troubles, while they may have been somewhat aggravated by improper or mistaken management in the past, are fundamentally due to an increase in operating costs out of all proportion to the increase in revenue from passenger traffic.

In referring to the purchase of the Hudson Valley Railway by the United Traction Company the commission said:

> The most that can be said therefore, of the Hudson Valley purchase as affecting the United Traction Company's financial condition today is that if the Hudson Valley purchase had not been made and the traction company had continued to pay dividends only at the old rate on the old capital stock the traction company would be not quite so far behind, but would be in just exactly as much need as it is today of increased revenue to meet current costs of operation.
>
> Of course, if the Hudson Valley Company failed to meet its obligations and the Delaware & Hudson Company should try to collect its loans from the United Traction Company, that would be a different story, but the facts are so clear that there is not the slightest prospect that the Delaware & Hudson Company could make the United Traction Company riders pay the Hudson Valley losses in any such fashion. It is fair to say that there is no evidence of any attempt by the company to charge Hudson Valley losses directly or indirectly to United Traction operations. The difference between the increase during 1918 in loans from the United Traction Company to the Hudson Valley Company, $1,841,093, and the increase in loans from the Delaware & Hudson Company to the United Traction Company, $2,132,241, is $291,149 which is about offset by the increase in "construction work in progress," $149,532, and in corporate deficit, $132,734. Those two items together amount to $282,266. In other words, the Delaware & Hudson Company may be said to have financed the traction company's maintenance work and its net losses, in addition to carrying the Hudson Valley.

Merger Proposed

Interstate Public Service Proposes to Take Over Louisville & Southern Indiana Traction Company

Stockholders of the Louisville & Southern Indian Traction Company will meet in Indianapolis, Ind., shortly, to consider and vote on a proposal to ratify the action of the company directors in entering into a contract for the sale of all the property and assets of the company to the Interstate Public Service Company. Stockholders of the Louisville & Northern Railway & Lighting Company will take similar action. The Interstate company, it is understood, owns a majority of the stock in the other two companies, either directly or through its officers and directors.

The Louisville & Southern Indiana Company took over the property of the Rapid Transit Company, organized twenty years ago, to build an interurban road between Jeffersonville and New Albany, Ind. Later the Louisville & Southern Indiana obtained entrance into Louisville by way of the Big Four bridge at Jeffersonville, building approaches on each side of the river. Then the Louisville & Northern company was organized and built lines out to Charlestown and Sellersburg. At the latter city it connected with the Indianapolis & Louisville Traction Company, which built south from Seymour, where it connected with the Indianapolis, Columbus & Southern, the pioneer interurban of Indiana. The Louisville & Northern also obtained entrance into Louisville bridge by way of the Kentucky & Indiana bridge at New Albany.

The Interstate Public Service Company was organized later as a holding company. Besides the two interurbans, it has bought the Indianapolis & Louisville and leased the Indianapolis, Columbus & Southern for a long period, giving unified service between these cities and Indianapolis. The company owns a water power plant at Williams, Lawrence County, and soon will obtain power from a hydro-electric plant at Keokuk, Ia. It owns the controlling interest in the United Gas & Electric Company, supplying Jeffersonville, New Albany and Corydon, Ind., with gas and electricity, and also owns public utility plants in many other towns of Southern Ind. Harry Reid, president of the company, is moving from Louisville to Indianapolis, the headquarters of the company.

New Officers for Interurban

F. E. Myers, Ashland, who has been president of the Cleveland, Southwestern & Columbus Railway, Willoughby, Ohio, for many years, has resigned to give practically his entire attention to his business at Ashland, including the Ashland Pump & Hay Tool Works and the Faultless Rubber Company, while four prominent Cleveland bankers have been elected to the board of directors.

The reorganized directorate consists of F. E. Myers, chairman; Warren Bicknell, who represents the Union Trust Company; L. J. Wolf, P. A. Myers, E. B. Greene, vice-president the Cleveland Trust Company; Judge W. B. Thompson of Lorain; Otto Miller of Hayden, Miller & Company; H. C. Robinson, vice-president of the Guardian Savings & Trust Company; J. O. Wilson, F. L. Fuller, F. T. Pomeroy, L. M. Coe, North Olmsted; W. E. Haines, secretary of the Ohio Farmers' Insurance Company of Le Roy, and E. F. Schneider.

The directors elected L. J. Wolf, first vice-president; J. O. Wilson, second vice-president and treasurer, and F. T. Pomeroy, third vice-president and secretary. A committee was appointed to elect a president and a report is expected within a few days.

Members of the executive committee are Warren Bicknell, L. J. Wolf and F. T. Pomeroy with F. E. Myers, chairman of the board, and the president when elected as ex-officio members.

I. R. T. Fails to Earn Cost of Service

The comparative income statement of the Interborough Rapid Transit Company for the month of December, 1920, shows a deficit of $301,403. Compared with the deficit of a year ago this figure is alarming. If this be true of the one-month showing it is doubly alarming in the six months' statement. Since July, 1920, operations show a loss of $2,682,760 which is a greater figure than shown in the report of the company for the fiscal year ended June 30 last. At that time the deficit was recorded as $2,235,835. Although the gross operating revenues have increased during the last six months the steady rise in operating expenses has offset this increase by 7 per cent.

City Would Audit Books at New Orleans

Paul Malony, Commissioner of Public Utilities of the city of New Orleans, has asked an audit of the books of the New Orleans Railway & Light Company, and to this end has requested Gov. John M. Parker to assign the state auditor of public accounts to the task.

The purpose of the audit is to give the public and the city some information about the disposition of the 2 extra cents, in the 8-cent fare which the company was permitted to charge for a period of six months ending in April, with the explicit stipulation that the 2 cents were to go to the payment of wages and taxes.

The railway is now deliquent in both the city and state taxes for 1920. Its failure to pay the city taxes of $600,000, on the grounds that it did not have the money is the reason given by the city for the step to be taken to examine the books.

$8,439,400 of Securities Sold by Utility to Its Customers in 1920

Complete figures of the local or customer-ownership sales of securities at the properties of Standard Gas & Electric Company Chicago, Ill., during 1920 show a total par value of $8,439,400 thus distributed. Of this amount $6,343,050 was represented by the preferred stocks of the various subsidiaries and $2,096,350 by round notes and other securities of Byllesby companies. Preferred stock sales were much greater than during any year since the customer-ownership plan of financing was inaugurated. About 25 per cent of the investors in such securities were purchased on the partial payment plan.

SUMMARY OF EARNINGS OF INTERBOROUGH RAPID TRANSIT COMPANY

Month Ended Dec. 31	1920	1919	Percentage Change Over 1919
Gross operating revenue	$4,980,072	$4,668,268	6.7
Operating expenses	3,235,854	2,855,951	13.3
Net operating revenue	$1,744,218	$1,812,317	—3.8
Total taxes	220,831	228,556	—3.4
Income from operation	$1,523,387	$1,583,761	—3.8
Non-operating income	56,093	53,988	3.9
Gross income	$1,579,480	$1,637,749	—3.6
Interest, rentals, etc., including Manhattan guarantee	1,880,883	1,659,919	13.3
Net corporate income (exclusive of accruals under the provisions of Contract No. 3 and related Certificates which under these agreements with the City are payable from future earnings	*$301,403	*$22,170	—1260.1
Operating ratio (per cent)	65.0	61.2	3.8
Passengers carried (revenue)	90,522,590	84,771,977	6.8

Six Months Ended Dec. 31	1920	1919	Percentage Change Over 1919
Gross operating revenue	$26,969,396	$24,200,226	11.4
Operating expenses	18,034,299	15,175,220	18.9
Net operating revenue	$8,935,097	$9,025,006	— 1.0
Total taxes	1,311,268	1,297,516	1.1
Income from operation	$7,623,828	$7,727,489	— 1.3
Non-operating income	316,253	271,929	16.3
Gross income	$7,940,082	$7,999,419	— 0.7
Interest, rentals, etc., including Manhattan guarantee	10,622,842	9,919,785	7.1
Net corporate income (exclusive of accruals under the provisions of Contract No. 3 and related Certificates which under these agreements with the City are payable from future earnings	*$2,682,760	*$1,920,366	—39.7
Operating ratio (per cent)	66.9	62.7	4.2
Passengers carried (revenue)	496,595,522	445,396,934	11.5

* Deficit.

Ohio Electric Collateral Sold for $25,000

A lot of securities including collateral notes, coupons overdue and bonds and stocks of the Ohio Electric Railway and bonds of the Columbus Interurban Terminal Company and the Columbus, Newark & Zanesville Electric Railway and all equity in collateral pledged by the Ohio syndicate was sold at auction at Philadelphia, Pa., on Jan. 12 for $25.000.

Letters were received on Jan. 7 by members of the participating syndicate in the Ohio Electric Railway system advising them that the securities owned by the syndicate would be sold at auction on Jan. 12. The collateral was sold to raise funds to pay off the indebtedness of the syndicate, the securities having been put up as collateral against the notes of the syndicate.

It is understood that the indebtedness of the syndicate is about $3,500,-000.

The letters notifying the syndicate members of the proposed sale came from Erwin & Company, Philadelphia, the syndicate managers.

Financial News Notes

$11,215 Lost at Henderson.—In the annual report to the Common Council of the city of Henderson the Henderson (Ky.) Traction Company reports a loss of $11,215 for the year 1920. The present far is 7 cents, with four tickets for 25 cents. The company asks in its report some method of relief in order to operate.

Preferred Stock Quickly Sold.—The syndicate of banking houses headed by Nesbitt, Thomson & Company, which took the issue of $3,000,000 of 7 per cent cumulative preferred stock of the Winnipeg (Man.) Electric Railway, have announced the closing of the subscription lists. This is the first large public utility issue sold in Canada since the war.

Discontinuance of Puyallup Line Allowed.—By order of the Public Service Commission the Puget Sound Electric Railway, Tacoma, Wash., is permitted to discontinue service on the old Puyallup line from Summit to Fruitland. It is stated that revenues on the line during the trial period of three months ended Dec. 31 were only $141.11, as against expenses of $499.10, exclusive of depreciation.

Earnings Increase Under Eight-Cent Fare.—The revenue of the New Orleans Railway & Light Company, New Orleans, La., under the 8-cent fare for the months of October, November and December increased $321,000. Increases in wages for the same period were approximately $42,000. The number of passengers during this interval fell off monthly about 7 per cent. A complete survey of the company's earnings now being made will soon be ready for submission to Commissioner Maloney.

Increase in Capital Asked.—The Bristol & Plainville Tramway, operating about 15 miles of electric railway in Bristol, Plainville and Terryville, Conn., and supplying industries with electric power, has petitioned the State Legislature for permission to increase its capital stock from $1,000,000 to $5,-000,000. The additional capital will provide for business expansion as conditions warrant it, especially for the distribution of electric power. Not all the proposed increase will be used at once.

Property Sold For Taxes.—Harry Reinhard, North Adams, Mass., a real estate and insurance dealer, was the purchaser of real estate owned by the Berkshire Street Railway in Williamstown at public auction for $1,475. The sale was held to satisfy unpaid taxes for the past three years, totaling $1,216.39. The sale of personal property owned by the company in Williamstown was postponed. Mr. Reinhard purchased the Hoosac Valley park property of the Berkshire company at a tax auction sale held on Aug. 21 last.

Franchise Declared Forfeited.—The Board of Estimate of New York City has declared forfeited the franchise of New York & North Shore Traction Company, which formerly operated on the north shore of Long Island in the Borough of Queens. The franchises were forfeited on the ground that the company ceased operation of the lines last May, and also owes the city a large sum of money for franchise taxes. The company is now in the hands of receivers, appointed by Judge Chatfield of the Federal court in Brooklyn.

Citizens Plan to Continue Line.—The Stoughton Railway Corporation, operating between Stoughton and Randolph, Mass., which was to have discontinued service on Jan. 22, has been taken over by business men in the vicinity of Randolph and Stoughton and operation of cars is assured. The holder of the mortgage on the property was the highest bidder for the equipment at foreclosure. Temporary officers have been elected. The line was formerly known as the Norfolk & Bristol Street Railway, a Massachusetts corporation, which was sold at public auction on Oct. 23 last.

Effort Made to Amend Valuation Act.—Senator Mackay has introduced a bill in the New Jersey Legislature providing for a court of review of the valuation of the electric railways that are being appraised under an act of last year. That measure placed these valuation under control of a special commission independent of the utilities board. This commission consists of the Governor, the State Comptroller and the State Treasurer, but Governor Edwards, declaring the act was a political measure, refused to serve and State Comptroller N. A. K. Bugbee and State Treasurer William T. Read are acting as the commission.

A Finite Court.—Some elementary facts in regard to the methods of foreclosure and sale and the winding up of receivership are stated by Judge Julius M. Mayer of the Federal court at New York in answer to Senator Harris of Brooklyn. Legislators of that borough recently decided among themselves that it was about time the receivership of the Brooklyn Rapid Transit Company was ended and sought to confer with the court about the matter. The court explained that there was a multiplicity of claims against the company; that the only thing the court could do to hasten the time for ending the receivership was to dispose of all matters ready for its consideration; that it was doing this, and that "I cannot, therefore answer your query any more definitely." An inquiry into the affairs of the company by Congress has since been proposed.

Removing Prohibition to Merger.—By a vote of thirteen to one on Jan. 26 the District of Columbia Committee of the House of Representatives instructed Representative Gould, New York, to draft and report favorably to the House a bill removing the statutory prohibition against the consolidation of the Washington Railway & Electric Company and the Potomac Electric Power Company. A committee of five was also authorized to draw up a bill looking toward the merger of the Washington Railway & Electric Company and the Capital Traction Company. It was pointed out that it would be unfair to the Capital Traction Company to ask it to put its property into the pool if the Washington Railway & Electric Company were allowed to hold out of the merger its most valuable asset, the Potomac Electric Power Company.

Personal Claimants Question Validity of Bonds.—Charges that the first and second mortgage bonds of the Kansas City (Mo.) Railways, amounting to $32,903,000, are invalid and void because they were issued in violation of a constitutional statute of the state, which prohibits a mortgaged indebtedness in excess of the capital stock, have been made in an answering petition filed in the United States district clerk's office by sixty-two personal injury claimants of the railway. The petition was filed by Harry G. Kyle, attorney for personal injury claimants. It was in answer to the intervening petition and bill to foreclose filed two months ago, following the admission of insolvency of the railway by the Continental & Commerce Trust & Savings Bank and Edward F. Swinney, trustee.

Traffic and Transportation

Would Restrain City

Louisville Railway Seeks Injunction to Prevent Interference with Increase in Fare to 7 Cents

The Louisville (Ky.) Railway on Jan. 27 filed with the United States District Court at Louisville a petition for an injunction to restrain the city authorities from interfering with the collection by the company of a 7-cent fare. This action followed closely the rejection by the City Council of an ordinance granting the railway an increase in rates. If the injunction is granted the company states its intention immediately to begin charging the 7-cent fare, with free transfers. The fare is now 5 cents.

Demand Suit Be Speeded

Efforts are being made by representatives of both the city and the railway to have the suit heard as soon as possible by Federal Judge Walter Evans. Mayor Smith personally has favored the increase in fare, and has so stated in the press. However, the City Council has refused to grant the increase, although the Board of Aldermen has voted in favor of it. The Board of Trade and a number of civic organizations favored the higher-fare plan. Sixty-odd labor union locals and a number of welfare and suburban organizations opposed it.

James P. Barnes, president of the railway, outlined the attitude of the management as follows:

> The officers and directors of the Louisville Railway believe that company to be under a three-fold obligation:
>
> First—To render adequate service to the public of Louisville.
>
> Second—To maintain an adequate living wage scale for its employees.
>
> Third—To pay a reasonable rate of return to the investors in securities upon the amount invested in property used in the service of the company.
>
> We believe also that the company has the right to command means of carrying out these obligations by a sufficient charge for service rendered. In this belief the company is seeking relief in the federal courts under that clause of the United States Constitution which insures to the citizens of this country that their property shall not be taken from them without due process of law. At the present time the net earnings on the investment in the property of the Louisville Railway are less than 3½ per cent per annum, which is far below the legal interest rate and which in recent court decisions has been held confiscatory.
>
> **Court Only Recourse Left**
>
> In the month of December an advertisement was published over the signature of the president of this company announcing that one of two courses must be followed—etiher relief or retrenchment. Relief through the city's co-operation was refused by the rejection in the Board of Councilmen of the Wilson ordinance. We are, therefore, faced with the alternative of seeking relief through the courts or at once entering upon a program of retrenchment.
>
> We have chosen the alternative of seeking relief through the courts in order that the public may be spared the inconvenience and annoyance incident to curtailment of service which would otherwise be necessary.

The grounds given for asking for the injunction is that the operation of the car lines in Louisville under a 5-cent fare franchise does not yield sufficient revenue to meet the expenses of the company.

The railway company also sets forth claims that the rate-making power still exists in the city and contends that it is entitled to the reasonable exercise of this power, which again does not extend to the point of confiscation. In its petition the plaintiff traces out the legal and corporate history of the street car enterprise in Louisville. Specifically, the plaintiff claims it is operating under two classes of franchises, those granted to it direct by the city of Louisville and those purchased by it from the various street car companies that formerly operated in Louisville.

The Mayor at first refused to comment on the city's action. The city attorney on the other hand indicated that he would have a statement to make as soon as the suit was filed by the company.

Fast Through Service Between Indianapolis and Fort Wayne

At a conference of officials of the Union Traction Company of Indiana and the Indiana Service Corporation at Muncie recently it was decided to establish three new trains between Fort Wayne and Indianapolis. This fast through service via Anderson and Peru was inaugurated on Jan. 16. Through the newspapers the public was invited to submit names for the new trains, but on Jan. 15 no selection had been made, though probably a hundred names had been submitted.

Two trains will be operated through Muncie and the third by way of Peru. The first of the new trains will leave Fort Wayne at 6:30 a.m. and will arrive in Muncie at 8:30 o'clock and in Indianapolis at 10:15. On the return trip it will leave Indianapolis at 5 p.m., arriving in Fort Wayne at 9 p.m.

The second train will leave Indianapolis at 7 a.m. and arrive at 11:10 a.m. in Fort Wayne. On the return trip it will leave Fort Wayne at 5:30 p.m., reaching Indianapolis at 9:30 p.m. These trains will make only county seat stops.

The third train, which now leaves Indianapolis at 7 o'clock in the morning and is run to Bluffton, will go to Fort Wayne, arriving there at 11:50 a.m. The car will leave Fort Wayne at noon and arrive in Indianapolis at 4:15 p.m. This car will be operated on regular limited time.

The Union Traction Company of Indiana and the Indiana Service Corporation are jointly inaugurating this service to compete with the service of the steam railroads between Indianapolis and Fort Wayne.

Joint Use Ordered

Commission Order Expected to Relieve Congestion in Milwaukee—Rentals a Problem

The Wisconsin Railroad Commission has directed the joint use of tracks on Wells Street in the City of Milwaukee by the Milwaukee Electric Railway & Light Company, the Milwaukee Northern Railway and the Chicago, North Shore & Milwaukee Railroad. The commission retains jurisdiction and will settle the compensation to be paid by the companies for the use of the tracks. Thirty days are given to appeal.

The order is expected to permit the routing of one or more of the lines of the Milwaukee Electric Railway & Light Company over Wells Street below Eleventh Street, thus relieving traffic congestion on Grand Avenue and its continuation, Wisconsin Street, the main business street of the city. Wells Street parallels Grand Avenue.

The Railroad Commission's order is similar to the one it issued on Dec. 1, 1913 (13 W. R. C. R. 268, 299). At the time, however, it embodied in it a provision under which the companies concerned were authorized to examine each other's books and records for the purpose of verifying the accuracy of statements rendered or claims made pursuant to the terms of the agreement. This provision resulted in prolonged litigation. Finally, some months ago, the courts held that the commission had exceeded its powers in that respect. The commission thereupon once more considered the matter and issued the present order. The new order omits that portion of the previous order relating to the examination of books and records.

When the matter was under consideration in 1913 the Milwaukee Electric Railway & Light Company was granted permission by the City Council to extend its tracks on Wells Street from Eleventh Street down. This was done at a considerable expense, but because of the ensuing litigation the tracks have lain idle ever since. Between Sixth and Second Streets on Wells Street there are tracks of the Milwaukee Northern and the Chicago, North Shore & Milwaukee roads.

Mayor Hoan of Milwaukee has urged upon the Railroad Commission the need of withdrawing some of the railway traffic from Grand Avenue and from Wisconsin Street, pointing out that, due in a large measure to the increased use of automobiles, congestion on this thoroughfare has been greatly intensified within the past few years until it has become a constant menace to life and limb.

The Railroad Commission is asked to enter an order for the proposed rerouting. Immediate rerouting of street cars is also urged in a letter to the Railroad Commission by the Milwaukee Safety Commission. On the other hand, Grand Avenue merchants, who opposed taking cars off Grand Avenue when the matter was considered some years ago, are expected to take the same stand at this time.

Flexible Fares Criticised

City Club of New York Opposed to Flexible Rate of Fare Dependent on Cost of Service

The City Club of New York has issued a comprehensive report on flexible fares for street railways. This report, which represents an exhaustive study of the flexible fare idea by the club's committee on public service, points out that Governor Miller's traction program, while it calls for a uniform fare throughout the city at any given time, is based upon the idea that the fare will fluctuate from time to time according to the cost of the service.

THE report traces the spread of the service-at-cost idea in recent years as a means of giving relief to hard-pressed traction companies in many cities. It declares that flexible fares cannot be applied in any community except where all traction lines are combined and operated as a unit and that the thirty-five operating companies and receiverships in New York City create a competitive condition that makes the flexible fare plan impossible.

For example if the fare on the surface lines was more than on the subway competition would immediately assume much importance and subway traffic would be increased at the expense of the surface lines. The non-paying surface lines would be worse off by the very fare increases destined for their relief. The same would be true if the B. R. T. subways charged one rate of fare and the Interborough another. The report says that such a consolidation could not be effected by voluntary agreement except at a prohibitive cost. No group of security holders will consent to give up the advantages they hold, and so a voluntary consolidation would have to be based on giving every group whatever it asks as the price of its consent to go into the combination.

FLEXIBLE FARE OPPOSED

The report says that the Governor's proposed commission will be in a position to surrender public rights only. It will not be able to bring about a surrender of private rights except by negotiations and persuasion.

Even if all the transit lines could be consolidated, the adoption of the flexible fare scheme would involve issues of grave moment to the city, says the report. One of these, is the question of the social importance of cheap transit. The city's policy, as embodied in the subway contracts, included low fares as a means of spreading out population and relieving conditions from which New York has suffered for more than half a century. The city has already pledged hundreds of millions of dollars to the maintenance of this policy. The flexible fare scheme would reverse it, and would allow the fares to be increased to any point which might be necessary to make the transit lines self-sustaining regardless of the effect of the high fares on the community's welfare. The flexible fare scheme would make fare-fixing a fiscal matter pure and simple, and divorce it entirely from any general consideration of municipal policy with respect to community development. Under such a plan the railway companies would be entirely relieved of their obligation to provide the service at reasonable rates to the public; they would lose their character as public utilities and become private enterprises privileged to use the streets to exploit for private gain the transportation needs of the public up to the full amount of the return upon the investment fixed in the contracts.

WATER STILL PRESENT

The report calls attention to the fact that in a service-at-cost plant, a valuation would have to be agreed upon. The difficulties of getting a figure accepted that would be fair to the public are as great as the difficulties affecting a voluntary consolidation of the existing diverse interests without excessive cost. Generally, the companies have taken on obligations which make it impossible for them voluntarily to accept a valuation that would be fair to the public, and the flexible fare or service-at-cost will necessarily be a failure unless the valuation is in fact conservative and accepted as such by the public.

Governor Miller states that already the water has been squeezed out of the traction securities, continues the report. He refers to their market value. But the incorporation of the flexible fare plan would relieve the companies of their franchise obligations and give them the right to charge at all times adequate fares to yield a full return upon the value of their property. This would in itself restore the franchise values. The franchises would no longer be liabilities, but of great value with their perpetual rights freed from contractual restrictions. It is of vast importance, therefore, that the value of the properties should be fixed under the existing franchises, before the flexible fare scheme is embodied in the law of the state.

CLUB AT ODDS WITH GOVERNOR

The most important general objection to service-at-cost arrangement, says the report, is the difficulty of preserving proper incentives to economy and efficiency in operation. The private owners supply the management, at a fixed rate of profit. If the management is good the profit is just the same as if it is bad. The various schemes so far devised for overcoming this difficulty and restoring the incentive have not worked out in practice, and this particular trouble remains the despair of the whole flexible fare program.

With respect to the transit commission, the club takes issue with the Governor on the question of home rule. The club maintains that transit is primarily a local problem and that no plan formulated by such a commission as the Governor proposes should take effect until after it has received the approval of the Board of Estimate or else of the voters of the city at a referendum election.

Jitneys Return at Davenport

Men Unemployed Again Start Cars After City Council Nullifies Previous Regulations

The jitney bus menace, serious several years ago and since then eliminated both by law and by business conditions, has returned again to trouble the Tri-City Railway and has assumed such proportions that B. J. Denman, president of that company, has threatened to run the cars into the carhouses if the authorities do not take some action to curb the competition of the jitneys.

UNEMPLOYED RUN AUTOS

It has not been any act of the traction lines which brought about the present development of the bus lines. Factory shut-downs and lack of work, coupled with the antagonism of the City Council to the utility corporation, are responsible.

Laboring men laid off who had bought autos during the recent years of prosperity got the idea of turning their machines into an earning agency. Then along came the present City Council and rescinded an ordinance passed several years ago which placed such a heavy bond on the jitneys that they were forced out of business. This ordinance had also prescribed continuous operation, following of certain definite routes, a uniform fare of 5 cents and other requirements.

The traction lines charge a cash fare of 9 cents and the jitneys charge 10 cents. No bond protects the passenger in case of accident. The jitneys time their arrival at loading points and pick up passengers waiting for street cars.

Several buses are now operating between Davenport and Rock Island in defiance of an order of the Illinois Public Utility Commission. The Tri-City Railway has placed its case in Illinois in the hands of Attorney C. J. Searle, Rock Island, and will shortly commence action for compliance with the commission's order.

RADICALS IN POWER

In Davenport action is uncertain as little relief can be expected of the present councilmen and the only manner in which a show-down can be forced is through such a threat as President Denman has made. Taxes of the Tri-City Railway of Iowa, if apportioned to the number of street cars in operation, would mean a monthly tax of $40 on each car. The jitneys are taking a large amount of business from these cars, are running over paving which the traction lines have laid, are charging a higher fare, operating only during the traffic peaks and without bonds, and are paying an annual license fee of only $10.

Separate Cars for Women Again Urged

Trolley cars for the exclusive use of women during rush hours are provided in a bill introduced by Senator George M. Reischmann and Assemblyman John O. Gempler of New York. The measure authorizes the Public Service Commission to designate a minimum number of cars for such use.

Under the public-be-pleased policy of William G. McAdoo as president of the Hudson & Manhattan Railroad separate cars for women were operated on that road for a time, but were dispensed with after the experiment had proved them impracticable. The use of such cars on the lines in New York was also urged before the Public Service Commission but that body decided against them on the basis of the testimony presented.

Higher Fare Trend Continues

Only Thirty-four Cities with 25,000 or More Population Retain Five-Cent Charge

The upward movement of rates of fare continues, as shown by statistics compiled by the information bureau of the American Electric Railway Association giving the rates in effect on Dec. 31, 1920, in the 288 cities of the United States having a population of 25,000 or more.

Since the statement showing the rates in effect on Dec. 1 nine cities have been added to the forty-eight which were then in a 10-cent base rate, making a total of fifty-seven; cities in the 9-cent group have increased from two to four; the 8-cent cities decreased from twenty-eight to twenty-three; 7-cent cities increased from eighty-four to eighty-nine; 6-cent cities increased from fifty-six to sixty-one; and the number of 5-cent cities decreased from fifty-two to thirty-four. Five 8-cent fare cities have increased their rates since December, placing them in the higher fare groups, which explains the decrease shown in 8-cent fare cities.

At the close of 1917 there were 263 cities having a 5-cent fare; in 1918, 123; in 1919, eighty-three; and at the close of 1920 only thirty-four. In 1917 there were no cities charging a 7-cent fare; in 1918 there were thirty-three; in 1919, sixty-four, and at the end of 1920, eighty-nine. During 1917 and 1918 no city in the United States was on a 10-cent base rate; in 1919 there were twenty-five, and at the close of 1920, fifty-seven.

The comparison also shows a marked decrease in the number of cities operating under zone systems during the past year.

The accompanying summary shows the rates in effect during the four years, 1917 to 1920, and the fare situation in each city during this period.

SUMMARY OF RATES OF FARE IN EFFECT AT THE CLOSE OF THE YEARS 1917, 1918, 1919 AND 1920, IN THE 288 CITIES OF THE UNITED STATES HAVING A POPULATION OF 25,000 OR MORE

Rate of Fare	1917 Number of Cities	1918 Number of Cities	1919 Number of Cities	1920 Number of Cities
10-cent cash fare	..	..	25	57
9-cent cash fare	..	..	1	4
8-cent cash fare	..	12	12	23
7-cent cash fare	..	33	64	89
6-cent cash fare	25	78	73	61
Central area zone system with outlying "copper" zones	1	13	4	2
5-cent fare with charge for transfers	1	8	4	1
Uniform rate zone systems	4	6	14	11
5-cent reduced rate tickets abolished	5	27	20	18
Original 5-cent fare (no increase)	*264	123	83	34
Total	300	300	300	300

Note—The difference between the above total of 300 and the 288 cities is accounted for by the fact that in the following cities more than one company operates: New York, N. Y., eight companies; Chicago, Ill., two companies; Tacoma, Wash., two companies — total twelve companies. * Includes 4-cent fare in Cleveland.

City Restrained by Duluth Street Railway

Judge Page Morris in Federal Court at Duluth, Minn., on Feb. 1, granted the application of the Duluth Street Railway for a temporary restraining order to prevent the city of Duluth from acting on the resolution adopted an hour earlier by the City Council authorizing the City Attorney to take legal action to force better electric railway service by the railway. The restraining order is returnable on Feb. 3 at which time arguments will be presented for and against the temporary injunction. The claim of the railway is that the injunction is necessary to protect the rights of the company. On Jan. 10 the City Council adopted a resolution directing the city attorney to proceed by mandamus action in District Court.

The company, in its latest move, contends that the city is acting in violation of its franchise contracts when it attempts to regulate the operation of cars. The company, in a complaint filed in the Federal Court, also raises the question of expense, pointing out that operating expenses under the increased service would be advanced approximately $340,000 a year over what the company has been spending.

Nashville Survey Begun

Work was begun on Jan. 24 by Ross W. Harris, Madison, Wis., on a traffic survey of the city railway conditions in Nashville along lines similar to the survey which Mr. Harris made in 1920 of railway conditions in Memphis. Mr. Harris was retained for the work in Nashville by the city of Nashville and the Nashville Railway & Light Company. The survey at Nashville was ordered by the Tennessee Railroad & Public Utilities Commission. The fact that the survey would be made was referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 29, page 246.

Transportation News Notes

Mayor Seeks Nickel Fare.—Mayor Benjamin Bosse of Evansville, Ind., in his annual message to the City Council, recently asked that the city be authorized to appeal to the Indiana Public Service Commission for a reduction in the fare charged on the city lines to 5 cents. The Evansville Railways, a subsidiary of the Evansville & Ohio Valley Railway, is now charging a 6-cent fare. The members of the City Council have assured Mayor Bosse that they will back up his demand to the Public Service Commission.

New Express and Freight Rates Filed.—The Puget Sound Electric Railway, Seattle, Wash., which owns and operates the Seattle-Everett interurban, recently filed with the Public Service Commission new express rates, effective on Feb. 10. W. H. Somers, traffic manager of the company states the new rates makes some reductions and some increases, but mainly establishes three basic classes. Rates in some of these classes will include points within a 10-mile radius from Seattle; a second class will include points within a 20-mile radius and the last class within a 30-mile radius. The highest increase sought is on first and second class express rates to Everett. Rates on first class commodities, now 71-cents a hundred pounds, will be raised to 80 cents. Rates on commodities carrying a second class charge will be raised from 55 to 60 cents a hundred pounds.

Fare Increase Refused.—The State Board of Public Utility Commissioners has denied the application of the New Jersey & Pennsylvania Traction Company, Trenton, N. J., for an increase of 1 cent in each of the four zones between Trenton and Princeton. The company now collects 7 cents in each zone. The commission permitted the company to put into effect a 40 per cent increase in commodity freight rates and a 20 per cent increase in package express tariffs. In refusing the fare advance the board said: "It seems the passenger rates as proposed will result in a loss of passenger traffic to such an extent as to negative the increase in revenue if the proposed rate is allowed. It is apparent that the immediate result of each of the past increases in passenger fare has been a material falling off in number of passengers carried. Such an increase in passenger rates as petitioner now desires would not in our judgment improve the present financial condition of the company and would not give the company a fair and reasonable return on the value of its property used and useful in the public interest."

Personal Mention

The "Aisne" Marks the Passing of Hog Island

Hog Island, where the American International Shipbuilding Corporation built 122 ships for Uncle Sam, was a wonderful achievement. Today it lies idle, a monument to human and national energy, its future uncertain. In a way, it seems to symbolize the waste of energy which was one of the great but necessary features of the world war.

There, along the shore of the Delaware River, stand great gaunt structures, ways for the fabrication of fifty ships at a time. A little further down the river project a dozen or so outfitting piers. Huge plants housing machinery and stores stand back ready to feed the construction. A wonderful machine, which performed its service well. Will it ever perform again? This questionnaire remains unanswered.

These remarks are inspired by a recent memorable and enjoyable visit to Hog Island. Electric railway men all know "Matt" Brush, of former Boston Elevated Railway fame, who stepped in as president of the American International at a critical period and succeeded in engineering record shipbuilding.

Mr. Brush has just turned over his responsibilities to the Shipping Board. But he had one last ship to test. The *Aisne*, United States Army Transport, the one hundred and twenty-second and last ship to be launched at Hog Island, had to have her trial run and "Matt" and his coworkers made this the occasion for a fine party. However significant this trip of the last ship may have been, the party was no funeral.

Landlubbers (railway friends of "Matt") whose principal business is piloting street cars, saw no reason to be sorrowful but found ways of making themselves happy aboard the new craft. Maybe they were fearful for the time when an unfeeling public might let their rail systems of transportation lie, unappreciative of the past service rendered and existing intrinsic value, and were taking one final opportunity for a good time and to forget troubles at home.

B. A. Enloe Is Chairman of Tennessee Commission

The State Railroad & Public Utilities Commission of Tennessee has organized for the ensuing two years by electing B. A. Enloe chairman. Julian Campbell, new Republican member from Columbia. Tenn., who had been previously sworn in to succeed George Welch, participated in the organization. Mr. Enloe is a former member of Congress. He has been editor of daily papers in both Louisville and Nashville.

Transportation Chair Filled

S. W. Dudley, Westinghouse Air Brake Engineer, Named to Strathcona Professorship at Yale University

Samuel W. Dudley, well known as an authority in both steam and electric railway circles on matters pertaining to train and traction control, retired on Feb. 1 as chief engineer of the Westinghouse Air Brake Company to accept a professorship in Mechanical Engineering in the Sheffield Scientific School, Yale University. This is one of the professorships supported by a bequest of $600,000 from the late Lord Strathcona, Canadian railway pioneer, in an effort to establish at Yale a department devoted to instruction in the economic as well as the physical agencies of transportation. In taking a broad conception of this problem, Yale has decided to correlate all the different phases under one department, rather than to deal with the various aspects under separate heads.

S. W. DUDLEY

Starting in with the Westinghouse Air Brake Company as a special apprentice, Mr. Dudley spent the summer of that year and the next in the pattern and foundry shops and the test department, later returning to school to complete a post-graduate course. He then became attached to the office of the late Walter V. Turner, then mechanical engineer of the Westinghouse Air Brake Company. Here he had his first opportunity to deal with problems of train control in a thoroughly practical manner, being assigned as a member of the party in charge of the first road test of the type "R" triple valve between Pittsburgh and Fairchance on the Pennsylvania Railroad. Later he acted as engineer's assistant during a series of important demonstrations of the "ET" equipment and the type "R" passenger triple valve on the New York Central. He was charged with the responsibility of preparing much of the data relating to these demonstrations, which resulted in the development of the high emergency retained features which were added to the type "R" triple valve to complete type "L," later adopted for the motor cars of the New York Central's electrified zones.

In 1906 Mr. Dudley was assigned to the New York office to follow the installation, operation and maintenance of the new air brake equipment that was placed in service on electric locomotives and motor cars during the inauguration of the New York Central's terminal electrification. A year later he was called back to Wilmerding to take charge of the publicity department where he remained until 1909. He was then appointed assistant mechanical engineer.

Another promotion came in 1910, when he was made assistant chief engineer. In 1914 he was advanced to the position of chief engineer. For the past fifteen years Mr. Dudley's name has been before readers of the technical press in connection with articles devoted to air brake problems of universal interest in the transportation field.

Mr. Dudley is a member of the American Society of Mechanical Engineers, American Electric Railway Association, Engineers Society of Western Pennsylvania, the New York Railroad Club, and the Air Brake Association. He is a graduate of the Sheffield Scientific School, Yale, class of 1900.

Chairman of Illinois Commission Resigns

James H. Wilkerson, chairman of the Illinois Public Utility Commission, has resigned and will resume his law practice. This leaves only Commissioner Shaw and Dempcey, Commissioner Lucey having resigned to resume his law practice also and Commissioner Funk to go to Congress.

W. E. Cann, Toledo Commissioner

Wilfred E. Cann, for the past nine years assistant to the general manager of the Detroit (Mich.) United Railway, has been named Street Railway Commissioner of Toledo, Ohio. Mr. Cann was chosen for this position by the board of control, consisting of Henry C. Truesdall, W. W. Knight and D. H. Goodwillie. He was selected from among forty applicants who came forward as candidates for the position. His appointment took effect at midnight on Jan. 31, when the property of the Toledo Railways & Light Company was taken over by the Community Traction Company.

G. M. Cox Leaves Railway Field

George M. Cox, who resigned recently as treasurer of the Middlesex & Boston Street Railway, Newtonville, Mass., has joined the Boston Consolidated Gas Company, Boston, as assistant treasurer. Mr. Cox has been succeeded as treasurer of the Middlesex & Boston by Frank Frykstrand, formerly assistant treasurer. John A. Campbell has been promoted to assistant treasurer of the railway to succeed Mr. Frykstrand. Mr. Campbell has been in the employ of the Middlesex & Boston for the past fourteen years, having charge of the payroll department. Mr. Cox was born in Waltham, Mass., in 1866. He was graduated from the Pierce Grammar School in West Newton, in 1880 and from the Newton High School in 1884. He entered the employ of the Boston Suburban Electric Companies in 1902 as a bookkeeper. Two years later he was made chief clerk of the company and on Nov. 23, 1905, he was elected by the board of directors as assistant treasurer of the company's subsidiaries. He was later made treasurer of the Middlesex & Boston. For a number of years he has been a prominent member of the New England Street Railway Club.

G. S. Williams, Manager

George S. Williams is now general manager of the Androscoggin Electric Company, Lewiston, Me. In the issue of Jan. 8 it was stated that O. D. Mudgett had succeeded Frederick D. Gordon as general manager of the Lewiston property. Mr. Mudgett continues as superintendent of the power and light division of the company. The list of officials of the railway as at present constituted follows: Harvey D. Eaton, president; Walter S. Wyman, treasurer; George S. Williams, general manager; O. D. Mudgett, superintendent, power and light division; P. E. Weymouth, superintendent, railway division (Portland-Lewiston interurban).

F. E. Myers, Ashland, who has been president of the Cleveland, Southwestern & Columbus Railway, Willoughby, Ohio, for many years, has resigned to give practically his entire attention to his business at Ashland, including the Ashland Pump & Hay Tool Works and the Faultless Rubber Company.

Edward A. Boyd has been appointed master mechanic of the Bamberger Electric Railroad, Salt Lake City, Utah, to succeed M. L. Allen, who has been assigned to other duties. Mr. Boyd will make his headquarters at the railway's North Salt Lake shops, where he will direct the building of a number of passenger, express and freight cars. For six years Mr. Boyd was foreman of shops for the Utah-Idaho Central Railroad in Ogden. He has had considerable experience in the maintenance of electrical equipment, having had a number of years' service with the Sacramento Northern Railroad, Chico, Cal. He also served at one time or another with the Central California Traction Company and the San Francisco-Oakland Terminal Railways.

George N. Brown, formerly electrical engineer of the New York State Railways, Syracuse-Utica Lines, has been appointed district manager of the New York office of the Pittsburgh Transformer Company. Shortly after his graduation from Cornell University in 1908 Mr. Brown started railway work as inspector of car equipment with the Utica & Mohawk Valley Railway. In November, 1910, he became connected with the Boston & Maine Railroad, and took part in the Hoosac Tunnel electrification. He later served as switchboard operator in the North Adams power plant. In May, 1912, he became assistant engineer of the three lines which now form the Syracuse-Utica Division of the New York State Railways. He was later promoted to electrical engineer. Subsequently he became district manager for the Buffalo office of the Schiefer Electric Company, Rochester, N. Y.

W. B. Donaldson, purchasing agent, Seattle Division, Puget Sound Power & Light Company, Seattle, Wash., has been elected president of the Seattle Purchasing Agents' Association. Mr. Donaldson was born in Pittsburgh, Pa., in June, 1883. Going West in 1906 he entered the employ of the Seattle-Tacoma Power Company as a clerk. He was later transferred to the purchasing department, and in May, 1909, was appointed purchasing agent. This position he held until the consolidation of the Seattle-Tacoma Power Company and the Seattle Electric Company in April, 1912. He occupied the position of chief clerk in the purchasing department of the Puget Sound Traction, Light & Power Company until April, 1914, when he was advanced to assistant purchasing agent. The following year he was promoted to purchasing agent.

Frantz Herwig, director of the newly established Wisconsin Public Utilities Bureau, is by profession a newspaper man. Mr. Herwig attended the University of Michigan, but left college to enter the advertising department of the old Milwaukee *Daily News*. He was subsequently connected in various reportorial and editorial capacities with almost every newspaper in Milwaukee. His last newspaper work was on the Milwaukee *Sentinel* as director of the promotion department. He left the *Sentinel* to become executive secretary of the Milwaukee Pension Laws Commission and served in that capacity until called to his present post. Mr. Herwig's knowledge of the newspaper man's point of view and his acquaintance with the needs of the papers throughout Wisconsin will be a great asset to the holder of the position that he has just been called upon to fill. The bulletins so far issued by the Wisconsin Bureau have been well received by the press of the State. In some cases the matter used has been given front page display.

Obituary

John I. Stack, president of the Escanaba (Mich.) Traction Company, is dead.

Frederick H. Dunkak, a roadmaster of the Brooklyn (N. Y.) Rapid Transit Company, died suddenly from an attack of heart disease on Jan. 1. Mr. Dunkak was born in New York City. He had been in the employ of the B. R. T. for nearly twenty-five years. For twelve years he served as an assistant roadmaster. Four years ago he was promoted to roadmaster on the surface lines.

William M. Coleman, vice-president, secretary and general counsel of the Republic Railway & Light Company and secretary and general counsel of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, died suddenly on Jan. 21 in a hotel in Washington, D. C. Mr. Coleman was vice-president of the Central States Electric Corporation, New York City, and a director of the Peerless Motorcar Company.

Elmo Snider, foreman of air brake inspectors of the Brooklyn Rapid Transit Railroad, was one of the victims of a recent hotel fire in Hoboken where twelve people lost their lives. Mr. Snider had been in the employ of the Brooklyn Rapid Transit since October, 1903, when he entered the services of the company as air brake man at the 39th Street shop. During the next nine years he performed the duties of assistant foreman and foreman of air brakes at the Fresh Pond shops and at 36th Street shop. Prior to entering the employ of the Brooklyn Rapid Transit Mr. Snider spent several years with the New York Aid Brake Company overhauling and manufacturing air brake appliances in the company's factory.

William B. Strang, president of the Missouri & Kansas Interurban Railway, Kansas City, Kans., died at Excelsior Springs, Kan., on Jan. 13. Mr. Strang began his career as a railroad builder when he was fifteen years old. With his father he built sections of the Chicago, Burlington & Quincy, Baltimore & Ohio, Missouri Pacific and the Santa Fe Railroads from Santa Fe, N. M., to the Kansas line. In the construction of the Santa Fe line he superintended the building of the roadbed through the mountains, a hazardous task. He also built part of the Kansas City Southern and the Kansas City, Fort Scott & Memphis systems. In 1900 Mr. Strang began the construction of the Detroit, Toledo & Shore Line Railroad between Toledo and Detroit. In 1905 work was begun on the Missouri & Kansas Interurban Railway from Kansas City to Olathe. One of the first self-propelled cars in the world was perfected by Mr. Strang and operated on the Missouri & Kansas line.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Crossarm Prices Lower

Buying Uneven in Several Sections of Country, but Stocks in Jobbers' Yards Satisfactory

Conditions in cross-arm buying seem to be rather uneven. Price reductions of about 15 per cent, effective Feb. 1, are reported from the East and Middle West, but no reduction from the South to date. Buying in the New York district is on a pretty fair basis, several satisfactory orders recently having been placed. Mid-West demand is only fair, while from the Atlanta territory the movement is quite slow. Stocks in jobbers' yards are reported good in all sections.

New prices for fir arms, two-pin, 3¼ in. x 4¼ in. x 3 ft., are quoted in New York at $61.13 per 100 in less than 1,000-lineal-ft. lots, and $54.34 in 1,000-ft. to 3,000-ft. lots. These in Chicago are $56.70 and $50.40. The N. E. L. A. fir arm, four-pin, 3½ in. x 4½ in. x 5 ft. 7 in., is quoted in New York at $138.26 and $122.91 and in Chicago $128.25 and $114, same quantities. The four-pin, 3¼-in. x 4¼-in. x 5-ft. arm is $90.56 in New York and $84 in Chicago, 1,000-ft. to 3,000-ft. lots.

From Atlanta, in lots of 1,000 lineal feet and over, two-pin, 4-ft. fir arms are quoted at $62; four-pin, 5-ft. arms at $104; N. E. L. A. arms, two-pin, 3-ft., at $106, and four-pin, 5-ft., at $157.

Quiet Market for Stranded Steel Wire

Railways Not Even Buying for Necessary Repair—Hope of Lower Prices a Factor

Buying of stranded steel wire by electric railways is now and has been for the past couple of months of the very lightest character. Not even the minimum amount necessary to make current repairs to suspension wire, guy wire, etc., is being purchased, some manufacturers state, and it is certain that traction companies are making no effort to stock ahead. The quiet market for steel wire seems to be caused by a combination of circumstances, among which are a general depression of industry, money tightness and hope of possible lower prices.

Shipments of common sizes can be made by some manufacturers from stock, but one of the largest makers, at least, has no surplus stock as yet and is quoting thirty to sixty days on new orders. This rather surprising condition is caused by the large number of back orders which piled up and which even until well into the fourth quarter of 1920 were far ahead of mill capacity. As few if any new orders are coming in and as production in this instance is on a full time basis it is thought that stocks of the finished product should appear by about the first of March.

The price situation, it seems, is a bit complicated. Railways appear to expect lower prices. Some manufacturers assert this hope is not justified under present labor and material costs. Producers are just beginning to reap the benefit of lower raw material cost.

Wages, too, have been reduced in only some departments. Nevertheless, in view of the continuing trend in those directions it appears logical to believe that the ultimate price tendency is downward. In fact one of the important producers has already led the way with a slight reduction in stranded steel wire since the first of the year.

Manufacturers in this line are generally optimistic regarding the swing of business to better buying, though when the turn will come appears uncertain. Railways have not covered their needs as to steel wire for necessary repairs, let alone for extensions that may be made in the spring; stocks do not apparently exist in the hands of any consumer and consequently the potential market should undoubtedly be large.

Are Electric Railways Unfair in Awaiting Price Declines?

Equipment Manufacturers Feel that They Have a Grievance Against Traction Companies for Their Policy of Curtailing Buying to Await Lower Prices

Some of the large manufacturers of electric railway equipment feel that they have a just grievance against the traction companies in respect to the latter's curtailment of buying in the hope that lower prices of material may prevail. It is quite generally admitted that buying in this field is lighter right now than even the depression of business and tightness of money can account for. The answer is that purchasing departments are awaiting lower prices, although their equipment needs are piling up. This leads to moot questions, such as whether prices in certain lines can come down at this time, and just at what point prices are low enough to justify buying.

Manufacturers do not deny that the curtailing of buying on a declining market is sound business sense, as they themselves have followed the same policy in purchasing raw material. Their grievance is that railway purchasing departments in expecting lower prices often do not take into consideration all the factors. These on the manufacturers' side include high money rates, fixed taxes, wage contracts which often prevent lower labor costs, stocks of material bought at high prices to cover future needs, the amount of raw material reductions and the fact that less demand and lower production entail greater overhead expense.

It is a self-evident fact that the sooner prices in the electric railway field or any other line reach a rock-bottom basis, fairly arrived at under existing labor, material, transportation and other costs, the sooner a return to normal business will be reached. Equipment manufacturers in many cases have recognized this fact by passing lowered costs squarely on to the consumer. But, according to the vice-president of a large manufacturing concern supplying traction companies with a staple article, "give the purchasing agent an inch and he'll want an ell." In other words, where prices have been reduced, buyers sometimes expect a decrease that would be greater than all the previous increases while prices were rising.

It is well to remember at this time that where an article has increased in price 100 per cent, it then requires but a 50 per cent drop to reach the former price. The executive of the above-mentioned company voices this plant by a concrete example. For purposes of illustration the cost of the company's product before the war is placed at $40 and the profit received is represented by x. In 1920 the cost had mounted to $80, but the profit per unit remained at x. If the margin of profit had been increased proportionately with costs, the gain per unit should now stand at 2x. Yet electric railways, he states, complain because in view of lowered costs, the margin of profit is not now cut to less than x.

It seems that here is a basis for misunderstanding at least, if nothing else. Manufacturers and purchasing departments can profitably clear this up, on the one hand by a frank statement as to the reasons why prices may or may not come down and on the other by a willingness to meet manufacturers half way in the one matter of price reductions.

Market for Trolley Wire Remains Quiet

Firmer Tone to Copper Would Precipitate Buying of Raw and Finished Product, It Is Thought

The market for bare copper as well as composition trolley wire is comparatively quiet. Until a firm tone develops to the copper market this condition is likely to maintain. Some wire manufacturers, recognizing the unusual opportunity presented to buy copper at its present low price of 12.75 cents spot, are stocking to cover their future needs. Others report they have not the money to buy and are unable to carry the interest charges on a tied-up investment such as a large stock of copper would represent.

When the price of copper eventually starts to move upward, however, it is probable that all consumers by some means or other will attempt to cover their copper needs as far ahead as possible. This would in turn undoubtedly have a salutary effect upon buyers of trolley wire, who would naturally desire to get in on the ground floor too.

This may account for the slight improvement in buying that is noted by a couple of producers since the first of the year. By far the great majority of utilities, however, are not financially able to stock ahead on any material that they use. Hence the greater part of the present light demand is accounted for by actual repair needs.

Prices of trolley wire have followed a gradually descending curve from their peak, commensurate with the reductions that have come about in raw material, and in some cases labor costs. Price reductions have been made as recently as within the last two weeks, and quotations are very generally shaded for advantageous orders. The current bare base price averages about 15 to 16 cents per pound although several producers refuse to quote a base price under present unsettled market conditions.

Deliveries are entirely favorable, for although no stocks of the finished product are carried in this field, except by some makers of more or less special wire, mills now are able to speed up if necessary. In general, orders can be filled in two to three weeks. The outlook for good buying during the present year, despite the present slow market, is held to be favorable by manufacturers, though the present slackness, it is stated, may continue for some little time.

Carbon Brush Demand Is Mostly for Maintenance

Increasing Tendency Noted for Traction Interests to Order Brushes in Small Amounts and for Quick Delivery

While the market for carbon brushes for strictly maintenance work is holding up about on a normal plane, buying for new motors and generators has fallen off. The curtailment of production in the automobile manufacturing field has reacted on the brush producer, since a large volume of brush business is done for the automobile trade. This, of course, releases production capacity for the making of brushes for the strictly electrical market, so that shipment is short.

Motor production in itself has suffered a recession, both in fractional sizes and in integral sizes for industrial work. There have been somewhat fewer brushes needed, for maintenance also of the industrial sizes because of curtailed operation in the mills of many of the larger industries of the country.

These factors help shipments, one and two weeks being the average length of time quoted for the filling of orders, while other quotations will take up to six weeks. Where it is necessary to fill a rush order, a small quantity of brushes can be put out in two days. Brushes for safety cars can be gotten out in up to three weeks' time while for the larger types of cars from four to six weeks is quoted. It is of interest to note the large number of orders manufacturers are getting for single sets of brushes for one car motor and compare this method of buying to that normally in vogue.

And this comes right down to what seems to be more and more of a tendency today. Too many of these rush orders for overnight shipment are coming in to the manufacturers. The practice seems to be developing into one of waiting until the last minute and then ordering only a minimum number of pieces. Traction companies are particularly in the limelight in this connection, and they are the consumers which heretofore have been noted for keeping good stocks of brushes—at least to cover all emergencies. Of course, the financial condition of most roads is such as to require the limiting of future buying, but it would seem that purchases could be kept out of the rush class for this type of maintenance material, which is bound to wear out. The reaction comes, of course, on the producing abilities of the manufacturer.

Although stocks of foreign brushes are kept in this country, there is little stocking done by domestic manufacturers because of the great number of sizes, qualities and duties required by motor and generator manufacturers.

NEW YORK METAL MARKET PRICES

	Jan. 5, 1921	Feb. 3, 1921
Copper ingots, cents per lb	12.75 to 13.00	12.75
Copper wire base, cents per lb	16.25	15.75
Lead, cents per lb	4.75	4.75
Nickel, cents per lb	43.00	43.00
Zinc, cents per lb	6.00	5.50
Tin, cents per lb	36.75	32.25
Aluminum, 98 to 99 per cent, cents per lb	28.30	28.00

OLD METAL PRICES—NEW YORK

	Jan. 5, 1921	Feb 3, 1921
Heavy copper, cents per lb	10.00 to 10.50	11.00 to 11.25
Light copper, cents per lb	8.00 to 8.25	8.50 to 8.75
Heavy brass, cents per lb	6.00 to 6.50	6.00 to 6.50
Zinc, old scrap, cents per lb	3.00 to 3.25	3.00 to 3.25
Yellow brass, cents per lb	4.00 to 4.50	4.00 to 4.50
Lead, heavy, cents per lb	3.50 to 3.75	4.00 to 4.25
Steel car axles, Chicago, per net ton	17.00 to 18.00	16.50 to 17.00
Old car wheels, Chicago, per gross ton	21.00 to 22.00	21.00 to 22.00
Steel rails (short) Chicago, per gross ton	16.50 to 17.00	16.00 to 17.00
Steel rails (rerolling), Chicago, gross ton	17.00 to 18.00	16.00 to 17.00
Machine shop turnings, Chicago, net ton	6.00 to 6.50	7.00 to 7.50

ELECTRIC RAILWAY MATERIAL PRICES

	Jan. 5, 1921	Feb. 3, 1921
Rubber-covered wire base, New York, cents per lb	18.00	18.00
Weatherproof wire base, New York, cents per lb	19.00 to 20.00	18.00
Standard Bessemer Steel Rails, per gross ton	45.00 to 51.00	45.00
Standard open hearth rails, per gross ton	47.00 to 53.00	47.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	73.00	.....
Rails, girder (grooved), per gross ton, f.o.b. mill	88.00	.....
Wire nails, Pittsburgh, cents per lb	3.25	3.25
Railroad spikes, drive, Pittsburgh base, cents per lb	3.65 to 4.00	3.65 to 4.00
Tie plates (flat type), cents per lb	2.75	2.75
Tie plates (brace type), cents per lb	2.75	2.75
Tie rods, Pittsburgh base, cents per lb	6.00	6.00
Fish plates, cents per lb	2.75	2.75
Angle bars, cents per lb	2.75	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb	5.50	5.50
Steel bars, Pittsburgh, cents per lb	2.35	2.35
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.20	4.20
Sheet iron, galvanised (24 gage), Pittsburgh, cents per lb	5.25	5.25
Galvanised barbed wire, Pittsburgh, cents per lb	4.10	4.10

	Jan. 5, 1921	Feb. 3, 1921
Galvanised wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes, A quality), New York, discount	79%	79%
Waste, wool white (according to grade), cents per lb	13 to 19	11 to 17
Waste cotton (100 lb. bale), cents per lb	11 to 15	11 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	40.00	40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	36.00	36.00
Asphalt, filler, per ton	36.00	36.00
Cement, New York, per bbl	4.50	4.10
Linseed oil (raw, 5 bbl. lots), New York, per gal	.83	.77
Linseed oil (boiled, 5 bbl. lots), New York, per gal	.85	.79
White lead (100 lb. keg), New York, cents per lb	.14	.13
Turpentine (bbl. lots), New York, per gal.	.75	.70

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* These prices are f.o.b. works, with boxing charges extra.

Rolling Stock

The Chicago Surface Lines, after receiving bids on fifty new motor cars of the specifications published in ELECTRIC RAILWAY JOURNAL for Dec. 18, on page 1271, has decided not to purchase them. Instead, bids have been asked on fifty trailers in addition to the fifty now being built in the company's West Side shop. The specifications for these new cars were incorporated into a sample car which was fully described on page 110 of the July 17, 1920, issue. The fifty motor cars were intended for hauling the trailers now being built in all-day train service. It is planned to use the present Pullman-type motor cars for hauling trailers in rush hour service only. Bids on the fifty trailers will be opened Feb. 8, a very short time having been allowed for considering the specifications.

The Los Angeles (Cal.) Railway, in its program for this year has included the lengthening of eighty-nine cars, giving larger loading platforms. Their length will be increased from 34 ft. 1½ in. to 44 ft. 7 in. This alteration will allow for one extra "walk-over" seat at each end of the car. Another thirty-four cars of the interurban type are to be equipped with folding doors on the ends in place of the drop bars and curtains that have been in use. Work on the 123 cars will be distributed through the greater part of 1921 as only a few of the cars can be placed in the shops at a time, owing to the heavy demands of travel.

The London & Port Stanley Railway, a municipally owned line running from London, Ontario, Canada, to Lake Erie, will add an 80-ton electric locomotive and several passenger cars to its equipment this year.

Track and Roadway

Frontier Electric Railway, Buffalo, New York.—The Aldermen of North Tonawanda, N. Y., have approved the application of the Frontier Electric Railway for an extension of time for beginning and completing its proposed freight line between Buffalo and Niagara Falls. Under the new requirements the line must be started on or before Dec. 31, 1923, and finished by Aug. 1, 1927. Inability to finance the line at this time is the reason given by officials for not undertaking the work just now. The Pennsylvania and Lackawanna Railroads are interested in the project as they will use the line for the transportation of freight between Buffalo and Niagara Falls.

El Paso (Tex.) Electric Railway.—The El Paso Electric Railway has many improvements under consideration for 1921. The plan will cover the installation of a new turbine in the power station, the purchase of additional safety cars, additional double track and turn-outs on the street railway system, additional equipment in both power station and carhouse; also additional transformers, meters and customers' services.

Houston (Tex.) Electric Company.—The Houston Electric Company is planning the following construction program for 1921: Rebuilding eight pit tracks and three repair tracks at Milby Street carhouse, rebuilding two additional storage tracks each 400 ft. long at the Milby Street carhouse, double tracking Harrisburg Road and Lorraine Street, a distance of approximately 3,400 ft. in paved construction, using 103-lb. rail, thermit joints, cypress ties, concrete foundation and brick pavement; rebuilding ballasted track on Palmer and Engelke Streets, approximately 3,000 ft., using 70-lb. A.S.C.E. rail; double tracking Fairview Avenue and Taft Avenue approximately 1,200 ft. ballasted construction, using 70-lb. A.S.C.E. rail; installing 300 ft. siding on Lorraine Street in paved construction; extending siding No. 3 on Clark Street 800 ft. long, ballasted construction, using 70-lb. rail; extending No. 2 siding on Fairview Avenue 400 ft. long, ballasted construction, using 70-lb. A.S.C.E. rail; lowering track on Washington Avenue to new city grade approximately 3,000 ft. and installing Nos. 1 and 2 sidings in paved construction, using 103-lb. rail, brick pavement and concrete substructure; double tracking Fannin Street from Franklin to Texas in paved construction with necessary special work, using 122-lb. rail, thermit joints, brick pavement and concrete substructure.

Power Houses, Shops and Buildings

Jamestown (N. Y.) Street Railway.—The Jamestown Street Railway has filed plans for the immediate construction of a modern two-story office building on the site of the building recently destroyed by fire in West Third Street.

Texas Electric Railway, Dallas, Tex.—The passenger station of the Texas Electric Railway at Sherman, Tex., was damaged recently by fire to the extent of about $1,500. The fire started in a storage room from cause undetermined. The loss was covered by insurance.

Trade Notes

The Inland Wire & Cable Company, Cleveland, is planning to erect a new plant, 100 ft. x 350 ft., one-story, at Hammond, Ind., to cost about $100,000.

The Arthur Power-saving Recorder Company, New Haven, Conn., has received an order for 700 recorders from the Rhode Island Company, Providence, R. I.

Leon Chapuis, 36 Boulevard de Magenta, Paris, France, distributor of traction material, advises the receipt of a large order for electric railway supplies for use in the devastated regions of France.

The Edward Valve & Manufacturing Company, 72 West Adams Street, Chicago, is planning to rebuild its plant at East Chicago, Ind., recently destroyed by fire. The loss is estimated at about $350,000.

C. H. Wheeler Manufacturing Company, Philadelphia, Pa., maker of condensers, pumps, feed water heaters, etc., announces the opening of a branch sales office in the Leader-News Building, Cleveland, Ohio. W. K. Eicher is in charge.

E. D. Kellogg has been appointed New Jersey representative for the Conveyors Corporation of America, manufacturer of machinery for handling coal, sand, gravel, ashes, etc. He will make his headquarters at the company's Eastern office, 110 West Tenth Street, N. Y.

The Maring Wire Company, Muskegon, Mich., manufacturer of enameled and cotton-covered magnet wire, announces the appointment of the R. W. Lillie Corporation, 30 Church Street, New York City as its Eastern representative. The Boston office at 176 Federal Street is in charge of H. D. Steele.

The Champion Engineering Company, Kenton, Ohio, manufacturer of electric traveling cranes, has appointed A. E. Hogrebe, mechanical and electrical engineer, sales engineer for the Baltimore territory. Mr. Hogerbe has been identified with the electric traveling crane business since 1891, having been connected with the Yale & Towne Manufacturing Company, Brown Hoisting Machinery Company, Niles-Bement-Pond Company and Pawling & Harnischfeger.

The MacGillis & Gibbs Company, Milwaukee, manufacturer of cedar posts, poles and railway cross-ties, which has completed its twenty-second year in business, is distributing a booklet entitled "Poles of Cedar," in which it gives an outline of its activities and short sketch of its officers. J. E. Gerich, president and general manager, was one of the incorporators of the company and was made president and general manager in 1905.

The Roller-Smith Company, 223 Broadway, New York City, announces the appointment of the J. E. Dilworth Company, 493 South Main Street, Memphis, Tenn., as its representative in the western half of Tennessee, the eastern half of Arkansas and the northern half of Mississippi. The electrical department of the Dilworth company is in charge of E. M. Greeson, who was formerly associated with Fairbanks, Morse & Company and the Sanborn Electric Company, both of Indianapolis.

New Advertising Literature

Insulating Material.—Mica Insulator Company, 68 Church St., New York City, has just issued a new catalog, No. 85, covering the company's line of electrical insulating materials.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. B. ANDERSON, Assistant News Editor

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Public Function of Railway Emphasized at Conference

THE midyear meeting of 1921 has passed into history. The wisdom of the selection of Chicago as the convention city was shown by the large attendance, although it is probable that there would have been a great many delegates present even at a city less accessible because of the great interest felt in the topics which made up the program. The conference reflected a feeling of confidence that each succeeding month will bring the condition of the electric railways nearer to that sound basis which is necessary for the good of the communities served. Obviously the discussion of the reports of the federal commission and the Chamber of Commerce committee in the afternoon emphasized the public nature of railway operation and the need on the part of the public for a clearer perception of its status. The public must understand that the business differs radically in its nature and in its possible profits from that of an industrial or mercantile enterprise. It is performing a public duty though under private management. This conception of the railway and its function is now generally accepted within the industry, but only faintly understood outside except where it has been particularly emphasized by some such action as that wherein the state has assumed responsibility for continued operation or where service-at-cost franchises are in force. But it is true, no matter what the franchises may be, and the principal work before the industry at present is to spread this thought and then to bring about a condition by virtue of which the capital necessary to furnish the required facilities will be provided.

How Can the Railways Solve the Financing Problem?

ALL WHO could attend the Chicago conference, and all who have had an opportunity to read the papers presented there, must admire the frank and clear presentation of the subjects by the various speakers. At this writing, which is early in the week and before the conference, no reflection of the association's discussion or action can be made. But, thanks to the commendable policy of printing and distributing the formal addresses long enough beforehand to encourage discussion at the conference, these addresses are available for comment now.

It seems somewhat trite to repeat the statement that the industry's financing is in a serious condition, and that a discussion of "Electric Railway Financing" is timely for the industry even though not new. But it is pertinent to point out that the inter-relation of the problems of financing and of the furnishing of adequate transportation to the public—the only real reason for the existence of the electric railway—is so strong and so close that a complete setting forth of the situation as at Chicago is well worth while.

The addresses presented, showing as they do both past and present phases of financing, form a composite picture which should be considered as a whole to see the effect one element has on each other. The turn of the railway business from a private construction and pioneering, and actually risky, business into a recognized essential service has changed the situation. The risk is not yet gone, but the speculative feature has been largely eliminated. Necessary as early day financing methods may have been in order to develop the electric railway, the present day problem is the one to be met.

The subject as presented divides into two general classes—the marketing of senior securities and the marketing of junior securities. Both problems are serious in that, as both Mr. Shrader and Mr. Corey point out, the industry as a whole is topheavy with senior securities. Mr. Corey says a 35 per cent to 40 per cent interest payment is conservative, 75 per cent impossible. The senior security market demands that the debt be a smaller part of the total capitalization. New money won't come in through junior securities to create new capital merely to improve the bond market. The depreciated physical property must be maintained—be brought back to a satisfactory condition—in order to build up the security for the bonds, even. To do this, as is well known, more net revenue must be obtained. Better service with present equipment, merchandising, more transportation, increased operating economies, all these will help. A fare which is really reasonable must be maintained and the public must further do its part to assist in making the service really economical through elimination of irrelevant costs.

But there are some things which the railways can do in the financing program. The speakers call the present financial structure a patchwork and say it must sooner or later be recast. It seems pertinent to inquire, "If eventually, why not now?" An understandable financial scheme is conducive to success in home-town financing. As Mr. Way well says, this is a new kind of business as conducted today, a thing for the railways themselves to undertake. He also says that this can, however, only help, not solve. From the standpoint of supplying all the money for junior financing, this may be true, but successful home-town financing has a far greater effect than the immediate supplying of money. The community's continued interest, practically assured by its purchase of securities in any considerable quantity, is a strong producer of confidence in the man at a distance who is solicited for the purchase of similar securities.

Finally, direct municipal aid is suggested. This seems to be too impersonal. The difference between that and municipal ownership is not great and, except in proportion to the actual benefits received by the city as a whole, is difficult to substantiate. Mr. Traylor's suggestion is practically a modified service-at-cost arrangement with sliding scales for rates, employees and capital. This is a form of franchise, but yet does not solve the financing. It is an aid in the sale of capital shares, which is the problem of the industry today.

Fares and Other Factors in Traffic Growth

IN THESE days of changing business conditions, changing fares and changes in traffic, there is danger that incorrect deductions will be drawn of the reason for variations in the number of passengers carried. As we have said before, a change in fare is many times an important factor in determining the amount of business done by an electric railway, but it is not the only factor and in many cases it is not the most important factor. For this reason the experience in one city with a change of fare is not an unerring guide to the results which may be expected from the same increase in another city.

One company in a small city which was anxious to know exactly what the effect on its traffic would be from different fares received the following advice from a consulting engineer:

"Run one typical day absolutely free, merely registering the traffic for the sake of the passenger count. Charge a fare of 1 cent the second day, 2 cents the third day, 2½ or 3 cents the fourth day, 4 cents the fifth day, and so on until you have reached a prohibitive maximum. By that means you will learn how many people really can make use of your facilities under known weather and industrial conditions, and you will have a firm foundation for trials of cash fares, ticket fares, off-peak fares, unlimited ride tickets, etc."

We are sorry the client did not have the courage to try this step, although we acknowledge such rapid changes in fare would have been rather demoralizing for the public and a not very satisfactory means of determining the critical fare, as the public are not automatons. Undoubtedly the free day would have developed a large number of short distance riders, just as the ordinary person will use an elevator to descend two or three flights of stairs when it is just about as easy and quick to walk. But this does not mean that such a rider is a possible patron if any charge is made for a ride. This is one reason why the plan of free railways, as recommended by Mr. Bauer of Lynn is not practicable. The cars would be so crowded by those who did not need to ride as to keep off those to whom transportation is a necessity. This difficulty actually arose at Glasgow, where the halfpenny riders crowded off those who really needed the service.

Now let us consider the second point made, *i.e.*, that the fare is by no means the only factor in causing traffic changes. The truth of this proposition is just as important as that first mentioned, but is probably not so generally understood. Nevertheless, there are many examples of cities where increased service and short headway by one-man cars or some other means has greatly increased the traffic, even in spite of an increased fare. Terre Haute is a good and well-known example. Another is shown by the way in which patronage seems immediately to come to every new rapid transit line developed in New York. The greater part of this traffic is not diverted, to all appearances, from parallel lines, but represents the readjustment of transportation conditions throughout the metropolitan district; that is to say, residents flow into the territory served because transportation is available.

A factor in traffic growth too much neglected in the past is the way in which transportation is merchandised. If the public can be made to realize that transportation is a money saver to them or in other ways is advantageous, and particularly if the "riding habit" can be developed, there will be an increase in the riding from that cause alone, independent of any reduction in fare. This has really been the main thought back of the sale of unlimited ride tickets where they have been installed. The price set has been based usually upon a daily use of the ticket at least three times; that is to say, a passenger who rode only three times a day would not save money, but every ride beyond that number would be practically without charge. The company therefore gained partly by stimulating rides (usually in the off-peak hours) which the holder would otherwise not have taken and partly by encouraging him and others in the riding habit.

The Canadian Association Emerges from Its Seclusion

THE Canadian Electric Railway Association has previously been a somewhat close corporation, as it had a perfect right to be. At the recent Ottawa convention, however, a new policy was inaugurated. Supply men and other erstwhile outsiders were invited to attend the convention, to take part in its proceedings and to join the association through the companies with which they are affiliated. The result was very satisfactory and, to judge from the comments of men who had attended many meetings, the Ottawa "guests," as all newcomers were designated, formed a distinct addition to the convention. The electric railway industry in Canada will benefit by the inauguration of the new policy and the railway companies in the United States will follow with greater interest than ever the proceedings of the meetings of their brethren across the international boundary.

The Ottawa meeting was unique in more than one particular, but an outstanding feature was the fine spirit which existed, and was manifested, between the representatives of the public and the managers of the privately owned and privately operated electric railways. Canada is, of course, the home of more municipal electric railways than the United States, measured numerically, and relatively they are still more in evidence. When Toronto takes over its railway system, which will presumably be next fall, the municipally operated mileage in the Dominion will be considerable. Hence it is highly important for the Canadian Association to keep in close touch with this phase of the industry's development. The election of H. H. Couzens, of the Toronto Transportation Commission, to the executive committee shows that this fact is appreciated.

The discussion at Ottawa demonstrated very clearly the gain that is possible through close co-operation between the public, through its representatives, and the companies. Take, for example, the matter of traffic regulation, a topic which attracted several police chiefs to the convention. While the paper on this subject actually was not discussed, the guardians of the peace and of the public safety could not but get somewhat of the electric railway aspect of the problems which confront them jointly. Another example was service at cost. Montreal is getting good tramway service at cost from a privately owned and operated property; Toronto is to get the same thing from one publicly owned and operated. Attendants at the meeting who heard Mr. Couzens, Col. J. E. Hutcheson of the Montreal Tramways, Dr. L. A. Herdt of the Montreal Tramways Commission and others discuss this subject from all points of view could readily see that, granted the service-at-cost principle, it matters little who sits in the front office provided politics is eliminated and first-class operating talent is employed. It is particularly urgent in Canada that the essential unity of the industry be recognized so that the development of antagonistic camps be not permitted. The association will be a powerful factor to this end.

Engineering Opinion Should Be Free from Prejudice

AT A RECENT meeting of an important committee of the Engineering Association the effect on technical progress of one-sided views held by some engineers was brought out forcibly. The point was that men are apt to think highly or otherwise of a thing or a practice because with them it may respectively have succeeded or failed. Such short-sighted reasoning, or lack of it, is contrary to the standards of engineering thought. It often happens that some particular device or a given procedure is adopted practically by accident. A good salesman drops in and puts up a convincing argument in favor of something that he is pushing; or urgent necessity compels the trying out of some new "stunt" to accomplish a desired end. This is all right as far as it goes, but it does not go far enough. The real engineer realizes the importance of an all-round knowledge of every proposition for which he is responsible.

It is just here that the committee work of the Engineering Association is most effective. Generally speaking, its standards, recommended practices, and specifications are prepared in the light of rather full knowledge. It is the part of wisdom for the members to be familiar with and to apply the results of this constructive work.

Farmers Indorse Electric Freight Transportation

TRANSPORTATION service is the only commodity which the ordinary railway has for sale. For any commodity to be salable it must be right in kind, quality and cost. Some electric railways now offer several kinds of transportation service for sale, but the industry as a whole has pinned its hopes too exclusively on the service of transporting passengers.

That people do want other kinds of transportation service and are willing to fight tooth and nail to obtain it was evidenced last summer by the activities of the Indiana Federation of Farmers' Associations in securing the special legislation necessary in order that the interurban railways of the State might haul live stock over tracks on city streets. These activities resulted from the appreciation of the farmers of the quality of the live-stock transportation service that the electric railways could offer. One of the large sources of loss to the live-stock shipper is the reduction in weight which animals undergo when in transit for any extended period. When one of the interurban railways of the State showed that it could load a car of live stock and deliver it at a depot stockyard nearly 50 miles away in about two hours and a half and, further, that arrangements for such a shipment could be put through in twenty-four hours or less the farmers of the State began to be interested. On the steam roads the corresponding transit time was from one to two days and it usually took a week to make arrangements and secure the necessary car space. The electric service was also much superior to motor truck service both in speed and cost.

When it was found that the service could not be extended to other lines because of statute limitations the farmers' organizations proceeded to have the limitations removed, even going to the extent of forcing attention to the matter at a special meeting of the Legislature, which had been called together to consider other matters. The farmers fought for something which was of value to them, but their action benefited the railways also.

Practically every community has undeveloped transportation service possibilities within its midst. It is up to the electric railway, as the biggest local transportation service merchant, to develop and sell this service. But in the development and sale of the service mutual benefit must arise. By and large the public will co-operate with any honest and useful industry, but it will not do all of the co-operating.

One Indisputable Field for the Bus

FUR and feathers will fly thick and fast during the coming year or two between the advocates of rail and rail-less transportation, particularly as the automotive interests have discovered that the public utility field is one well worth going after even if its demands are not going to be measured in millions of units. We hope and expect that the discussions will be within the bounds of good sense and good taste, for, as the somewhat late Sir Roger de Coverley so sagely remarked, "There is much to be said on both sides."

There surely is room for legitimate differences of opinion where the cold figures alone do not tell all the story. We may prove to a certainty that an electric railway need charge only a 7-cent fare for a certain service, when along comes an experienced bus operator who charges 10 cents, but gets the business because he has introduced the new element of superior speed. So, too, at the top of the traffic scale, we might figure that half a dozen parallel bus lines as regards initial investment would be cheaper than an equivalent capacity of underground or elevated railways, but we cannot doubt that the unhampered track transportation would be most satisfying to the public because of the same element, namely, speed.

An example of the indisputable superiority of one kind of transport over the other at the bottom of the traffic scale is afforded by the small bus lines that reach out over trackless highways from some market town to the villages and farms within, say, two hours' ride. In the old days some promoter would have seized upon such situations to build an electric railway that could not possibly pay. Today one, two or three buses a day suffice for a beginning, and no great harm is done if the district does not make good, because the bus simply heads for new fields to conquer. The local electric railway does not suffer a bit. On the contrary, the buses bring new buyers into the town. In one city of 40,000 seven lines operated by as many owners bring 150 to 300 people into town every day for business or pleasure—the latter aspect being proved by the enlarged traffic on Saturday nights, when the "hired man" and his best girl want to see another installment of the "Lucubrations of Lulu" or some other movie epic. In this particular city the buses used to make a nuisance of themselves by using the downtown public highway as garages. When the City Council ordered them off, the Chamber of Commerce went to the trouble of renting a waiting room and terminal space in the firm determination that they would keep their visitors from the mail order house and the stereoscope. Today this building is self-supporting.

As already noted, such a bus service is a benefit and not an injury to the local electric railway. The only question that arises is whether the railway itself ought not to develop and co-ordinate services of this kind. It will be observed that while there are seven different routes, each is so small that it is really a personally conducted affair of but one to three machines apiece. Perhaps, if all the buses were of one type and handled from one garage, fares could be a bit lower, service more reliable and better provision made for fluctuations in traffic. From a study of the results of small motor bus operation elsewhere, however, it seems probable that the time for company operation becomes ripe when the driving is done by an employee instead of by the owner himself or by some member of his family. In any event, there are already hundreds if not thousands of such services in the United States, and their development is worth watching by the more experienced railway man, who realizes that the only logical trend is toward the operation of all mass or popular transport under one direction.

Car Cards Should Be Used for Merchandising Transportation

THAT the advertising racks in the street cars are one of the best existing mediums of advertising has long been recognized by national advertisers. Local merchants in the territory served are also fast becoming acquainted with the value of this medium. Why, then, do so many railways sell all this space and then spend large amounts for display advertising in other mediums that do not have anywhere near the circulation that can be reached daily by its own cars?

Space in newspapers lasts only for the day of issue, and it is impossible to reach every one thoroughly by a single display advertisement. Many people who read the daily papers also fail to read the advertisements, no matter how much time has been spent in setting them up in an attractive manner. As a general rule, however, while on the cars passengers have nothing to keep their minds thoroughly engaged, and it is but natural that the car ads attract their attention. Moreover, they are reached during the period when they are using transportation and hence when their minds are open to constructive suggestions or transportation policies and improvements.

Of late some companies have begun to realize what a successful advertising medium they actually have in the cars and have stuck posters on the windows, hung fliers to the strap rail, or tacked cards in the bulkheads when wishing to tell their patrons about a change in service, rerouting, or fare schedules. But permanent racks are better, as temporary notices often mar the car finish and always last a short time only and cause a litter of paper.

Companies are not urged to abandon newspaper advertising entirely but to consider the merits for their particular kind of notices of car cards and then, when advertising contracts are being renewed, to be in a position to say whether or not space shall be reserved in the advertising racks for the sole use of the company.

Quotation from the Federal Electric Railways Commission Report

No. 7

RESTORATION of credit involves a readjustment of relations which will remove public antagonism, provide public co-operation and insure to the investor the integrity of his investment and a fair rate of return thereon.

Effective public co-operation should be exercised by eliminating, in so far as it is practicable, special assessments for sprinkling, paving and for the construction and maintenance of bridges which are used by the public for highway purposes.

Keeping up the "Per Cent Condition" of the Pole Line

A POLE line, like everything else, is new but once; to borrow an expression from the vocabulary of the appraisal engineer, it has "100 per cent condition" only once in its life. If it receives no replacements or reinforcements and is fortunate enough to keep out of the way of stray cyclones its per cent condition decreases year by year, slowly at first and with increasing rapidity until it reaches the low level of 40 or 50 per cent, at about which time it can no longer be operated safely. By a proper system of replacement or reinforcements, however, the per cent condition can be maintained indefinitely at some safe operating figure, say between 70 and 90 per cent. Today, proper maintenance furnishes one of the big problems of the pole-using public utilities.

By far the greater number of wooden pole lines in this country have been built within the past twenty years and many of them have reached the age where the per cent condition is beginning to decrease rapidly. Most of the poles in these lines have been set without preservative treatment to ward off that chief enemy of the wooden pole, decay. Where decay has not progressed too far the life of the pole can be prolonged by digging away the earth near the ground line, removing the diseased wood, drying the healthy wood and administering a couple of coats of preservative with a brush. Concrete reinforcement is in considerable favor and concrete butts to which the pole is clamped above ground line have been used also. Some companies follow a definite scheme of replacement, replacing, say, every eighth or tenth pole each year, but making no attempt to prolong the life of the poles except by using preservatives on the new pole used for replacement.

The distribution man is often in a quandary as to just which is the best method to follow. As a matter of fact, no one method is best for all conditions of service, soil and climate. All of the methods of prolonging the life of a pole after it has been set are more or less expensive. Brush treatment of such a pole costs from $4 to $10. There is no question but that proper brush treatment does prolong the life of the pole. Likewise, while it is extremely doubtful if the concrete jackets prevent decay there is no doubt but that they strengthen the pole where it has been weakened and therefore prolong its useful life. The all-important question is, do they prolong pole life enough to be worth while? The answer again depends on local conditions. With anchor poles, poles carrying a heavy load or other cases where the cost of a new pole is only a part, and sometimes a small part, of the total replacement charge the expenditure of a considerable sum of money for reinforcing can be justified. With small poles carrying light loads the economy of reinforcement methods may be problematical. In any event, the problem of pole maintenance is important now, when plans for next summer's maintenance work should be under way.

Symposium on Electric Railway Finance*

AUTHORS
JAMES F. FOGARTY S. B. WAY F. K. SHRADER
CHESTER COREY MELVIN A. TRAYLOR

James F. Fogarty

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Chester Corey

Melvin A. Traylor

The Subject Matter of the Chicago Conference Papers Shows How Railways Early Outgrew Local Stock Financing and Sought Loans to Build Extensions; How the Investors Demanded Protection Leading to the Present Requirements for Mortgage Bonds; How Financing by Share Capital Requires Good Margin Over Bond Interest, and How Municipal Aid Can Be Enlisted to Restore the Functioning of Local Transportation Systems to Prevent Community Strangulation

THE technical papers read at the morning session of the midyear conference of the American Electric Railway Association, held in Chicago on Feb. 10, related entirely to "electric railway financing." The program for the meeting had been arranged by the committee on subjects, of which James D. Mortimer is chairman, and an introductory statement was read by him.

Mr. Mortimer explained that this topic was selected because there appears to be none of greater importance to the industry at the moment. The inquiry conducted by the Federal Electric Railways Commission has tended to clear the atmosphere and make such a subject especially pertinent. This report should give satisfaction to every person, no matter what his viewpoint, with the possible exception of the public ownership advocate. The commission advises that capitalization when exceeding fair value should be reduced. The right of labor to "bargain collectively" was supported by the commission and the recognized principle of the right of capital to a reasonable and stable return was enunciated. Methods of attaining these ends were discussed by the commission and the way left open for each company and each community to solve their problems according to their respective abilities.

At present the experienced investor shudders when he is offered traction securities. They have almost ceased to be evidences of ownership and the volume of sales is negligible. Most of the trading is done by exchanging bonds or notes for a receipt issued by some reorganization committee.

These facts are as well known to the investing public and the investment bankers as they are to the people in the industry. We are looking for light on what the industry should do to reclaim itself and for that reason have asked those experienced in the manufacture and sale of electric railway securities to tell us what must be done to rehabilitate railway credit. With credit the companies can get money and with money they can improve and extend their properties and minimize walking and vehicular and other forms of competition. Without money the industry moves backward.

Mr. Mortimer then referred briefly to each paper scheduled. He pointed out that that by Mr. Fogarty is of the nature of history, but history often serves as a guide for future conduct, and many of the errors in early financing arose from inability to forecast the future. For this reason alone Mr. Fogarty's contribution should be valuable, even in the improbable event that the summary of historical practices should prove uninforming.

The task assigned to Mr. Shrader to define the present day requirements for mortgage securities to be readily salable is a difficult one with little or no market for traction securities at present. But Mr. Shrader has been able to give the factors of safety and requirements for stable earnings, and finds that these are really no more severe than those obtaining in respect to other public utility issues. As comparatively few railway companies could meet these requirements, however, it follows that few companies can finance capital improvements even if there were no investors' prejudice.

MUTUAL OWNERSHIP

In connection with Mr. Way's paper Mr. Mortimer pointed out that the investment field at home for utility securities is limitless in its ultimate possibilities, and the improvement in public relations in a few years that followed the sale of a substantial amount of safe securities in the communities served is marked. The direct sale of ideas is difficult. The indirect sale of ideas accompanying the direct sale of goods or securities is comparatively easy. The rules of the large investment houses in the sale of securities do not apply as a whole to this new field. The attitude of mind of the prospective investor does not correspond to that of the experienced client of the investment security house. The typical tabular statement of security characteristics, now standard in financial advertising, is not intelligible to this new class of investor. As a rule, long-time investments are not desired, and ability quickly to reconvert the investment into cash without loss is essential. Mr. Mortimer explained that the field is fertile, yet one where the greatest care must be exercised to avoid both actual and imaginary losses.

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*Abstracts of papers presented at the midyear conference of the American Electric Railway Association, held at the Drake Hotel, Chicago, on Feb. 10, 1921.

SHARE CAPITAL FINANCING

In connection with Mr. Corey's paper, Mr. Mortimer pointed out that Mr. Corey had developed a vital point in electric railway finance, in view of the fact that electric railways are largely owned now by their creditors. The new capital put into the industry during the last fifteen years, represented by shares of stock, is very small. The proportion of debt to the total investment has continued to increase, but the rate of increase has been less during the last eight or ten years than in the previous five or seven years. This decrease in the rate of increase of debt has been due in part to the inability to sell any kind of capital securities, and if the investing public will not purchase the interest bearing securities of the industry how can investors be expected to purchase junior securities, such as preferred shares and common shares? If a part of the new capital must be provided by the sale of capital shares, Mr. Mortimer said, it follows that financial reorganizations are necessary in a great many cases before the credit of the industry as a whole can be restored. This conclusion seems to be implied in Mr. Corey's discussion.

PUBLIC AID

Mr. Traylor's paper outlines the various forms of public aid, from desirable favorable public opinion to necessary public ownership. If the politicians do not face the facts and adopt the solution which such facts suggest they will have a far more serious difficulty on their hands in taking care of the problems of publicly owned utilities. They will lose a good political issue and at the same time have to carry the responsibility for inadequate street car service. As Mr. Traylor suggests, the disease will cure itself in time if the industry can survive during the period of treatment.

ARE FINANCIAL REORGANIZATIONS NECESSARY?

In conclusion Mr. Mortimer says:

> These several addresses all lead up to the question, "Are financial reorganizations necessary?" The question can be answered in either of two ways, except in the cases of those companies now undergoing the process of adjustment of their capital securities. It can be answered generally in the negative if we are to be satisfied with a policy of no expansion and a repetition of the experiences of the last ten years. It will have to be answered generally in the affirmative if the implied conclusions of the Federal Electric Railways Commmissson are accepted and if the credit of the industry is to be completely rehabilitated. Partly because of the comparative ease in answering the question and partly because of the short time available for a relatively long program, formal discussion of this query was abandoned by the committee on subjects.

Previous Methods of Railway Finance

An Outline of the Financing Methods Used from the Horse Car Days to the Present Time, with Comments as to Future Financial Methods with Guaranteed Returns on Fixed Values.

By JAMES F. FOGARTY
Secretary the North American Company

THREE decades have passed since electricity first succeeded the horse and cable as motive power in the field of street railway transportation. Not only has the old motive power been supplanted but there remains relatively little of the old plant except the franchise in some few cases. The amount of capital invested has greatly increased, but the business seems to be far less profitable today, in proportion to the capital invested, than it was when motive power carried names and had dams and sires.

The advent of electric power marked the departure from the practice of financing largely by capital stock, owned by a comparatively few people, and by earnings. It meant that the creation of security liens on physical property with a wider distribution of ownership came into prominence. Large sums of money were spent to bring about unified urban systems, successful independent lines and routes had to be purchased, electricity was substituted for horse and cable, new franchises were needed, and these contained expensive restrictions and provisions. Each successive step in the development was attended by large equity losses in discarded property, entailed substantial expenditures for replacements and additions and rendered necessary unceasing effort to procure capital under perplexing and changing conditions, made difficult by growing competition for funds from other fields. It is not surprising, therefore, that there were erected many financial structures which subsequently collapsed under their cumulative burdens.

The necessity of large future capital expenditures had not been clearly foreseen in the infant stages, and the early bond issues were almost invariably limited to small authorized amounts, exhausted before much progress had been achieved in development, as measured by present-day standards. When the era of consolidation was reached, therefore, there were outstanding closed mortgage obligations for which provision had to be made in addition to financing the costs of consolidation and further extensions of property. Out of this condition there came the refunding bond, of lien junior to the original or underlying issues, chiefly a second mortgage. By virtue of its character, the salability of such a security was more limited, and it became necessary to

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issue additional amounts of preferred and common stock as inducements to prospective purchasers.

The early years of the period 1890 to 1900 were marked by feverish intensity of promotions, consolidations and electrification, and the ensuing general business depression, which reached its maximum in 1897, was the forerunner of the first important traction reorganizations. The rebound which followed was accompanied by the lowest interest rates in the history of the industry, inducing rapid expansion and the development of interurban lines.

Various means were employed to effect amalgamations of financial structures as well as physical consolidations of separate lines. Refunding mortgages were created and by the deposit of escrow bonds of underlying issues became partial first lien. Collateral trust issues found markets abroad and large amounts of English and German capital were invested in these securities. Preferred and common stocks were issued to equalize differences in earning power of the various lines, acquire control and to provide equity not contributed through the sale of bonds. In the early '90s the holding company appeared, in some cases confined to the control of a single system, in others of several systems. It afforded a practical method of pooling interests and played an important part in centralizing control of properties later actually consolidated or leased under guarantees of fixed returns.

Some of Mr. Fogarty's Conclusions

Before the coming decade has rolled by refunding of large amounts of pre-war, wartime and post-war financing will have to be met and it is not unlikely that many financial reorganizations of electric railways will have taken place.

Future financial methods of electric railways will bear little resemblance to those of the past. Service-at-cost franchises may stimulate the interest of the investing public. Some assistance may be obtained by assessment of costs of extensions against abutting property owners or other beneficiary interests. Local sales of securities offer some possibilities. A security guaranteed by or carrying the faith and credit of the communities served may be the only solution if corporate ownership is to continue.

Measured by the standards of "cost of reproduction new," there is no doubt that the unified systems at first were overcapitalized, but measured by actual cost and benefits derived by the communities from the consolidated facilities the resultant capitalization, generally speaking, was not excessive.

Among the first of the electric railway consolidations was that in Milwaukee. There, also, occurred one of the first receiverships of a consolidated system and the first attempt to appraise and recognize consolidation costs. W. J. Clark of the General Electric Company, in testifying on the then reproduction cost as compared with cost investment of earlier years, stated:

> Probably on no large electric street railway system in the United States is there the necessity to charge off to depreciation so large a percentage of its original cost as in Milwaukee. The system having been constructed at an early period of electric railway development, when everything necessary to construction and equipment was far higher in price than at present, the company has naturally to meet a great shrinkage in values from decline in cost prices alone, while depreciation arising from usage has proved to be far greater than was estimated upon even as recently as two years ago. From the above two sources, neither of which could be estimated, appreciated or anticipated, it is safe to say that there has been an average shrinkage from the original costs on all of the company's physical property, outside of real estate and buildings, of more than 50 per cent.

Of that case, Judge Seaman of the federal court said:

> . . . I am satisfied that the property of complainant represents a value, based solely upon the cost of reproduction, exceeding $5,000,000. And I am further satisfied that this amount is not the true measure of the value of the investment in the enterprise. It leaves out of consideration any allowance for necessary and reasonable investment in purchase of the old lines and equipments, which were indispensable to the contemplated improvement, but of which a large part was of such nature that it does not count in the final inventory. No allowance enters in for the large investment arising out of the then comparatively new state of the art . . . I am clearly of the opinion that at least $2,000,000 of those preliminary expenditures is entitled to equitable consideration, as so invested, beyond the reproduction value . . .

This evidence is an illustration of the costs which are attendant upon consolidation and the methods of financing them.

Restoration of confidence in electric railway securities followed the business revival after the depression of 1897. Cheap money made refunding issues bearing interest as low as 4 per cent salable and promoters were encouraged to exploit new fields. The interurban railway promotions of the late '90s were the result of this combination of circumstances. The financing of the interurban lines differed from that of the urban systems in that it was possible from their inception to utilize first mortgage liens. The expected prosperity of the interurban lines failed to materialize, however, and with few exceptions their bonds became less popular and were salable only at increasing discounts. The succession of events from 1901 to 1910 was somewhat similar to that of the preceding decade. The easier money conditions of 1899 continued for several years and were followed in turn by the panic of 1907, which paved the way for a harvest of receiverships within the ensuing few years, notable among them being Chicago, Cleveland and New York.

The participation of electric railways in the prosperity which followed the dark days of 1897 soon strengthened their securities and in 1903 street railway bonds were admitted, under rigorous requirements, as legal investments for savings banks in the State of Massachusetts. Similar action by the legislatures of other states followed. This recognition of street railway bonds as gilt-edge securities, however, induced the imposing of restrictions on new issues. The provisions of some of the mortgages of the pre-consolidation period (1888-1890) and of the time of low interest rates (1899-1900), and of those of the succeeding years, present interesting contrasts and illustrate the growing limitations on the financing of new construction and additions. Instances were not uncommon of mortgages of 1888 to 1890 which permitted bonds to be certified and issued under resolution of the board of directors, merely stating the amount to be issued. Mortgages of five to ten years later required only certification that the cost of property to be constructed or acquired was not less than the proceeds of the bonds to be issued therefor.

During the succeeding years there were gradually introduced provisions which have had a far-reaching effect on financial methods of electric railways. Fixing of maximum interest rate and the requirement that net earnings equal one and one-half to two times the interest charges on all bonds outstanding, including underlying bonds and those to be issued, were among the first of those provisions. Then followed restriction of the amount of bonds issuable to 85, and later to 75, per cent of capital expenditures. Shortly thereafter the requirement that appropriations for maintenance and depreciation of property be not less than certain fixed proportions of revenues made its appearance.

STATE REGULATION BEGINS

Street railways after 1900 had not long enjoyed the reputation of being prosperous when public reaction toward this condition made itself felt. As early as 1903 agitation arose in Cleveland for a 3-cent fare, and by 1907 state regulation became a fact in New York and Wisconsin.

State regulation has had a marked influence on railway financing. Some of the early decisions, particularly of the commission for the Second District of New York, are classics. These decisions recorded the necessity of assurances that proceeds of security sales would, under rigid accounting procedure, be expended for revenue-producing extensions, and the necessity of earning power sufficient to insure proper return upon investments.

It was expected that assumption by the state of jurisdiction over utility security issues would remove such securities from the speculative class and give them a standing which would attract new capital to the business at lower costs. But the burdens imposed by regulation have remained and increased, while the implied assurances have lamentably failed. Had public regulation completely fulfilled its functions electric railway securities would not now be in such general disrepute.

COST OF MONEY INCREASES

The period 1911-1920 was one of steady increases in the cost of money to the traction industry. The bonds of ten representative electric railways sold in 1911 at prices producing an average yield of 4.88 per cent. In 1916 these bonds had fallen to a price level yielding 5.14 per cent, and by January, 1920, had further declined to a 7.10 per cent basis, an increase of about 47 per cent in yield rate in nine years. Preferred stocks of ten representative electric railways which had continuously earned and paid their dividends during the same period declined from a 5.41 per cent basis in 1911 to 6.08 per cent in 1916, and 8.60 per cent in January, 1920, a total increase in yield of about 60 per cent. Exemption of municipal securities from tax burdens and the ability of industrial enterprises to pay higher interest rates and refund tax deductions have contributed to the loss of the esteem which electric railway securities enjoyed in the late '90s.

The violent fluctuations in security prices since the beginning of the World War have had an important bearing on financial methods of all industrial and utility companies, and more particularly street railways. They found themselves unable to obtain funds at rates within the imaginary "reasonable return" to which they were limited by regulation, or within the rates earned under fixed franchise fares. Continuous additions to rolling stock and appurtenant equipment to comply with orders prescribing increased service necessitated the raising of funds in substantial amount. Existence of underlying and refunding mortgages with after-acquired property clauses prohibited the financing of these requirements by first-lien securities, if title to the equipment were vested in the operating company. Hence resort was had to the issuance of securities on new rolling stock owned by a trustee and leased to the company. This device, known as the "equipment trust," was borrowed from the days of steam railroad refinancing. Comparatively new in electric railway financing, the equipment trust has not yet gained a permanent place in the financial structure.

Many of the railways found it necessary to issue notes bearing high interest rates, but limited to from three to five years, as investors were reluctant to tie up funds for long periods. The continuous bidding for capital apparently had fostered the belief that income yields would be in the ascendency for a long time to come, and investors soon turned from three and five year notes to those bearing higher rates but of shorter term to permit more profitable reinvestment at maturity. Such notes required collateral security in the form of pledge of mortgage bonds, usually 125 to 150 per cent of the amount of notes. Assuming, as a hypothetical case, the issuance of 80 per cent, or $800 of bonds against $1,000 of capital expenditures, and the pledge of the bonds to secure two-thirds of their principal in face amount of notes, reimbursement for the $1,000 of original expenditures had to be derived from about $533 of notes, and, after deduction of discount, amounted to but little more than half the actual cash outlay.

After a brief period, realizing that the current high yields were not to be permanent, investors' views underwent another change, and short term notes gave way to notes bearing the same high rates for ten years, and even longer, or to bonds bearing equivalent interest rates, where provisions of newer mortgages permitted them to be issued.

PRESENT DECADE MOST IMPORTANT

The decade upon which we are entering will probably be the most important in the history of the traction industry. Before it has rolled by refunding of large amounts of pre-war, war-time and post-war financing will have to be met. Underlying bonds of lines forming the present unified systems, and indeed some of the refunding issues of consolidated companies, will mature within the next ten years. The problem of financial rehabilitation, staggering in itself, is augmented by a discouraging outlook for the procurement of the new capital necessary to provide adequately for normal increases in the business, and it is not unlikely that ere this decade has passed into history many financial reorganizations of electric railways, some voluntary and some involuntary, will have taken place.

Future financial methods of electric railways will bear little resemblance to those which the exigencies of the past have caused to be adopted. Service-at-cost franchises, with guaranteed returns on fixed values, may stimulate the interest of the investing public. Some assistance may be obtained by assessment of costs of extensions against abutting property owners or other beneficiary interests. Local sales of securities in small amounts offer some possibilities. A security guaranteed by or carrying the faith and credit of the communities served may be the only solution if corporate ownership is to continue.

Present Mortgage Requirements

A Satisfactory Franchise, Stable Net Earnings, Reasonable Renewable Property Reserves and a Good Margin of Net Earnings Over Necessary Interest Charges Will Restore Credit to the Electric Railway Industry.

By F. K. SHRADER
Halsey, Stuart & Company, Chicago

THE electric railway business has an invested capital of more than $5,000,000,000 and a gross annual business of more than $730,000,000. Eleven times as many passengers are carried annually as on all the steam railroads combined; in fact, the elevated and subway lines alone carry more passengers than all the steam roads together. Aside from the mere significance of size the industry is so inseparably bound up with the general welfare of the public that its problems in reality become public problems, and the tendency toward realization of this fact is the most encouraging feature today in the industry's situation.

Statistics of track built, as published by the Census Bureau, show a marked slowing up in the expansion of the business to meet the demands of an ever-growing population. Electric railway mileage in the five-year period 1907-1912 increased nearly 20 per cent, while in the subsequent five years it increased only 9 per cent. Passengers carried and revenue car mileage showed a similar slackening of pace, and without doubt the tendency in this direction since 1917 has been even more pronounced.

Prerequisites Essential to Railway Credit

According to Mr. Shrader, the most essential prerequisite to electric railway credit is a satisfactory franchise situation. Investors are not now in a frame of mind to place their funds in an electric railway property unless they are convinced that the basic rights and privileges to conduct a paying business are fully protected. Two important developments in this field have taken place, viz., the so-called Wisconsin indeterminate permit and the service-at-cost franchise. The flexible fare franchise is without doubt economically correct, but in practice it has not yet measured up to expectations from a credit standpoint. The goal toward which the industry must strive is regulation, practically automatic in its operation and sufficiently responsive promptly to administer adequate relief in periods of high costs, so as to enable the railways to maintain their earning power and credit.

ELECTRIC RAILWAYS NOW CONSIDERED HAZARDOUS AS INVESTMENTS

Electric railway securities today are decidedly unpopular with the investing public, due to the many defaults and reorganizations in the past. At present, according to the recently published report of the Federal Electric Railways Commission, nearly 18 per cent of the total mileage of the country is in the hands of receivers, including the properties in many of our more important cities.

The inevitable result of this has been that the electric railway business is regarded by the investing public as more hazardous than that of any other public utility and consequently its discrimination is reflected in the higher rates of interest demanded for capital, if obtainable on any terms, and the constantly narrowing field of investors in electric railway securities.

Operating expenses have been absorbing an ever-increasing proportion of gross earnings and interest charges an ever-increasing proportion of net earnings. Net earnings in 1902 covered interest charges substantially twice over, while in 1917 the ratio was but one and a half, the showing since then undoubtedly being considerably worse. In 1917 the entire industry with an invested capital of $5,000,000,000 paid dividends aggregating barely $73,000,000, and on more than half of the total outstanding capital stock no dividends at all were paid. The financial results as thus indicated are by no means sufficiently encouraging to attract the necessary capital properly to develop our urban and interurban transportation systems. Before this desirable end can be attained or even approached there must be established a period of stable and adequate net earnings after all operating costs have been met, including full allowances for proper upkeep of the properties and maintaining the integrity of the investment therein. I have no patent remedy to suggest to cure the financial ills of the industry. The subject is vastly too complex for any simple solution, and must engage the serious thought and conscientious effort not only of financial leaders and the industry itself but of public authorities as well.

MORTGAGE SECURITIES

The few suggestions I have to offer relate to mortgage securities and therefore I wish to distinguish such securities as constituting a lien against the property, evidenced by a contract termed a mortgage or trust deed and containing specific terms of interest rate, character of lien, maturity, redemption provisions, conditions governing the issuance of additional bonds, provisions relating to the upkeep of the property, remedies in case of default, and other provisions of similar character. Short term notes secured by specific pledge of mortgage bonds may be classed as of the same general character as mortgage bonds, as essentially they rely for their security upon the collateral pledged. The distinction I wish to bring out is between mortgage bonds and share capital or other forms of so-called junior securities. While the latter occupy a very important position in public utility finance, it is not the purpose of this paper to deal with them except in a secondary way as directly related to the senior securities.

FUNCTION OF INVESTMENT BANKER

I have sometimes wondered if the function of the investment banker is at all generally understood. Contrary to the opinion held in some quarters, he does not impose the terms and conditions in the issuance of securities to suit his own particular whims or fancies,

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TABLE I—SHOWING EQUITY REPRESENTED BY EXCESS COST OF PROPERTY OVER BONDS ISSUED BASED UPON THE ISSUANCE OF $100,000 PAR VALUE OF BONDS EACH YEAR

At the End of Respective Years	Bonds Issued at Various Percentages of Cost of Property				
	70	75	80	85	90
First year	42,857	33,333	25,000	17,647	11,111
Second year	85,714	66,667	50,000	35,294	22,222
Third year	128,571	100,000	75,000	52,941	33,333
Fourth year	171,428	133,333	100,000	70,588	44,444
Fifth year	214,285	166,667	125,000	88,235	55,556
Sixth year	257,142	200,000	150,000	105,882	66,667
Seventh year	299,999	233,333	175,000	123,529	77,778
Eighth year	342,856	266,667	200,000	141,176	88,889
Ninth year	385,713	300,000	225,000	158,824	100,000
Tenth year	428,571	333,333	250,000	176,470	111,111
Eleventh year	471,428	366,667	275,000	194,117	122,222
Twelfth year	514,286	400,000	300,000	211,761	133,333
Thirteenth year	557,143	433,333	325,000	229,412	144,444
Fourteenth year	600,000	466,667	350,000	247,059	155,556
Fifteenth year	642,857	500,000	375,000	264,706	166,667
Sixteenth year	685,714	533,333	400,000	282,353	177,778
Seventeenth year	728,571	555,667	425,000	300,000	188,889
Eighteenth year	771,429	600,000	450,000	317,647	200,000
Nineteenth year	814,286	633,333	475,000	335,294	211,111
Twentieth year	857,143	666,667	500,000	352,941	222,222
Twenty-first year	900,000	700,000	525,000	370,588	233,333
Twenty-second year	942,857	733,333	550,000	388,235	244,444
Twenty-third year	985,714	766,667	575,000	405,882	255,556
Twenty-fourth year	1,028,571	800,000	600,000	423,529	266,667
Twenty-fifth year	1,071,429	833,333	625,000	441,176	277,778

but does endeavor to discern and meet the demands of the investing public to the end that capital may be provided for worthy enterprises. The investment banker's most valuable asset is his reputation, as the foundation of his whole business is confidence. Therefore, he is vitally concerned in seeing that the securities he sponsors are safeguarded to the fullest extent. He may rely to a certain extent upon the expert legal, accounting and engineering help he calls to his side, but in the field of economic and business phases of finance the investment banker is called upon to exercise the most unrelaxing care and mature judgment.

In reaching a conclusion upon the merits of a mortgage security there are certain considerations that must be analyzed and weighed. The two cardinal fundamentals of any investment are safety of principal and assurance of income. Safety of principal, aside from general credit considerations, depends in large measure upon the proportion of the loan to the value of the security offered. It is for this reason that in a properly drawn mortgage there is a provision restricting the issuance of bonds as new property is added to a certain percentage of the cost or fair value of such property, thus always maintaining an equity in the property over and above the bonds. The relative size of the equity thus created is determined by the rapidity with which bonds are put out and the percentage at which they are issued in relation to the cost of the property. Table I illustrates the importance of holding down the proportion of bonds issued against additions to property. It also shows the equity represented by the excess cost of property over bonds issued there against, based upon the issuance of $100,000 par value (merely taken as a convenient unit for calculation) of bonds each year. As between the extremes assumed in the table, viz., the issuance of bonds at 70 per cent of cost and at 90 per cent of cost, in the course of twenty-five years there will have gone into the property against the same amount of bonds issued nearly $800,000 more under the 70 per cent ratio than under the 90 per cent ratio.

MARGIN OF NET EARNINGS NECESSARY OVER INTEREST CHARGES

Assurance of income depends upon the ability of the corporation promptly to meet its interest obligations and it is customary to provide in the mortgage that bonds cannot be issued unless the net earnings for the preceding year are equal to a prescribed percentage, say 175 or 200 per cent (usually stated in the form of a ratio—1¾ or 2) of the annual interest requirements. Frequently also the issuance of bonds is conditioned upon gross earnings being equal to a certain number of times bond interest.

Table II indicates the measure of protection afforded by these restrictions as to earnings and interest charges. This table shows that under a specification that gross earnings be six times and net earnings twice the interest charges, the amount of bonds outstanding against the property (assuming they bear 6 per cent interest) would be only two and three-fourths times the annual gross earnings, a very conservative proportion, indeed. Furthermore, under the specification of 6 and 2 just noted there is sufficient margin provided in the structure to permit operating expenses to increase as much as 25 per cent with no increase in gross revenues and still meet interest charges. Taking the other extreme of the table where gross is specified as only three times and net earnings as only one and one-quarter times interest charges, we find the property would then have bonds outstanding to the extent of five and one-half times gross earnings, leaving so little leeway for increases in expenses (or loss of gross revenues) that the property could continue to meet its interest charges under only the most favorable operating conditions; if interest charges were only barely covered the proportion of operating expenses to gross revenues could not exceed 66 per cent.

INCREASING RATIO OF DEBT TO TOTAL CAPITAL

The figures just presented bring out the importance of limiting indebtedness to some conservative relation of its value and revenue producing capacity. Unfortunately the tendency has been decidedly in the opposite direction, but it must be corrected if the proper credit is to be established. To show that the past tendency of financing has been to borrow rather than sell share capital the figures in Table III were prepared. In 1902, 57 per cent of the total capitalization of the electric railways was represented by capital stock, and but 43 per cent by funded debt, while fifteen years later the proportion represented by capital stock had fallen to 45 per cent and funded debt had increased to 55 per cent. A similar situation, although not quite so pronounced, exists in the case of the steam railroads, and it is a pretty generally accepted fact that the decline in credit of the steam roads over the past fifteen years has been due to the tendency to finance through borrowings.

TABLE II—RELATION OF DEBT TO EARNINGS

	Assume { Gross 6 x Int. / Net 2 x Int. Amount of Bonds Would Then Be (at 6%) 2¾ Times Gross	Assume { Gross 5 x Int. / Net 1¾ x Int. Amount of Bonds Would Then Be (at 6%) 3⅓ Times Gross	Assume { Gross 4 x Int. / Net 1½ x Int. Amount of Bonds Would Then Be (at 6%) 4⅙ Times Gross	Assume { Gross 3 x Int. / Net 1¼ x Int. Amount of Bonds Would Then Be (at 6%) 5½ Times Gross
Gross	600	500	400	300
Operating	400	325	250	175
Net	200	175	150	125
Bond interest	100	100	100	100
Balance	100	75	50	25
Operating ratio	66⅔	65	62½	58⅓
Amount expenses may be increased and still meet interest charges	100	75	50	25
Per cent	25	23	20	14
Operating ratio would then be	83	80	75	66

The physical property of an electric railway is subjected to hard usage and therefore deteriorates quite rapidly. The failure to make adequate provision for physical upkeep has caused large losses to security holders in the past and is responsible in no small measure for lack of credit today. The modern street railway mortgage must adequately safeguard the investor in this respect through establishment of a definite maintenance and renewal fund, the operation of which will maintain the property at full operating efficiency. The customary method is to require the establishment of a fund based upon the gross earnings of the property, all current and deferred maintenance, renewals and provision for obsolescence to be charged against this fund, and any unexpended balance to be invested either in improvements to the property against which no bonds may be issued or used to retire bonds. No set rule can be followed in determining the required percentage of gross earnings; each individual case must be worked out on its own basis, taking into account the local factors involved. As a rough indication of the limits, however, it has been found in electric railway operation to require from 15 per cent to 25 per cent of gross earnings properly to provide for full upkeep of the physical properties.

TABLE III—PROPORTION OF FUNDED DEBT AND CAPITAL STOCK TO TOTAL CAPITALIZATION

	1917	1912	1907	1902
Electric railways:				
Capitalization	$5,532,223,818	$4,714,665,386	$3,778,831,901	$2,308,282,099
Capital stock	2,473,846,651	2,379,346,313	2,097,708,856	1,315,572,960
Per cent of total	44.7	50.5	55.5	57.0
Funded debt	$3,058,377,167	$2,335,319,073	$1,681,123,045	$992,709,139
Per cent of total	55.3	49.5	44.5	43.0
Steam railroads:				
Capitalization	$21,092,072,245	$19,752,536,264	$16,082,146,683	$12,134,182,964
Capital stock	9,058,682,733	8,622,400,821	7,356,861,691	6,024,201,295
Per cent of total	42.9	43.7	45.7	49.6
Funded debt	$12,033,389,512	$11,130,135,443	$8,725,284,992	$6,109,981,669
Per cent of total	57.1	56.3	54.3	50.4

SINKING FUNDS NOT ADVISABLE

Sinking funds are found in some of the earlier electric railway mortgages, but the present tendency is to omit them, on the theory that an electric railway is permanent property and not of a wasting character. Moreover, it would be an injustice to the public to be charged rates which would retire the indebtedness created to build a property, and thus leave the property free of debt in the hands of the stockholders. On the other hand the investor must be safeguarded, and this can be accomplished only, first, by seeing at the outset that the bonded debt is not excessive in relation to the value of the property; second, that this equity once established is maintained, through financing a considerable proportion of the new money requirements on junior securities, and, third, that the physical condition of the property is kept up to a high standard through adequate appropriation of earnings for this purpose.

COMPLICATED FINANCIAL STRUCTURES

An impediment to economical finance often met in the electric railway field is the complexity of the financial structure. The earlier mortgages, with their small authorized issues and fixed rates of interest and maturities, were inelastic and not capable of expansion to meet the growing needs of the properties which they covered. The result in a great many cases is a patchwork of finance which sooner or later must be recast into a simple structure capable of expansion to meet the financial needs of a growing property. The modern mortgage therefore provides for either a very large or an unlimited authorized issue, emissions therefrom to be issued in series from time to time as the needs of the corporation may dictate, each series to be of such amount, to bear such rate of interest, to mature at such date, to be redeemable at such time or times and at such price or prices as the board of directors of the corporation may determine at the time of issuance. The issuance of these bonds is conditioned upon the observance of fundamental restrictions as the proper relation of debt to property values and earnings, but the purpose is to extend to the corporation the maximum degree of flexibility in its financing consistent with adequate protection to the security holder and thus enable the corporation to economically finance its requirements under changing conditions.

SATISFACTORY FRANCHISE NECESSARY

Perhaps the one most essential prerequisite to street railway credit is a satisfactory franchise situation. Investors are not now in a frame of mind to place their funds in a street railway property unless they are first thoroughly convinced that the basic rights and privileges to conduct a paying business are fully protected. In recent years two very important developments in this field have taken place, viz., the granting of so-called indeterminate permits, as practiced in the state of Wisconsin, and the movement toward service-at-cost franchises. While the underlying principle of the cost-of-service or flexible fare franchise is without any doubt economically correct in practice it has not yet, so far as I am aware, measured fully up to expectations from a credit standpoint. The goal toward which the industry must strive is regulation, practically automatic in its operation and sufficiently responsive promptly to administer adequate relief in periods of high costs and thus enable the corporation to maintain unimpaired its earning power and credit. The public must come to recognize that the utility business is essentially public business, and for their own welfare it must be accorded the earning power to enable it to function properly.

FEW RAILWAY SECURITIES NOW MARKETABLE

At the moment, there are but few electric railway companies that can fulfill the requirements of the investment market. If net earnings can be improved and stabilized; then they may look forward to an increasing ability to finance by mortgage securities. Their escrow bonds may later become marketable when interest rates fall appreciably below present levels.

Any electric railway company that can show stable earnings through the war period, as well as conservative practice in accounting for maintenance and replacements and in computing net earnings, can find a market today for an issue of well secured mortgage bonds of sufficiently high coupon rate to meet the market when not preceded by too large a proportion of prior lien securities. The interest yield requirements unfortunately are necessarily greater than a light and power corporation of similar size and setup.

Home-Town Financing

Short-Term Notes in Best Demand, Sold for Cash Across Counter or by Special Type of Salesmen—Partial Payment Not Favored—Nominal Charge Made for Resale Service.

By S. B. WAY
Vice-President the Milwaukee Electric Railway & Light Company

"HOME-TOWN FINANCING" is construed in this discussion as the local distribution of an investment security in the name of an issuing company. Such a happy means of financing is ideal. If each community were owned by its patrons, there would be universal satisfaction with service and acquiescence in rates of fare that approach the actual cost of service.

The idea is not new. Many abortive attempts at home-town financing were made in connection with the organization of street railways. In their modest beginnings street railways were the product of home-town enthusiasm and the critical attitude did not develop until some impersonal absentee stockholder was persuaded to hold the bag.

It was a foregone conclusion that outside capital would be required to finance the early street railway; the locality could only trade out its enthusiasm in its own wonderful future for some one else's ready cash and hope of profit.

This resulted in the complicated financial structure which the usual street railway passenger often views with open suspicion. Securities had to be developed to suit a variety of tastes and fit various methods of distribution. A variety of expedients had to be devised to make an engraved certificate more attractive. Bonds for long-time investors required special promises and the skilled services of investment bankers before being ultimately distributed. Bond-secured notes required the same method of placing. Preferred stocks required more speculative appeals until after becoming properly seasoned and of good repute they reached a fixed investment placing. Common stock usually failed to proceed very far on the road to distribution. Its only appeal lay in keeping intact large blocks which presumably carried with them some measure of control.

The creation of outside markets resulted in the investment banking business. The street railway industry owes it some debt for its labors, for without these the horse cars would still be with us.

It is not surprising, therefore, that the problem of financing the street railways should be considered a business separate and distinct from the problem of running the cars. It is not surprising, also, that the recurrence of the idea of home-town financing should early meet the opposition of investment bankers. It has been realized, however, from the brief experience obtained in new home-town financing that the distrust, the criticism and the disregard of the rights of investors by the local public have begun to disappear, adding safeguards more substantial than promises to the holders of securities distributed by investment bankers. This realization is evident from the approval of home financing contained in the recent report of the committee on public service securities of the Investment Bankers' Association of America:

> During the development of the utility systems the centers of finance have been appealed to for provision of the large investment funds required, and this has resulted largely in dissociating local communities and the customers of utilities from financial interest in utilities. The public served has felt little or no responsibility to absentee owners and local antagonisms to efficient utilities have often resulted. It is in the public interest that the securities of utilities be owned in large part by the communities served, so that the public need for adequate and efficient service may be supported by the self-interest of the individual owner of local securities. . . .
>
> The practice of local utility security distribution is encouraged by bankers. Making the public responsible, to the extent of the local distribution, for the fair treatment and the prosperity and success of the enterprise, it encourages thrift and affords an investment opportunity not usually open to small investors; it affords local critics of managers and operatives tending to alert regard for the interests of both the property and the public; it improves the morale of the employees by keeping them in touch with the real owners of the property, and it is in effect a form of modified public ownership under private control and operation which is probably the most efficient status of all utility enterprises.

Local placing of securities under the usual methods of distribution is difficult. Analyses of the kind and variety of security holders show that but small amounts of securities distributed in the usual way land in the hands of local investors. When so held they are found among the well to do, whose local influence upon public opinion is not appreciable. Even where local holdings are so appreciable as to provide listing on the local stock exchange the investment class is so unimportant that the prominence given invites rather than discourages "bear" movements by the politicians.

THE PLAN AS USED IN MILWAUKEE

It is not surprising, therefore, that a large number of utility properties have found it to their interest to examine the possibilities of home-town financing and to take an occasional flier in that direction. During the war, especially, traction securities "enjoyed" an unusual amount of ill repute among the clientele of the investment banker. The experience of traction companies and the publicity given to their hardships and political entanglements served to create uncertainty about their ultimate values, and the market became very limited and finally disappeared. The stringent provisions of the federal income tax tended further to destroy whatever market was left for the securities of those traction properties whose reputation had not yet been lost. In fact, practically the only investor who still has any faith in traction companies lives in the home town.

Experience has proved that with the home-town investor the value of physical property is of more interest than market value; past reputation for paying all obligations on the date due is of more significance than interest cover, margin of safety, investment rating.

S. B. WAY *has for the past seven years been vice-president and general manager of the Milwaukee Electric Railway & Light Company. Prior thereto he had been vice-president and assistant general manager in charge of the light and power departments since 1911. Mr. Way has also been actively interested in the management of the Wisconsin Gas & Electric Company, operating in Racine and Kenosha, the Watertown (Wis.) Gas & Electric Company, the Burlington (Wis.) Electric Light & Power Company and the North Milwaukee Light & Power Company, all of which are identified with the North American Company. For nearly twenty-five years Mr. Way has been connected with the public utility business and during practically all of that time he has been associated with the interests of the North American Company. For that reason he is extremely well fitted to analyze the subject of home financing, for during the past few years the utilities under his direction have utilized on several occasions this means for obtaining new money.*

privileges, tax exemptions, special restrictions and all of the other special enticements that have grown up as integral parts of the general security investment market. The home-town investor is interested in simplicity, and the usual so-called "window dressing" is a detriment, rather than an advantage.

It is essential, therefore, before offering securities for local sale, either by franchise agreement or commission order, to have established the fair value of the traction property and the reasonable earning power in respect of such value. The patron public can then be safely invited in if the security offered for sale is safe when considered by these standards.

Some of the advantages and disadvantages of local holdings of securities are: A better local understanding of the economics of the business, which is prompted by self-interest and which carries with it better public relations. This has made unscrupulous attacks by the issue-seeking politician actually unpopular. A sufficiently wide distribution among the railway patrons should form a more logical basis of public ownership than municipal ownership. The advantages of supplementing general financing plans through local financing, thus increasing the amount of money raised, must not be lost sight of, and mention may be made of the desirability from the traction company's standpoint of any issue of securities which does not carry restrictions which may be burdensome when the company is again required to resort to its credit. The disadvantages, if there are any, arise from efforts necessary to the maintenance of a good reputation and to adequate publicity of the company's business and the restricted ability of local investors to absorb securities.

A Salient Statement by Mr. Way

A sufficiently wide distribution of its securities among the traction company's patrons should form a more logical basis of public ownership than municipal ownership. The advantage of supplementing general financing plans through local financing, thus increasing the amount of money raised, must not be lost sight of and mention may be made of the desirability from the traction company's standpoint of any issue of securities which does not carry restrictions which may be burdensome when the company is again required to resort to its credit.

SECURITIES ADAPTABLE FOR LOCAL SALE

All classes of securities are not equally adapted for home-town distribution. Only those that carry an obligation to pay interest or a preference as to dividends should be offered. Prior issues subject to wide fluctuations in market value and yield should never be offered the small local investor. Until market values and earnings are thoroughly established an issue not heretofore sold by dealers should be selected for local distribution.

For some reason long-term securities seem not to sell well locally. Five-year maturities appear to have the strongest appeal, although a substantial percentage of preferred stock and ten-year maturities has been sold in connection with five-year maturities in certain instances. This makes it desirable, where notes are offered, to include a provision for conversion into preferred stock or bonds of longer maturity. It is also important to provide a wide selection of denominations in the issue of notes or bonds. Denominations of $50, $100, $500 and $1,000 have proved practical. If preferred stock is sold it is more important to pay dividends in cash than to include a cumulative feature.

Experience indicates that five and ten-year notes together sell in about twice the volume of preferred stock. In the local sale of one issue of over $3,000,000 of five-year notes, 1,737 were of $50 denomination, 1,592 of $100, 1,493 of $500 and 1,663 of $1,000. These notes were sold to 4,064 individuals, of whom 1,394 were women, the average sales being $659 per buyer. A recent issue of $500,000 of preferred stock sales was made to 753 individuals, of whom 195 were women, the average sales per buyer being $664.

Methods of effecting sale of home-town securities must be determined by local conditions. There is an important advantage in literally selling securities "across the counter" at the company's offices. All printed advertisements and circulars should prominently feature the company's name and be signed by it. Salesmen handling prospects need not have had previous security sales experience. It is more important that they understand how to deal with the public courteously and efficiently. As most of the local buyers are not accustomed to purchasing securities they are not familiar with the technical terms of the investment banking house. Hence on the salesman's part familiarity with the company, the article it sells, and the business it does are most important, and ready and truthful answers to simple questions are of more value than long-winded expositions. Familiarity with every reference to the local company in the community papers and intelligent discussion thereof are also essential. It is important from the start to fix in the minds of timid, first-time buyers that the sale of its own securities is a permanent part of the company's activities and that those facilities will be constantly at the service of its customers.

Experience discloses that a very large proportion of actual sales is uncovered by newspaper advertising. Such advertising should tell the story of the company in simple language, avoiding technical financial terms, and departing radically from the typography and conventional style of the usual financial advertisements. Why the securities are being sold, what the proceeds are to be used for, governmental authority and safeguards under which issued and terms of payment are points which must be covered in the advertisements. If the company is under state or local regulation the fact that an implied regulated minimum return assures stability and eliminates speculative hazards is an important selling point. Thrift talk is always helpful. Inquiries through personal call or mail should be followed up as promptly, persistently, carefully and tactfully as complaints in a well-organized complaint department. The effort should be jointly one of improving public relations and selling securities, and all salesmen should be able to close the transaction, deliver securities and receive payment. The small investor expects the company to have sufficient confidence in its agent, who answers questions about the company's affairs, to entrust him with the securities he sells, particularly as the customer is expected to trust the same agent with his money.

To the individual unaccustomed to dealing in securities, an offer to sell below par suggests a bargain sale of damaged or shopworn goods. Such investors think of their return only in terms of the stipulated dividend or coupon rate. Sales at par carry the presumption that the securities are worth their face amount and avoid the suggestion of possible further depreciation in value when the customer may wish to sell. All adjustment for accrued interest and dividends should be simple, as inexperienced buyers of securities find it difficult to understand such adjustments. One simple solution is to omit the interest period and amount on the first coupon and fill in this information properly on the date of purchase. Partial-payment plans, with their complications, should be avoided. The customer should be urged to purchase only the amount of securities for which he has cash available. Coupons should be cashed at the same counter at which sales are made. This gives further opportunity for sales effort.

The maintenance of the market for securities sold only by the company is of great importance. Confidence in the value of the securities is best developed by a continuous market at least equal to the original purchase price. Except in cases where holders have real need for cash invested in securities the ability to sell readily at cost dispels the desire to sell. It is not necessary or desirable to resell securities for customers without charge. A nominal charge of, say, one point, while imposing no burden on the customer, at the same time operates to act as a deterrent against unnecessary and ill-considered selling.

Maintenance of the market power does not mean that the company buys back its own securities. Since the proceeds thereof have been invested in permanent improvements it is impossible for it to do so, and there is no difficulty in making it understood that its security sales department merely places its distributing facilities at the disposal of the customer, taking the securities on consignment for resale. Experience indicates that the amount of securities so handled has been very small, even during recent periods of very high yields in the general investment market.

With sales of such small transactions as have been under discussion a large proportion of the purchasers are investors of the savings bank type, accustomed to savings bank interest, safeguards and conveniences. Such persons are slow to sell. When they are compelled to liquidate their savings they have definite and legitimate reasons and must be protected from note shavers and speculators by having a stabilized market and a means of reaching it at a nominal cost. The favorable experience of such people brings more buyers among their friends and establishes a very favorable proprietary local interest in the company.

The idea of home-town financing is not novel or in its experimental stage, but it is a reversion to the type of financing attempted at the beginning of the traction industry. It carries with it all the obvious advantages flowing from a proprietary interest on the part of patrons. When approached from the first simple and rudimentary principles of finance it is not a difficult method of distributing securities or beyond the successful organizing abilities of public utility operators. Its contribution to the financial requirements of the traction industry cannot be expected to be sufficient to solve the problem of financing and refinancing. But it can be made a substantial help. It carries with it, perhaps more than any other method, improved public relations.

Financing a Public Utility by Sale of Stock

For Sound Financing Not More Than One-Half of Net Earnings Needed for Interest Payments—Sale of Stock Urged for Extensions and Betterments—Investment Banker Has Not Lost Faith

By CHESTER COREY
Vice-President Harris Trust & Savings Bank, Chicago, Ill.

IT MAY seem absurd to talk about selling the stock of street railway companies when there is no general market for even their first mortgage bonds. It is well to remember, however, that history often repeats itself and that the market price of the stock of a company may advance within a comparatively few years from a nominal figure to a sufficiently high price so that the company can raise money by issuing and selling additional stock. For instance, in 1896 the common stock of the newly reorganized Atchison, Topeka & Santa Fé Railway sold as low as 8¼ and the preferred stock as low as 14⅜; in 1901 the common stock sold as high as 91 and the preferred stock as high as 108, though it should be borne in mind that the reorganization was made on a sound basis and that the management of the property was of the very best.

A public utility company within the last ten years found its cash resources so depleted that common stock dividends had to be discontinued, and an emergency loan became necessary to save a default in the payment of bond interest. Within less than two years of that time that same company sold to its customers several million dollars of a newly created preferred stock, all because a conservative financial policy was adopted and adequate depreciation reserves were set up out of earnings.

SAFE PERCENTAGE OF NET FOR INTEREST

The great mistake of corporate financing has been the creation of funded debts to an amount unduly large in proportion to the amount of the total investment. The experiences of the last three years have shown that a company cannot pay out 75 per cent of its net earnings as interest charges and maintain its credit. If a company pays out 35 or 40 per cent of its net earnings in interest and has a substantial amount remaining after providing for depreciation and other reserves and the payment of dividends, that company has credit and can raise money by selling additional stock as soon as the investing public is convinced that the favorable showing is permanent and not temporary. However, all of the mistakes of the past should not be charged to the companies or the rate regulating bodies. The banker has oftentimes shown poor judgment in failing to distinguish between sound and unsound financial structures.

The unfortunate financial position of the street rail-

CHESTER COREY, *vice-president Harris Trust & Savings Bank, Chicago, has been actively associated with the financing of public utility properties for some twenty years. It was in Boston in 1894 that he first became connected with N. W. Harris. In 1907 he transferred his headquarters to Chicago. During this long period of service Mr. Corey has been prominently associated with the financing of public utilities in practically every large city in the country. He is a firm believer in the idea that the total capitalization of a utility should not be in excess of the fair value of the property and that the funded debt should be but a subordinate part of the total.*

ways arose primarily out of the slowness of the public, acting through the rate regulating bodies, to realize that street railway operating costs had increased by leaps and bounds and had in many cases absorbed all of the 5-cent fare and more. Bonded debts in many of these cases were too heavy to allow for much if any shrinkage in earnings without immediate trouble; or, in other words, many companies had failed during times of prosperity to provide proper equities by selling their capital stock. There were too many creditors and too few partners.

THE FOUNDATION OF RECONSTRUCTION IS A REASONABLE FARE

The credit reconstruction problem of the street railways is not an easy one, but the foundations are sufficient fare to yield generous returns on investments and a funded debt which will require the payment of interest charges amounting to not more than one-half and preferably not more than one-third of net corporate earnings.

As a part of the reconstruction program the sale of stocks must ultimately play an important part, and each company should raise substantial amounts of money for any extensions and additions, including new equipment, by selling its stock, preferably in the community which it serves.

During the recent troublesome times some companies have sold stock to customers and employees; in fact, this method of financing has saved the day for many of the public utilities, and not only has the necessary money been raised but local communities have become interested in the financial welfare of "their company."

ELECTRIC RAILWAY MUST COMPETE FOR MONEY IN THE OPEN MARKET

Inasmuch as the rates of fare, service, accounting and the issuance of securities are supervised in almost all communities, there is little danger that unduly large dividends can or will be paid. Generous dividends, however, must be paid and comfortable surpluses must be earned if the public utilities are to function properly in the forward progress of the country.

The public is learning that capital is not attracted unless generous returns are assured. Rates of return are too high on the best securities, such as government and municipal bonds, to make old rates of interest attractive. If the public utilities are to obtain the money necessary for them to give the service the public demands, they must be allowed earnings sufficient to compete in a market for money when the demand exceeds the supply.

The investment banker has not lost his faith in the electric railways and will be willing to buy mortgage bonds of these corporations as soon as the rate regulating bodies are able to convince the investing public that public sentiment is well established in favor of determining the value of the electric railways and allowing them to earn substantial returns upon their investments after providing for operating expenses, maintenance, taxes, interest and full depreciation. It will be up to the companies themselves, however, to provide and maintain substantial equities in their properties over and above the amount of bonds outstanding and to make their principal effort to raise money by the sale of stock rather than to try to borrow the last available dollar by the issue and sale of bonds.

Municipal Aid in Railway Financing

Local Transportation Systems Essential to Community Life—Service-at-Cost Franchises Recommended—Municipal Credit Might Be Offered for Extensions—State Commissions Should Have Power to Regulate Fares

By **MELVIN A. TRAYLOR**
President First Trust & Savings Bank, Chicago

THE development of our local transportation systems has been both a cause and an effect of the spreading out of our municipalities. The extension of municipal boundaries would not have been possible without the development of the electric lines. On the other hand, the lines would never have developed to the present extent were it not for the fact that in this country people are not accustomed to live within walking distance of their place of business. In continental Europe the business man often lives above his business and the laborer next door to the factory in which he works. Such a development, however, has certain unfortunate social results. In Chicago and New York this would mean more tenement houses in which the people would be herded together like cattle. This in turn would mean a development of all that social unrest which a few decades ago we called "anarchy" and now call "bolshevism."

COMMISSION REGULATION AN AID TO RAILWAYS

At present little is being done for the further improvement and development of local transportation facilities; in fact, the very maintenance of existing systems is being called into question. The immediate cause is that the cost of everything has increased largely, and the companies which had great difficulty in getting along on the 5-cent fare are now finding it utterly impossible to do so. Had it not been for the advent of state commissions with power to regulate rates of fare the electric railway industry would have become hopelessly bankrupt. In general there has been a total lack of municipal aid at the right time and in the right way. It has been claimed that the "greedy corporations" were violating their contracts by increasing fares and that their property ought to be taken over by the city so that the original agreement might be carried out. People of intelligence knew very well that in such an event the deficit would have to be made good by increased taxation, but as taxes are paid by the few and not the many, and politicians are interested in the many and not the few (since each of the many has a vote) the facts in the case made little difference. So, when a street railway franchise expires or its termination can be foreseen, the fact seems to be contemplated with a grim satisfaction by

MELVIN A. TRAYLOR, *since Jan. 1, 1919, president First Trust & Savings Bank, Chicago, began his banking experience as cashier at the Bank of Malone, Tex. Two years later he was appointed cashier and then vice-president of the Citizens' National Bank, Ballinger, Tex. Upon consolidation of this bank with the First National Bank he was elected president of the combined institution. In 1911 he became vice-president of the National Stock Yards National Bank, East St. Louis, and in 1914 went to Chicago as vice-president of the Live Stock Exchange Bank, later succeeding to its presidency, which position he left to enter upon his present duties. Mr. Traylor has some very definite ideas about the future of electric railway financing, the kind of ideas that somehow should be got home to the public. He is keenly aware of the difficulty of the situation in Illinois, where politics seems to be running rampant with the public utilities as the principal sufferers.*

all politicians, and the opportunity is immediately embraced to create a political issue, of which there is at all times great dearth.

RECOMMENDATIONS FOR REMEDIES

How shall we remedy this situation? Probably the best way is to follow the recommendations made in the report recently issued by the Chamber of Commerce of the United States of America. The plan is based upon the following propositions:

> (a) That users of the service should pay only the actual cost of providing such service.
>
> (b) That cost of service includes all outlays for operation and maintenance, provision for renewals and replacements, taxes and fair compensation for the capital actually and necessarily used in the service of the public based upon an agreed valuation of the property, irrespective of stocks and bonds outstanding.
>
> (c) That the revenues from fares should at all times be sufficient to pay all costs necessary to the supplying of efficient service, of the extent and standard designed by public authority.
>
> (d) That the rate of fare should automatically increase or decrease to correspond with any substantial increase or decrease in costs.
>
> (e) That the city may, if it should so determine in the future, acquire the property on an agreed basis of actual values.
>
> This plan contemplates that ultimate direction of the extent and character of the service to be given and the facilities to be provided shall reside in a city official or board. The company is bound to provide such facilities and service as the public through its official agent requires, and the public, on the other hand, is bound to provide from the fares paid the means to meet the outlays thus imposed.

Under such a plan the rate of fare would automatically increase or decrease to correspond with any substantial increase or decrease in costs, for the public desires and is entitled to the best service and ought to be willing to allow the company, or, for that matter, a municipally owned street railway system, to charge a just compensation for the service rendered. If this is done it will develop new districts where the laboring classes can live under proper conditions.

It is the civic duty of the municipality to bring about the changes suggested, and the increase in taxable real and personal property values will afford an economic justification for a loan of municipal credit when needed to finance costs of extensions of local transportation systems. It is now generally recognized that without direct municipal aid it is almost impossible to plan extensions or to establish rapid transit lines such as elevated or sub-surface structures.

GUARANTEED RETURN ON INVESTMENTS ADVOCATED

Another more direct and substantial aid is that of a guaranteed return on invested capital. A proposed plan of this character differs from the aid designed by the federal government for interstate railways in that the proponents of the plan claim that the return on capital invested in local transportation systems should be paid by the municipality whether earned by the system or not. It is pointed out by the champions of this scheme that Massachusetts has adopted some laws which provide for aid of this character for local transportation lines, and that Wisconsin also, through the so-called Kenosha enabling act, has expressed willingness to extend aid which will accomplish similar results. Personally, it is difficult for me to imagine a state of affairs which would justify aid of this particular type. It seems to me to have most of the dangers of public ownership without any of the corresponding advantages, if such there be.

In my opinion, the best plan evolved so far is the service-at-cost franchise. Inherent in it, unfortunately, is the danger that there is not sufficient incentive to economy and to increased efficiency, since, irrespective of what conditions prevail, the public pays. Possibly some scheme like that used in the case of the Massachusetts gas companies may be developed, where, as the efficiency increases and the cost to the public becomes less, the corporation is permitted a larger percentage of earnings. Possibly the one element lacking under this plan would be the difficulty managements might encounter in the regulation of wages of employees. For this reason, is it not possible that there could be arranged some profit-sharing scheme by which the employees of the company would first of all be assured of a living wage, fluctuating with the cost of living, and then participate in the profits of the company in proportion as they assist in the reduction of the expenses of the service? Under such an arrangement we should probably find that the employees would become increasingly efficient and seek to obtain the greatest possible results with the smallest amount of power, at the same time attracting patronage to the lines by virtue of their politeness and courtesy.

Unfortunately, at present, there are still existing many causes which seem to make necessary public guarantee of returns on capital invested in public utilities. These reasons are:

1. Lack of stable returns.
2. Hazards of the business.
3. Capital does not flow freely into this business.
4. Needed improvements cannot be made.
5. City transportation systems may soon retard municipal and industrial growth.

MUNICIPAL OWNERSHIP

I have merely touched upon one aspect of the matter, namely, the need of a different attitude on the part of the public toward public transportation companies and the necessity for a change in the relationship between city governments and privately owned local transportation companies. There are many who prefer to have all public utilities owned by the cities themselves and there is no doubt that unless something decided is done soon this will be the result all over the country.

As to the undesirability of municipally owned public utilities, for the best arguments I refer again to the report of the Chamber of Commerce. Municipal ownership, wherever tried out, has proved uneconomical and unsatisfactory. Political considerations are almost bound to creep into questions of management, and inefficient people are kept on the payrolls because they control votes.

As far as the private investors are concerned municipal ownership is perhaps the best thing under present conditions that could happen to them. The United States Constitution forbids confiscation, and the cities, in taking over the transportation systems, would have to pay an adequate remuneration to the present holders of the stocks and bonds of such enterprises. This would probably be the easiest way out for them, but I wish to emphasize once more the necessity for all of us to take a broader view of the question, since the whole future development of our cities depends upon the proper treatment of the question, of which I have sought to state some of the principal aspects.

Public Opinion and Utility Problems*

The Public Utility Has Its Salvation in Its Own Hands—Adequate Service Must Be Furnished by the Electric Railways to Offset Adverse Public Opinion — When Accomplished, Commission Regulation Will Prevent Confiscation

BY HON. JAMES H. WILKERSON
Former Chairman Illinois Public Utilities Commission

HON. JAMES H. WILKERSON

THE problem of the public utilities, like every other business and economic problem of today, springs from the war. It has many difficult elements resulting from the nature of the business and the close relation which the service furnished bears to the daily life of the people. The frequency with which the people come in contact with these public utilities and the circumstances under which they come in contact with them give rise to perplexing factors in the problem, with the psychological scenery all set for the entrance of the demagogue.

My own view necessarily is that of an outsider, one whose duty it has been to endeavor to apply impartially the rules prescribed by law. An administrative board charged with the enforcement of laws does not possess arbitrary power. It should not act from whim or caprice or consider political expediency. It is subject to constitutional limitations and to statutes which created it. Whatever opinions its members may have individually, the board as such has no concern with the wisdom of the law under which it operates. Its duty is to enforce the law as it finds it, and, for the result, it is answerable to the courts only.

Experience has led me to the conclusion that the permanent and final solution of this problem involves something more than statutes, court decisions, orders of commissions, or ordinances of city councils. Constitutions and laws and decisions have no permanency unless back of them is the sentiment of the people. No question whose solution involves the enactment, interpretation and enforcement of laws can ever be finally settled until it is settled in the minds of the people and until the law reflects the true thought of the people.

SALVATION OF RAILWAYS IN THEIR OWN HANDS

I am satisfied that your fate is in your own hands, and that you must work out your own salvation by bringing your case home to the people. You must get back of you not merely laws, which may be amended or repealed, or orders, which may be modified or set aside, or court decisions, which give you nothing but bare legal rights, but also a public support and confidence which will restore your credit and insure a permanent and stable settlement of your difficulties.

If you fail in the task just ahead of you, of crystallizing a solid and permanent popular support for private ownership under state regulation, there can be no doubt that the next step will be the experiment of public ownership—an ownership which was recently averted in the case of the steam railroads by one of the most thorough campaigns of education ever carried on in this country.

Let us analyze briefly the problem. Here is a transportation enterprise with an invested capital of nearly five billion dollars. The steam railroads have been called the arteries of the nation's commerce. The electric railroads are just as close to the life of the great cities and industrial districts. The whole growth of the great cities is centered around them. They have given such an impetus to city development that it has been impossible for the transportation systems to keep pace with the growth of the cities.

Notwithstanding the development of other means of transportation, the use of the electric railways has been continually increasing. In New York City the average annual number of rides per capita is now 370 and in Illinois it is 114. This shows how intimate is the contact of this service with the daily life of the people.

The early period of electric railway history was like that of the steam railroads. There were overcapitalizations, corporate mismanagement, failure to provide for depreciation, payment of unearned dividends, overbuilding into unprofitable territory and stock manipulation for purposes of promotion and speculation.

In the case of urban lines, the right to occupy streets was under either limited or indeterminate franchises which contained provisions as to compensation to be paid for the use of the streets, as to sprinkling, paving and other requirements. Most of the franchises also provided for a uniform 5-cent fare. It seemed to be taken for granted that nothing would ever happen in this country which would make the 5-cent fare insufficient to take care of operation, provide a fair return and maintain the enterprise on a stable and prosperous basis.

With the electric railways, even before the war it was apparent that there must be a process of reorganization and readjustment. In fact, some of the electric railways had already gone through that process.

The history of our steam and electric railroads is in no respect different from that of every new enterprise in the history of the world. With every new invention the imagination is always at work capitalizing dreams which never come true. The evils attending the promotion and organization of new enterprises are all adjusted in the end. Overcapitalization and speculation in the beginning should not be a bar to fair treatment by the public when the enterprise has been once put on a solid basis.

Several years before the war, many states established supervision of service, and the police power was exercised to require reasonable fares. The purpose of these laws was to take the public utility question out of local politics and to prescribe a fixed rule by which values and returns should be determined, subject to final review by the courts.

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*Abstract of address at the annual dinner of the American Electric Railway Association, Chicago, Ill., Feb. 10, 1921.

When commission regulation was established, complaints were made in some cases that the fares fixed in the franchise ordinances were too high. In a few states there were constitutional or statutory provisions giving to cities the power to make such contracts for fares. In most of the states, however, the authority to make contracts for fares binding against the exercise of the regulatory power of the state was not conferred upon cities. It was soon established by decisions of the Supreme Court of the United States that, generally speaking, these 5-cent fare provisions could not be enforced by the companies if the state, in the proper exercise of its authority to fix just and reasonable rates, prescribed a lower rate of fare. These decisions were viewed with considerable alarm by those engaged in the street railway business, because they meant that the capitalization upon which a return could be allowed must be made to correspond with actual values.

In most cases, however, the commission did not attempt to change the fares which had been fixed in the ordinances. Then came the war.

No Immediate Relief from War Costs

The War Labor Board ordered increases in wages, and materials and supplies had to be purchased at prices fixed by the government. The government had taken control of the steam railroads and had advanced rates to cover increased operating costs. In dealing with the electric railways, the war power was exercised to increase operating costs, but the railways were left to the local authorities for an adjustment of fares to meet their increased necessities. To be sure, the War Labor Board gently suggested to the local authorities that it would be highly proper and very patriotic for them to give consideration to what the government had done under the war power with reference to wages, and to grant relief to the railways which would make provision for their increased necessities. These acts will always stand out as one of the great injustices of the war period. Certainly it would have been just as proper for the government to exercise its war power to give to the electric railways adequate rates of fare as it was to exercise that power in fixing the wages of their employees. The electric railways were just as necessary to the successful conduct of the war as were the steam railroads, the telephone and telegraph lines, the shipyards, and other industries over which the government took control. Without the electric railways, the work in the great centers of industry could not have been carried on.

The processes through which relief could be obtained from the local authorities were slow and uncertain. In states having no commission, or in which the jurisdiction of the commission was so limited that it could not grant relief there was confusion confounded. In Ohio, the cases of Columbus and Toledo are striking examples. In New York, the Court of Appeals held that the Legislature had not given to the Public Service Commission power to fix rates in cases where there was a contract between the city and the company for a rate. In New York City, as in Chicago, the worst elements of the press united with the worst elements in politics in a campaign of gross misrepresentation and in an attempt to make political capital out of an emergency resulting from war conditions.

State Commissions Assailed as Enforcing Law

In states having commissions with authority to act, the appeals for relief were made to those bodies. The situation in Illinois is illustrative. These appeals were in many cases bitterly contested by the municipal authorities. It was urged that notwithstanding the action of the federal authorities as to wages, and the great increase in operating expenses due to the general advance in prices of commodities, the applications of the street railways for relief should be denied because of the provisions in the franchises fixing fares.

This attitude toward advances in street car fares is one of the strangest and most incomprehensible things which happened during the war. The 5-cent fare had become impossible due to the increases in wages and the prices of all commodities. Yet it was contended that the street car companies must continue to operate on a 5-cent fare, when that rate of fare would not produce enough to pay actual operating expenses, to say nothing whatever of any return upon the capital invested in the property.

Not only that, but in Illinois this contract question had been definitely settled long before the public utilities law was passed. The question had been before the Supreme Court of the State in three cases and had gone to the Supreme Court of the United States. It was settled in Illinois at the time the public utilities law went into effect that statutes such as those under which the city exercised authority over the local transportation systems did not confer upon the city power to make a contract for a rate valid against the exercise of the police power of the State, and it made no difference whether the subsequent exercise of the rate fixing power was by the Legislature itself or by the city under its delegated power to fix rates.

Shortly after the public utilities law went into effect, the question was raised with reference to service provisions in the Chicago ordinances. Our Supreme Court held that these were matters as to which the city was without authority to contract away the police power of the State, and that ruling was upheld by the Supreme Court of the United States. In other cases, involving contracts between street railway companies and cities for rates of fare, the Supreme Court reaffirmed the rule which had been laid down in the cases decided before the passage of the public utilities law.

It is settled, as definitely as any question was ever settled in the courts, that these contract provisions were inserted in the ordinances without authority of law, and that when the public utilities law became effective all rates were subject to the rule that they must be just and reasonable.

The commission had no discretion in the matter. It was its duty to comply with the requirement of the statute and to determine what rates were just and reasonable. Yet, notwithstanding the clear necessity for prompt relief, in spite of the definite rulings of the Supreme Court there were assaults in many cases upon the commission for enforcing the law, and the companies were denounced as contract breakers.

Temporary Rate Bases Established

Another question confronting the commissions was that of the granting emergency relief without complete valuations for rate-making purposes. In most states it was held that the commissions did have this authority. A ruling to the contrary would have meant ruin to these utilities. Valuation proceedings are long and tedious affairs. In granting emergency relief, the rule was followed that a rate would be fixed which was sufficient to take care of operating expenses and depreciation and in addition to give a return upon the lowest valuation which it was reasonably possible to place upon the property.

Some measure of relief was thus afforded through temporary orders. The commissions, having granted temporary relief, proceeded to determine the valuations for rate-fixing purposes. The principles to be followed in making these valuations, generally speaking, thus far have not been very definitely established. The point of uncertainty is the extent of the consideration which is to be given to war prices. The valuations which have been made by the Illinois Commission follow the decision of our Supreme Court in the Springfield gas case.

This, briefly, is what the commissions did in granting relief to the electric railways. What would have been the result if the commissions had yielded to the clamor of agitators and had failed to act in this emergency? The utilities would have had the right to resort to the federal courts for protection of their property against confiscation. And, in giving this protection, the federal courts would have fixed the rates to be charged. There would have been a complete abdication of their authority by the states.

COMMISSIONS MAKE CORRECT DIAGNOSIS

The commissions have been absolutely right in what they have done in granting this relief. I make this prediction with reference to the cases in Illinois, particularly in Chicago. These cases are now in the courts. If the representatives of the city, who have taken these appeals have the courage to follow them up, the orders of the commission will be sustained. If the commission in this state, in the face of the constitution and the statutes, undertakes to impose upon these utilities confiscatory rates, their orders will be stopped in the federal court.

These assaults upon the commission are in their last analysis assaults on the constitution and the courts, because the commission, in making its decisions, has followed the constitution and the rules which have been prescribed by the courts.

It would not have been believed five years ago that such an attack upon constitutional rights would have been tolerated in the State of Illinois. Of one thing we may be sure. This is not Russia. This is not Germany. This is the United States of America, and the courts and the army of the nation will stand, if the necessity arises, against confiscation of property.

There is one incident in the history of this State. This State once abdicated the functions of government and refused to enforce the law and to protect property rights. President Cleveland put the entire force of the nation behind the orders of the federal court. I do not believe that this will be done again in Illinois, but, if any agency of the State fails in the performance of its duty to protect the rights of our citizens, you may rest assured that the federal courts and the federal government will not fail to act.

The relief which the commissions granted was, generally speaking, inadequate. This was necessarily so because of the rule required to be followed in granting emergency relief, and, as I have pointed out, final valuations could not have been made without hearings which would have taken a great deal of time.

On Dec. 31, 1920, there were, in the United States, in the hands of receivers ninety-one companies with 5,330 miles of track, representing about 11 per cent of the total street railway mileage of the United States. This was in addition to the lines foreclosed, reorganized or wholly abandoned.

The average advances which have been allowed by local authorities to the electric railways have not been as great as those which the steam railroads have received through the more efficient agency of the federal government.

HOW THE SITUATION STANDS

Let us take an inventory of the situation. From a strictly legal standpoint, it is satisfactory in most of the states. The commissions are acting under laws which entitle the utilities to just and reasonable rates. Commissions must follow this rule and must recognize constitutional rights. Even if the public utilities laws are repealed, the old contract ordinances will not be revived. They went down when the public utilities laws went into effect. They were superseded by the general rule which the legislatures prescribed for the fixing of rates. If the rate-making power is returned to the municipalities, their ordinances will be subject to constitutional requirements, and if those ordinances are confiscatory, relief will be afforded in the federal courts, just the same as against confiscatory orders of commissions.

The principles which are required to be followed in making valuations are becoming settled. While there is still some uncertainty, doubts are gradually being removed. Courts almost without exception are laying down the rule that commissions, in making their valuations, must give substantial consideration to present-day prices. This insures valuations which will make possible the financing required for needed improvements and extensions.

As to the rate of return, the state and federal courts are recognizing that it requires a higher rate to stand the test against confiscation than it did before the war. But it is not sufficient merely to save the properties from confiscation. It is not sufficient even to get a permanent valuation based upon sound principles and a rate of return required by present economic and financial conditions. If these utilities are to continue to function, they must provide service, and to furnish service, they must have improvements and extensions. This requires money, and money requires credit. Credit cannot be obtained if it is necessary to be continually running to the federal court to save the property from being confiscated. Credit cannot be obtained if public utility commissions are appointed to deliver decisions which have been promised in a political campaign. In fact, the credit of these utilities will never be established until this subject is taken out of politics, until commissions are permitted to function like courts. And this will not be accomplished until there is an enlightened public opinion based upon an appreciation of the facts which will compel agitators and politicians to let this subject alone.

I know that in some sections of the country and in some communities there is a realization on the part of the people of the importance of this subject, and of the principles which should be applied in dealing with it. But, in general, the situation is a great deal like the free silver agitation prior to 1896, or the steam railroad problem before the campaign of education by which the people were made to realize the necessities of the railroads.

What is the reason for this agitation? Whatever it is, the situation is in your hands. You must counteract it by doing everything within your power to render satisfactory service. I know the circle around which you are traveling. There is poor service because there is no money, and there is no money because there is no credit, and there is no credit because of the antagonism of the people, and the antagonism of the people results from poor service.

RENDER THE BEST SERVICE POSSIBLE

The only way you can break through this circle is to convince the public that you are doing everything within your power to render the best service possible under existing conditions. And if you do make an honest effort, and are let alone by the politicians and the newspapers, you can accomplish this.

The chief causes, however, of this unfair agitation are dishonest politics and the dishonest press. In politics we shall always have those who are willing to capitalize every issue or any element. We have those in this country who have catered to disloyalty and treason. And to make capital out of the utility question is for some politicians a very trifling affair and one which in no way shocks the conscience.

The dishonest press is another thing. No one in this country questions the basic right of the freedom of speech and of the press. A newspaper has a perfect right to advocate any cause which it may think is right. It may advocate public ownership. It may support socialism. But it is false to the principles of true journalism, and betrays the confidence of the public, when it publishes what it knows is not the truth.

Take the case right here in Chicago. In spite of the established law and decisions of the highest courts of the state and of the nation, day after day the street car companies have been denounced as contract breakers, and the commission has been assailed as being party to the destruction of sacred contract rights. And yet, in all this denunciation, there has not been a correct statement of what the law really is or what the courts have actually held.

Another favorite falsehood is that exorbitant returns are being permitted on watered stock. The truth is that in fixing the temporary rates which were allowed during the war period, the very lowest valuation which could be placed upon the property was taken as the rate base. The truth is that the advances which were allowed to the street car companies have been much less proportionally than the advances which were allowed in railroad rates by the federal government.

It is all right to carry on a campaign for municipal ownership, but to work up a popular clamor by a false appeal under disturbed conditions following the war is intolerable.

TELL THE PEOPLE THE FACTS

This can be met only by a campaign of education. And you must realize that you are all interested in the general problem. Even if your own communities are all right, your credit depends upon the general credit of this class of utilities. It is a case of all for one and one for all. You must make the financial world understand that this is a matter of much importance to the financial stability of the country.

You must organize and you must fight. I know that some good work has been done, but I know that you will pardon me when I say that my observation has been that it has not been carried on with the zeal that the righteousness of the cause requires.

It is a cause which requires aggressive work and vigorous speech. There is a need for straightforward and emphatic expression. There is nothing to apologize about. It is better to say nothing than to make half-hearted and evasive and apologetic appeals. This is no place for the man who is afraid that he will hurt somebody's feelings. You must reach the people.

If the utilities of this country do not unite to make this kind of a campaign, if the solid business interests do not get back of you in this kind of a campaign, one for all and all for one, you will fail to establish your credit, and if you fail to establish your credit, it will mean financial panic, general pandemonium and ultimately public ownership.

Make no mistake. The courts cannot save you. They can keep the agitators from tearing up your tracks and from confiscating your property, but they cannot give you credit. Commissions cannot save you. An order is of little value which does not have permanency. Permanency requires a public sentiment which will insure the right kind of a commission and which will let the commission know that it has the support of the people in what it is doing. If you get the people back of you, if you can convince them that you have been right and are right, and that the commissions have been right and are right, they will take care of the politicians and the dishonest newspapers.

THE PEOPLE WILL BE REASONABLE WHEN THEY KNOW THE FACTS

You may say that this will be a hard task, but it is made the easier, because the American people on questions involving protection of property and financial integrity are fundamentally right. The reign of the demagogue in America has always been short. We had our great critical period when the agitators were railing against the centralized national government with the power to protect property. It was followed by the constitution. After the Supreme Court had been established and John Marshall was writing his great opinions which made this a real nation, the agitators clamored for a time for the abolition of the court, but the court and the nation still exist. In the great battle for sound money America served notice to the world that repudiation and confiscation are not in her vocabulary. And in dealing with this great utility problem you will find that the people will be sound and honest when they know the facts. There will be no destruction of property right. There will be no confiscation. The courts will do their duty and the commissions will do theirs.

I have faith in human nature, and I do not believe that in the United States there will be found a commission whose members, having taken the oath of office to support the constitution of the state and of the nation, will deliberately and willfully set about to destroy rights protected by the constitution.

The great industrial and economic structure of America, of which you are a part, is sound. The rain may descend and the floods may come and beat upon it, but it will stand, for it is founded on a rock.

Association Holds Midyear Meeting

Many Plans of Electric Railway Finance Discussed in Specially Prepared Papers—Favorable Action Taken on Report of the Federal Electric Railways Commission and the Referendum of the Chamber of Commerce of the United States

PHILIP H. GADSDEN

THE tenth annual midyear meeting and dinner of the American Electric Railway Association was held at the Drake Hotel, Chicago, Ill., on Feb. 10. It was preceded by a meeting of the executive committee, held at 9:30 a.m. on the same day. Condensed minutes of this meeting are given elsewhere in the present issue. President P. H. Gadsen presided at all sessions of the conference, as well as at the banquet. More than 400 delegates registered for the conference and between seven and eight hundred attended the dinner.

Morning Session

The meeting was called to order at 10:30 o'clock by President Gadsden. He was presented with an "Emblem of Authority," which was the handiwork of his shop employees at Charleston. He used this emblem, a gavel, throughout the meeting.

The report of the committee on constitution and by-laws was presented by Charles L. Henry, in the absence of Chairman L. S. Storrs. The report recommended that the by-laws be amended to agree with the suggestion made by J. H. Pardee in his presidential address at the 1920 convention, namely, that the executive committee be enlarged by the addition of six members elected at large, each to serve for a term of one year and to be ineligible for re-election for one year from the date of expiration of his term of office. The proposed changes in the by-laws were submitted to the membership in advance of the Chicago meeting in accordance with the provisions of the constitution. Amendments to the two paragraphs of the by-laws affected by these changes were adopted. The paragraphs as amended read as follows:

> VI. (a) The entire charge and management of the affairs of the association shall be vested in an executive committee, which committee shall consist of the president, vice-presidents, presidents of affiliated associations, five others who shall be connected with member companies engaged in the business of manufacturing or selling materials for electric railways and six members at large. The past-presidents of the American Electric Railway Association and its predecessors, the American Street and Interurban Railway Association and the American Street Railway Association, shall be honorary members of the executive committee, but without the power to vote.
>
> (b) The five members of the executive committee representing manufacturer member companies and the six members at large shall be elected to serve for a term of one year and shall not be eligible for re-election for a period of one year from the date of the expiration of their respective terms of office. All such elections shall be made by ballot and a majority of the votes of the company members present shall be necessary to an election.

The symposium of papers on electric railway finance was then taken up. Abstracts of these are grouped together as the leading feature of this issue of this paper. An introduction by J. D. Mortimer was read by title.

The first formal paper on the program was on "Previous Methods of Electric Railway Finance," by James F. Fogarty, secretary the North American Company, New York. In the absence of Mr. Fogarty the paper was read by Harold V. Bozell, ELECTRIC RAILWAY JOURNAL. This and the other finance papers are abstracted elsewhere in this issue.

The subject of present requirements for mortgage securities was discussed by F. K. Shrader, of the firm of Halsey, Stuart & Company, Chicago.

S. B. Way, vice-president and general manager of the Milwaukee Electric Railway & Light Company, then presented a paper on home-town financing.

MR. COREY ELABORATES HIS PAPER

The next paper was on the necessity of financing by sale of capital shares, by Chester Corey, vice-president Harris Trust & Savings Bank, Chicago. In addition to the remarks abstracted under the symposium, he said that while prophecies were unsafe it was not improbable that in less than five years the well-established street railways would find a good market for their stocks and bonds.

Mr. Corey also discussed briefly the question of valuation in relation to rates, and said that there were many defenders of the idea that the rates established in 1921 should be based upon current price valuations and that past averages need not be considered. Personally he did not agree with this idea unless adjustments in valuation were made from time to time as current prices varied. The rate of return would also naturally change at intervals depending on the cost of money resulting from the obligations of foreign governments and municipalities being floated here on an 8 per cent basis. For this reason home securities could only be issued at comparable rates.

Melvin A. Traylor, president First Trust & Savings Bank, Chicago, discussed the subject of municipal aid in electric railway financing. In addition to the remarks that were given in the abstract elsewhere in this issue, he said that a forceful answer to the present condition of railway securities was found in the fact that for the two-year period Jan. 1, 1919, to Dec. 31, 1920, fifty-nine issues had defaulted in the payment of their interest charges. These defaults, which occurred in twenty states, amounted to a par value of $413,000,000, with annual interest accounts of $23,000,000. This condition, he said, presented a serious problem not only for the bankers, who have distributed these securities, but for the companies involved. The aid to be given by the public, he said, should be through better sentiment and more honest public interest.

There was no discussion of the finance papers.

Afternoon Session

At the afternoon meeting, called to order by President Gadsden, Walter A. Draper as chairman presented the report of the committee on the report of the Federal Electric Railways Commission and the report of the special committee on public utilities of the Chamber of Commerce of the United States of America. In presenting the report and recommendations of this committee Mr. Draper told at some length the consideration and detail study which had been given the matter, first by his committee and later by the executive committee of the association when it was brought before the latter. He read the names of the men present at these several committee meetings and informed the convention that the reports had been unanimously approved by the executive committee. Thereupon he moved the adoption of the resolution approving the reports. No discussion developed when President Gadsden placed the matter before the convention and the report was adopted without opposition.

The text of the resolutions as presented by Mr. Draper and adopted by the conference is given in full at the bottom of this page.

C. L. Henry then read a telegram from Thomas N. McCarter which suggested that the association pass a resolution urging that the House of Representatives decline to pass the bill now pending before it which would create a new 2-cent coin, for the reason that such a coin would result in serious financial loss to the electric railways. Particularly on more than 200 properties using the registering type fare boxes it would entail other difficulties in the collection of fares and in the handling of turn-ins in the counting machines and also delay service.

Mr. Henry introduced a resolution embodying these points and it was passed by the meeting. President Gadsden then made a few remarks emphasizing the great desirability of having more discussion at the association meetings and served notice on the members that he was going to do all in his power to see that there is a real debate on the principal issues of the industry at the next annual meeting. He then declared the meeting adjourned.

The Dinner

The closing function of the midyear meeting was the annual dinner, which was served at 7 p.m. at the Drake Hotel. Philip H. Gadsden, president of the American Association, presided. The arrangements for the dinner were in charge of a committee of fifty, of which L. E. Gould, Chicago, Ill., was chairman, and E. B. Burritt, secretary of the association, was secretary.

The after-dinner speakers were Hon. John W. Weeks, former United States Senator from Massachusetts; Hon. James H. Wilkerson, former chairman Public Utilities Commission of Illinois, and Charles A. Leedy of the Youngstown (Ohio) *Telegram*, widely known as a humorous writer and speaker and a member of the board of directors of the American Press Humorists.

Before introducing the speakers of the evening, Toastmaster Gadsden reviewed the present status of the

Resolutions

on Federal Commission and Chamber of Commerce Reports

Whereas, during the last twelve months the Federal Electric Railways Commission, a thoroughly representative body appointed by the President of the United States, and the committee on public utilities of the Chamber of Commerce of the United States have reported the results of exhaustive studies of the electric railway industry, and

Whereas, subsequently the report of the committee on public utilities of the Chamber of Commerce of the United States was submitted to referendum and has been approved by an almost unanimous vote of the membership of the Chamber, representing the opinion of the country's organized business, and

Whereas, no other industry in the country has had the benefit of such complete inquiries into its affairs made on the part of the public, and

Whereas, the fact that such inquiries have been made by two such representative bodies is the highest evidence of the critical situation into which the electric railways of the country had fallen, and

Whereas, while differing somewhat in detail, the two reports agree on the main facts which have contributed to the present situation, and they unite in pointing out the importance of restoration of the credit of the electric railways and in recommending certain broad underlying principles to restore this credit and insure the high class of service which the public requires.

In view of these facts and that the public may know the attitude of the electric railway industry, itself, with regard to these reports and their recommendations, it is hereby

Resolved, by the American Electric Railway Association, in annual midyear conference assembled at Chicago, Ill., that this association does hereby recognize the analyses made by the Federal Electric Railways Commission and by the special committee of the Chamber of Commerce of the United States as being fair and sound statements of the conditions surrounding the electric railway industry today. And it is hereby further

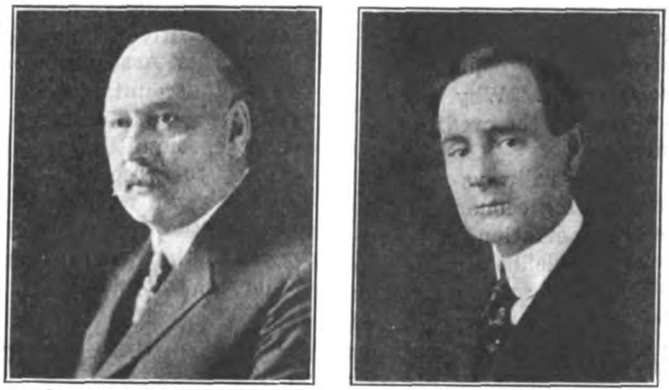
Resolved, that the conclusions and recommendations of these reports with reference to steps which should be taken by both railways and public to rehabilitate electric railway service and credit, for the common benefit of all, are bases upon which the electric railways should join with the public in efforts to meet local conditions. And it is hereby further

Resolved, that the electric railway industry, realizing that the public comfort and convenience as well as the growth and prosperity of communities and of individual business enterprises are largely dependent on electric railway service, hereby places itself on record as ready to do everything in its power to render the most complete service to its patrons, on the lowest possible profitable fare basis consistent with fairness in its wages and working conditions to its three hundred thousand employees, and relies on the public to allow a fair return for service rendered and to establish electric railways on a sound financial basis, which is essential to the general program as outlined by these reports.

electric railway situation and took an optimistic view of what lies in store in the future. A summary of his remarks follows:

OPTIMISTIC VIEW OF THE FUTURE

After outlining the subjects that had been discussed at previous association meetings during the past four years Mr. Gadsden said that we have at last unquestionably passed the peak of high prices both of labor and material. While there has been no appreciable effect as yet upon the operating costs of electric railways growing out of the decrease in the cost of materials, still it is a fact that we are no longer called upon to face increases in the cost of materials or demands for further increases in wage scales. For the first time in four years these questions are not uppermost in our minds and are not insistently demanding our undivided attention. Also for the first time in that period we are enabled to catch our breath and to look around and appraise the damage which has been done; to take account of stock; to marshal the remaining assets and form some intelligent and comprehensive idea of the condition of the industry as a whole. We have all the sensations of victors of a great war. We are survivors of the greatest economic upheaval which this country has ever known. Wages have increased almost 100 per cent. Every class of material entering into the construction and maintenance of electric railways has advanced 150 per cent. With some notable exceptions, the electric railways as a class have succeeded, after desperate effort, in increasing their rates of fare from 20 to 100 per cent. With the exception of those companies which still for one reason or another are compelled to operate under the old 5-cent fare the rates now range from 6 to 10 cents. The average rate of fare throughout the industry is 7.09 cents, or an increase of 40 per cent.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HON. J. W. WEEKS CHARLES A. LEEDY

Two of the After-Dinner Speakers

On account of the great proportion which labor bears to the total cost of operation the electric railways have suffered most from the great increase in the wage scale. On account of the obsession on the part of the public over the fixed 5-cent fare the electric railways were the last of any of the public utilities to obtain relief by way of increased fares, and the relief granted was at no time sufficient to offset the increases in the cost of labor and materials which had already been incurred. Instead of being able to put into effect rates which would anticipate the continuing increases in the cost of labor and materials which were obvious to every one, the electric railway industry was compelled to stand the brunt of such increases for months before any relief by way of increased fare could be obtained. We have literally fought our way from a 5-cent fare to a 10-cent fare, every step of the road being fiercely contested.

Notwithstanding an increase in wages of almost 100 per cent and the grossly excessive prices of practically all materials, notwithstanding the unreasonable delays in securing increases in fares, the electric railways during the period of the war and reconstruction have continued to "carry on"; they have continued to render an essential service in a most efficient way. They have carried countless thousands of workmen, whose daily wages had increased from 75 to 150 per cent and in some cases 200 per cent, to work in factories and industrial undertakings of every nature whose profits exceeded in most cases anything ever experienced in business before, while the electric railways were themselves compelled to fight desperately for any relief from conditions which, while threatening their destruction, were rolling up enormous profits to business generally throughout the country.

Notwithstanding the excessive burdens placed upon them by the increased wages and cost of material, notwithstanding the ruinous delay in granting of increased fares, notwithstanding the burdensome paving taxes and excessive taxes of various kinds imposed upon electric railways, in 1920 only sixteen companies out of a total of 943, having a mileage of 992 out of a total mileage of 44,835, with securities of $94,174,230 out of total securities of $4,889,962,096, were forced into the hands of receivers, and the service kept right on. It is true that in order to perform this necessary service to the public, in order to live up to the high standard of service which the industry had established, it was necessary in most cases for companies to pass the dividends on their stocks, but the point is, before sacrificing the service or inconveniencing the traveling public by discontinuing service on unproductive lines, the stockholders of electric railways, and in many cases the bondholders, paid the price, a price which stockholders in no business outside of those regulated by law were called upon to make.

RAILWAYS OPERATED UNDER MOST SEVERE CONDITIONS

Is there any other business or industry which could have survived such treatment? The electric railways have been forced to operate under the worst possible conditions conceivable. The industry as an industry has been manhandled both by friend and foe. It has been ruthlessly exploited. The public has insisted upon its right to a nickel fare long after the value of that nickel had shrunk to 2½ cents. The concentration of population in cities during the war laid enormous additional burdens in the way of increased service upon the electric railways of the country.

And yet today the electric railways are carrying more passengers than ever in their history. That is to say, we are performing a greater service to the public than ever before. We have come out of this great economic encounter strong, efficient, courageous. Was there ever such an instance of inherent strength and stability in an industry? What greater evidence of essential and permanent values can be found as a basis for investment? Everything conceivable has happened to the electric railways, and yet they have survived.

Contrast this with the business world today. After four years of unexampled prosperity, at the first breath of adverse conditions, textile mills, shoe factories, automobile manufactories, steel mills, lumber mills, etc., first reduce working hours, then shut down, throwing hundreds of thousands out of work. Notwithstanding all that has happened to the electric railways, out of two million and more men reported unemployed in the United States today not one is an employee of an electric railway.

The electric railways have no large inventories to be marked down in the face of falling prices. When the whole business world is complaining of poor business, our facilities are taxed to their utmost capacity. From a standpoint of security of the investment, can there be any question that electric railways possess all the elements of a sound and stable investment?

And yet, with all of these elements of stable and essential value, the Federal Electric Railways Commission found officially that the electric railway industry as it now exists is without financial credit. Why is this? What further must be done to restore the credit of the electric railways of this country?

The answer is, fares of electric railways must be flexible, quickly responsive to changing economic conditions. The price charged for transportation on electric railways must bear some proper and definite relation to the character and quantity of the service rendered. Our system of electric railway regulation must be so amended as to provide a method as near automatic as possible whereby fares shall go up or come down with changes in operating conditions. With the revenues of electric railways adjusted so as to cover the cost of operation and provide an adequate return upon investment at all times the credit of electric railways, provided we have the proper financial structures, will rank next to municipal securities.

Already we are beginning to feel the effect of changed conditions. Every reduction in the price of coal, or rails, or crossties, every cut in the wage scale from now on, is going to show itself at once in our operating statements. We have weathered the storm. We have turned the corner. We are on the up grade. Even with present fares it is going to take considerable time to overcome the operating losses of the past four years and overtake the large deferred maintenance on all of our properties. But with steadily declining cost of material and labor, which we can reasonably look forward to, and constant if not increasing traffic, we can see the way out.

So out of the stress and strain of war and reconstruction the electric railways emerge from this dreadful period, having had burned into them the lesson of strict economy, and purged, I hope, of some, at least, of their misconceptions of the part which the public is entitled to play in the conduct of their business; keenly appreciative at least of the public good will and of the public viewpoint; spiritually chastened by their bitter experience, but, nevertheless, strong, self-reliant, proud of their wonderful achievements under most adverse conditions, and, lastly, full of courage to undertake the greater task which the future holds in store for them.

The address of Mr. Wilkerson is abstracted elsewhere in this issue. An abstract of that of Ex-Senator Weeks will be given in a later issue.

Approximately one hundred ladies were guests of the association and after the close of the banquet there was dancing until midnight.

Results of Committee Meetings Held During the Convention

THE special committee on the reports of Federal Electric Railways Commission and the Chamber of Commerce committee completed a draft of a resolution to recommend to the association for adoption.

The committee on company membership decided to follow a program of activity similar to that followed last year. The committee will ask present company members to work actively for new members, and will request all members to make greater use of the company membership emblem. The manufacturing members will be urged to use it on all advertising copy. The next meeting will be held in Pittsburgh, Pa., on April 8.

The committee on mail pay decided to recommend that it be authorized to continue its efforts for further increase in mail-pay rates.

The executive committee decided to authorize the Accountants' Association committee on standard classification of accounts to co-operate with the depreciation section of the Interstate Commerce Commission. The executive committee also authorized the committee on mail pay to proceed as recommended in its report. It also received a report from the publicity committee and approved the report of the special committee on the reports of the Federal Commission and the Chamber of Commerce committee.

Fritz Medal for Sir Robert Hadfield

THE John Fritz Medal Board, representing five leading American engineering societies, has awarded a gold medal for notable scientific and industrial achievement, especially in the invention of manganese steel, to Sir Robert Hadfield. This material was first described by him in 1893, but it did not become generally known until its qualities in the making of armament were realized. Manganese steel has proved of great use in the electric railway industry, especially in track construction, where the importance of wearing qualities predominates.

Among the men who have been awarded the Fritz medal previously are Thomas A. Edison, Gen. George W. Goethals, George Westinghouse, Orville Wright and Alexander Graham Bell.

Dr. Pupin Wins Edison Medal

AT THE midwinter convention of the American Institute of Electrical Engineers, to be held in New York City, Feb. 16-18, the Edison medal, bestowed annually on the scientist who has done most notable work in electrical engineering, will be awarded to Dr. Michael Idvorsky Pupin, professor of electro-mechanics at Columbia University. Not only is Prof. Pupin an eminent physicist, but he has been a leading figure in Serbian-American affairs and is now honorary consul-general in New York for the Serbian government. He was born at Idvor, Banat, Hungary, on Oct. 4, 1858, but has spent his entire professional career at Columbia.

At the annual meeting of the board of trustees of the United Engineering Society Jan. 27 the following persons were elected officers of the society for the ensuing year: President, J. Vipond Davies; first vice-president, Calvert Townley; second vice-president, W. L. Saunders; secretary, Alfred D. Flinn; treasurer, Joseph Struthers; assistant treasurer, George H. Pegram.

This Is the Third of a Series of Articles on the Report of the Federal Electric Railways Commission, Written by a Commissioner

Service-at-Cost Means Co-operation

Electric Railway Labor Has Opportunity Under Service-at-Cost to Co-operate and Benefit from Results of Efficient Operation—Co-operation Between Public, Owners, Managers, Supervisors and Working Forces Is a Certain Result of the Adoption of This Plan — Stabilization of Financial Condition Is Another Result — Jitneys and Motor Buses Cannot Solve the Problem Alone

By W. D. MAHON
President Amalgamated Association of Street & Electric Railway Employees of America
Member of Federal Electric Railways Commission

W. D. MAHON

A CAREFUL analysis of the report and recommendation of the Federal Electric Railways Commission would seem to lead to the conviction that the commission has placed before the public and street railway companies the logical immediate solution of the problem of municipal, urban and interurban transportation.

The Federal Electric Railways Commission, appointed May 31, 1919, by the President of the United States, had presented to it, as its report shows, the electric railway industry as it now exists at a time when it is without financial credit and is not properly performing its public function. A very exhaustive investigation was made and the solution of the problem may be well quoted in the language of the commission, wherein it says:

> We strongly recommend the principles of the service-at-cost contract, not as the only solution, but as one means of solving a very difficult problem.

I may add to this that my judgment, formed after years of experience and observation in the business, leads me to believe that it is the best solution.

Most important to the common good of all parties interested in street railway transportation is that the method of the commission would impel active and studious co-operation on the part of the public, the owners and the operators. In the mention of operators I mean the managerial, supervisory and working forces who immediately direct and operate the business or, in other words, run the cars.

This active and studious co-operation of the public, the owners and the operators cannot fail under the method advanced by the commission. It cannot fail because of the fact that it at once establishes co-operative responsibility, which is not recognized under the present private ownership and operation. The commission's plan places such co-operative responsibility in a light beyond possible denial and commands immediate active co-operative participation.

CONDITIONS OF EARLY FRANCHISES

Under the present system we may regard the owners—stock and bond holders—as interested principally in obtaining a return upon their investment. Such a return may be operative, or that obtained from the profits of operation, or it may be speculative. There is no disposition on the part of the owners to limit the return. There is a natural ambition to make the property unduly accumulative. Certainly we cannot charge the public with having consciously or actively co-operated to make the street railway properties a success in this line. Yet the speculative aspects of the situation have actually brought the public, face about, to confront the problem as it is today—a result of the public's indifferent tolerance.

Franchises were granted to early promoters under terms and conditions that were made in order to present inviting investments and speculative securities. The franchises were so constructed as to cause the patron element of communities to believe that its interest ended with each ride at the stipulated rate of fare. The tax-paying element sensed in those franchises a lightening of the burden of taxation that was transferred into a liability of the street railway properties, such as paving and other items to which the report of the commission calls attention.

These franchises granted twenty-five, thirty and thirty-five years ago by direct negotiation between the properties and municipalities were made on the basis of the going cost when a 5-cent fare may have been and presumably was an even too liberal concession to the properties; but those contracts, if we may call the franchises contracts, were made upon the basis of the then labor and material prices, which were, approximately, less than one-third of the cost of construction, equipment and operation under present prices. They were made on the basis of the going costs of operation. From that time there has been a progressive increase in the costs of construction, labor, equipment, etc.

Managements of the properties, to render creditable account to the stock and bond holders, were compelled to meet these ever-increasing burdens by passing them along to the wage-earning element of the employees of the property in the way of low wages and undesirable conditions of employment, and to the patrons in the way of inadequate service. When the World War broke out these properties were paying the lowest of wages, were working employees under most embarrassing conditions of exactment and were rendering the least possible service to the public. Also, equipment and roadways were being neglected. The properties couldn't respond fully to the requirements. Bonding possibility had reached its limit.

CO-OPERATION DIFFICULT IN SUCH CIRCUMSTANCES

Certainly there had been cultivated no spirit of co-operation. The properties held out no inducement or attraction to labor. The type of service exacted the contempt of patrons. The results of operation were no longer a credit inducement. How could there be co-operation? It did not exist. The two elements that naturally will be led into co-operative responsibility with the property through the service-at-cost plan were rebelling, and perhaps they had some occasion to rebel. It is certainly conceded that labor may not be comfortably employed in a business that is losing money. We must admit that only that transportation can be afforded patrons which comes within the limit of receipts. In other words, no greater service will be long supplied than that for which patrons pay. How can there be co-operation under such a condition?

Jitney competition, which added greater burdens, rode in on the popular condemnation of street railway properties.

ESSENTIAL TO COMMERCIAL LIFE

Can any one dispute that street railway service is a necessary public utility? Not only is it necessary to life and health in relieving congestion by making it convenient for people to live in rural and urban communities, but it is essential to the commercial life of a large city. It is necessary to our large manufacturers and to the armies of workingmen employed by them.

We all know what an interruption of that service means in the business and social world. Perhaps I am specially competent to know that there is as yet no substitute for the modern street railway. Jitneys, at the most, can be only a makeshift and a very inadequate means of transportation. Modern business cannot continue if dependent upon jitney service alone.

I think the intelligent public will agree with me that it requires a perplexing, distressing wage and employment condition for employees to discredit the directorate or management of one of these properties to a degree warranting them to suspend work or go on strike. And in practically every instance the public declares for the employees and takes sides against the company. Does not this show absence of the spirit of co-operation? Does it not show absence of any co-operative incentive except that which is displayed by the public and employees?

Under the plan recommended by the federal commission the strike method of adjusting differences is abandoned by the substitution of the collective agreement with equitable arbitration enforced by the co-operative spirit. From the fact that capital's return is fixed and labor, organized, stands as an important element of the co-operative management and operation, the lockout is abandoned. This is an added insurance of uninterrupted service. I have every reason to believe that the respect accorded the rights of labor as incorporated in the commission's service-at-cost plan would eliminate the strike and the lockout and enlist the hearty co-operation of employees in effecting and perpetuating an economic service. Employees would recognize their responsibility to co-operate in eliminating waste, preserving property, keeping the rate of fare at a minimum and rendering at all time an efficient and convenient service.

SERVICE AT COST DOES NOT AFFECT MUNICIPAL OWNERSHIP

The commission very clearly enlightens the public and the railway companies upon the fact that the service-at-cost plan not only does not stand in the way of municipal ownership, but so interests the public by actual participation in the management and the operation under the service-at-cost plan that it is better qualified to determine upon the subject of municipal ownership at any future time when the communities interested are prepared to undertake municipal ownership. In the meantime, the municipalities may find themselves operating under a more acceptable arrangement than could be had under municipal ownership and operation.

Under municipal ownership, the municipality assumes the roll of private ownership and operation, with an ever-changing directorate resulting therefrom in political antagonisms not at all of benefit. On the other hand the service-at-cost plan retains the property under expert management with a skilled operating organization in which the public co-operates by means of a supervisory commission or commissioner—all working to the one ideal, an efficient service at the least possible rate of fare.

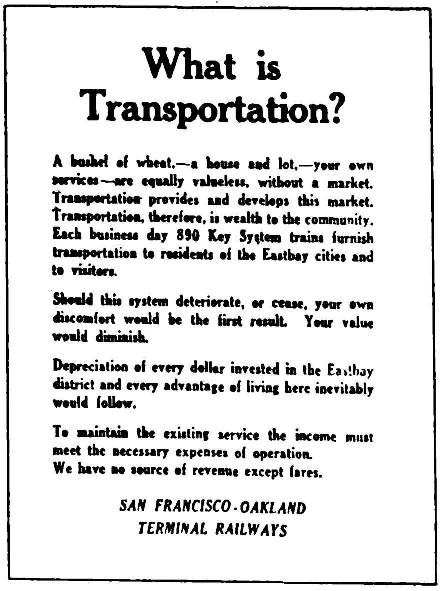
WIDER DISTRIBUTION OF REPORT DESIRABLE

There is much that can be written and said in support of the federal commission's report that would be highly enlightening upon this all-important subject. I believe the government could do a wonderful service by placing copies of the commission's report in the various homes in our large cities. May there be some means of obtaining such publicity.

If this were done, I believe it would lead to the early adoption of the commission's recommendation by various municipalities.

Transportation Essentiality Demonstrated

THE accompanying advertisement, prepared recently by the San Francisco-Oakland Terminal Railways, Oakland, Cal., is a straightforward plea for logical consideration of the fare question. It is the kind of publicity material that is calculated to set the minds of the railway's patrons to work.



What is Transportation?

A bushel of wheat,—a house and lot,—your own services—are equally valueless, without a market. Transportation provides and develops this market. Transportation, therefore, is wealth to the community. Each business day 890 Key System trains furnish transportation to residents of the Eastbay cities and to visitors.

Should this system deteriorate, or cease, your own discomfort would be the first result. Your value would diminish.

Depreciation of every dollar invested in the Eastbay district and every advantage of living here inevitably would follow.

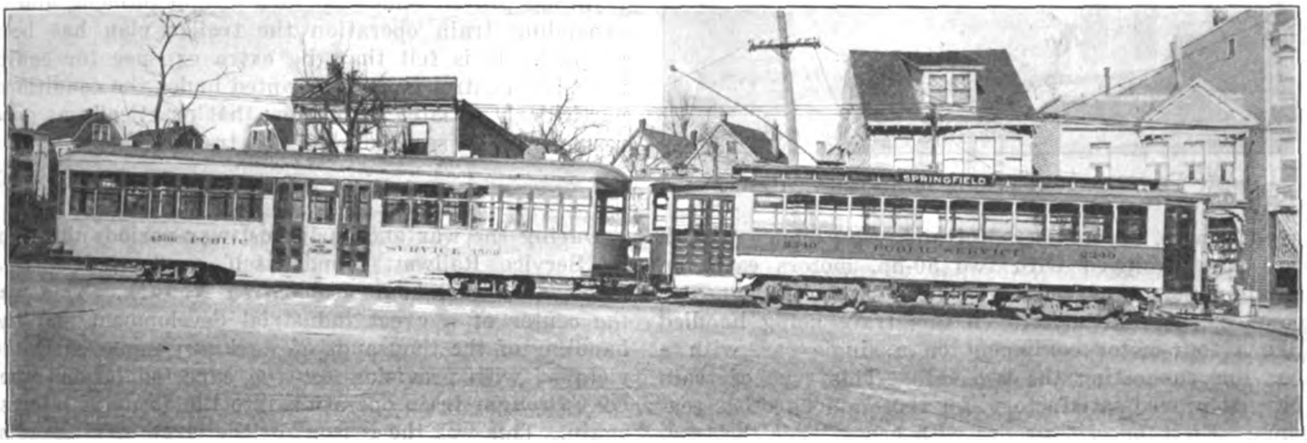
To maintain the existing service the income must meet the necessary expenses of operation.
We have no source of revenue except fares.

SAN FRANCISCO-OAKLAND
TERMINAL RAILWAYS

RECENT EXAMPLE OF PUBLICITY MATERIAL FROM THE PACIFIC COAST

Train Operation in New Jersey

After Tests Covering Various Operating Conditions, in Which Considerable Research Work Was Done and Both the Theoretical and Practical Aspects of the Subject Were Given Full Consideration, the Public Service Railway Adopts Trailer Operation on a Large Scale—Details of Recent Tests Are Given


SPRINGFIELD
PUBLIC SERVICE

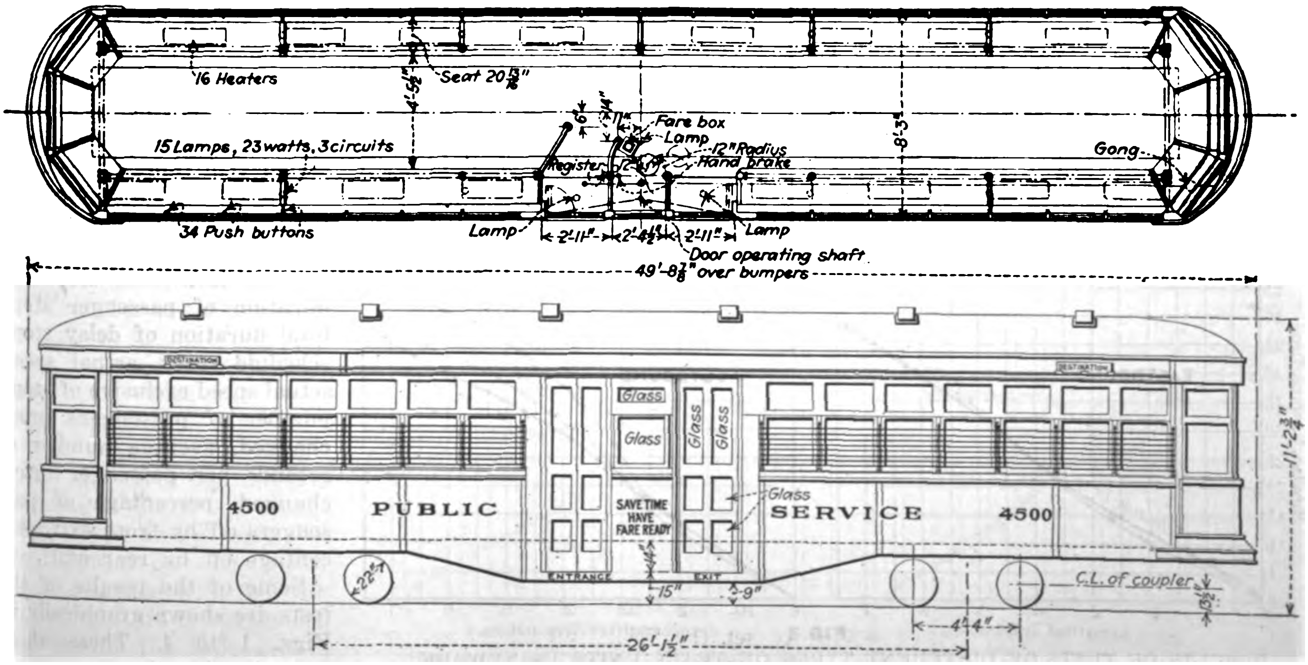
MOTOR CAR WITH TRAILER OF NEW TYPE, PUBLIC SERVICE RAILWAY

THE Public Service Railway, with headquarters at Newark, N. J., has received the first of an order of 100 trailers from the Osgood-Bradley Car Company. This forerunner of the large group of cars has been in operation in Newark for several weeks with good results.

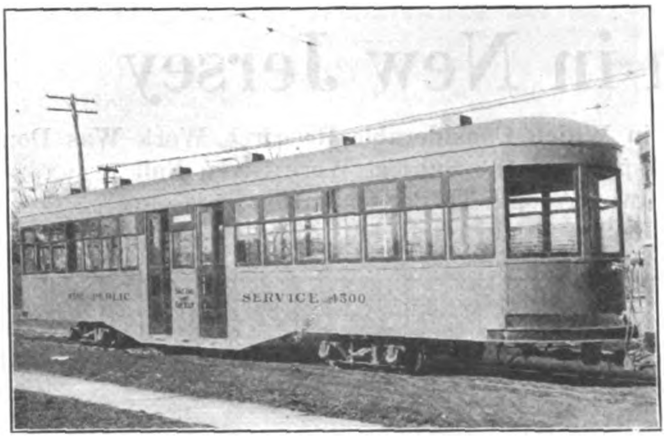
The use of trailers is a comparatively new development on this property, although multiple-unit trains have been used for several years. The company has done considerable research work in the field of train operation, and the present plan involving the use of light trailers rather than multiple-unit cars is the result of an evolution in which both the theoretical and practical aspects of the subject have been given full consideration.

About eight years ago the company made a series of train tests which were summarized in the issue of this paper for July 5, 1913, page 10. These tests were the result of the necessity for increasing track capacity during the rush hour on certain sections of the property. They demonstrated the practicability of train operation under local conditions, and the effect in slowing up schedules was found not to be so serious as to offset the greater carrying capacity of the train unit. In the tests the characteristics of a single car, a multiple-unit train and a motor car and trailer were compared, with the result that the multiple-unit train appeared to be the best.

Following the test period a number of trains were put in operation on the property and are still giving


16 Heaters
Seat 20 13/16"
4'-5½"
15 Lamps, 23 watts, 3 circuits
6"
1'-4"
11"
Fare box
Lamp
12" Radius
Hand brake
Register
8'-3"
Gong
34 Push buttons
Lamp
2'-11"
2'-4½"
2'-11"
Lamp
Door operating shaft
49'-8⅞" over bumpers
DESTINATION
Glass
Glass
Glass
Glass
Glass
4500
PUBLIC
SAVE TIME HAVE FARE READY
SERVICE
4500
ENTRANCE
EXIT
22"
15"
9"
C.L. of coupler
13½"
11'-2¾"
4'-4"
26'-1½"

PLAN AND ELEVATION OF PUBLIC SERVICE RAILWAY TRAILER



NEW TRAILER FOR PUBLIC SERVICE RAILWAY

good service. A number of trains were made up with two cars equipped with two 50-hp. motors each, on maximum-traction trucks. These were permanently coupled, the four motors on this train being handled like a four-motor equipment on a single car, with a bus line connecting the two cars. This type of train has not proved satisfactory, for these among other reasons: First, on stiff grades with heavy loads the traction in wet weather or on wet rails is not sufficient to maintain speed, hence the line is "slowed down." That is, the drivers slip and spin too much to permit the making of schedule speed. Again the unit gives trouble at switches, the derailments being too frequent for dependable operation.

A better train was found to be one made up of four-motor cars with H L multiple-unit control, and 128 cars so equipped were put in service. These cars have the advantage of ease of coupling and uncoupling, and the plan was to use them singly or in trains as the exigencies of the service required. As a practical operating proposition, however, it has worked out that the administrative difficulties in the carhouses in getting trains made up and broken up at the right times have worked against the use of the cars other than as single units. The consequence is that the multiple-unit train has proved somewhat of a disappointment, and in expanding train operation the trailer plan has been adopted. It is felt that the extra expense for equipment and control is not warranted under the conditions, particularly as later tests show that practically as good results can be secured with the trailer plan.

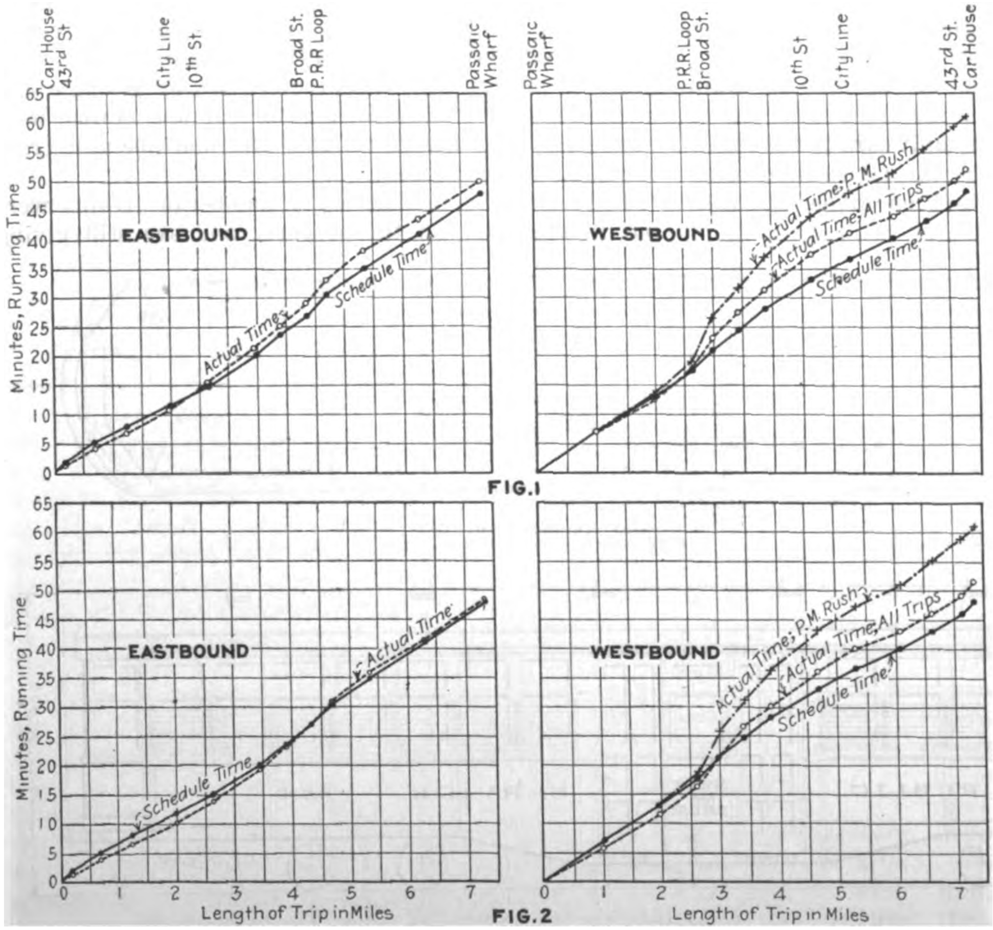
THE 1920 TESTS

During the war and early post-war periods the Public Service Railway found itself confronted with a tremendous rush-hour problem in Newark. This was the center of a great industrial development and the handling of the thousands of workmen employed in the vicinity, with provision for the expected larger numbers, brought train operation into the focus of interest again. This was the reason for the large investment in the new trailers. Since they were ordered there has been a temporary slump in the local industries so that the trailers will not at once be used in their intended service, but they will be distributed to points of maximum rush-hour congestion.

To determine the probable effect of the trailer operation on the schedules and on the equipment of the motor car some service tests were made last spring with the single car (four motors), the 4-4 motor train (four motors on each of two cars), the 4-2 motor trains and the 4-0 motor train (motor car and trailer). These tests were made on the Springfield line, Newark, and they covered the morning and evening rush hours for four days, from March 29 to April 1, 1920.

The data secured were as follows: Leaving time, arriving time, schedule trip time, actual trip time, per cent off schedule time, mileage of trip, total number of stops, average number of stops per mile, average duration of stop, total duration of passenger stops, total duration of delay stops, schedule speed, actual speed, actual speed exclusive of stops, number of passengers interchanged, average number of seconds per passenger interchanged, percentage of passengers off by front exit, percentage off by rear exit.

Some of the results of the tests are shown graphically in Figs. 1 to 4. These show averages for the four days.



RESULTS OF TESTS OF DIFFERENT TYPES OF TRAIN UNITS IN NEWARK: FIG. 1—4-4 TYPE TRAIN. FIG. 2—4-2 TYPE TRAIN.

On the first of these days the prevalence of a fine drizzle resulted in slippery rail, but particular attention was given to sanding to offset this. On the other days conditions were practically perfect. The results show that under conditions of the test there was little difference among the units so far as adherence to schedules was concerned. The following table, which covers averages of twenty-four trips, indicates this:

RESULTS OF TRAIN TESTS IN NEWARK

Type of Train	Per Cent Adherence to Schedule	Stops per Mile	Average Number of Passengers Carried per Trip	Number of Trips Made in Schedule or Better
4 = 4	108.1	6.4	76	6
4 = 2	102.2	5.4	71	12
4 = 0	105.4	6.6	83	8
Single car	106.8	6.3	66	11

The 4-0 train was very slow on grades, often not starting until the third point on the controller was reached, picking up very slowly until that last two points had been attained and then going with a jerk. Starting conditions were better on the level. There was a perceptible jerk on the second car on stopping and starting. The public, being unused to this train arrangement, was slow in boarding the second car, consequently the load on this was small except on the heaviest of the rush-hour trips. The tests did not show what would have occurred if track conditions had not been good. The train would presumably encounter some difficulty on the grades.

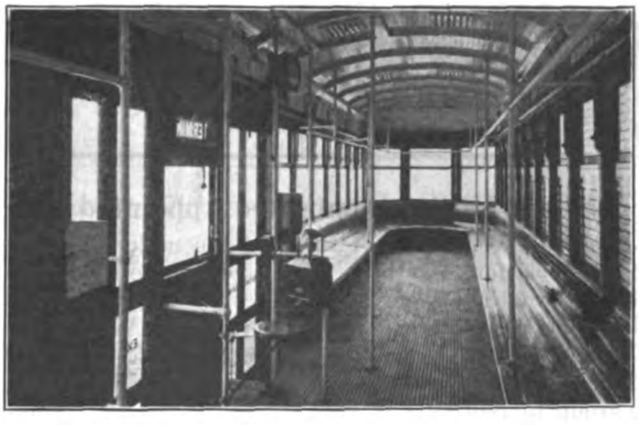
The 4-2 train started almost as smoothly as the 4-4, although in the test the latter naturally shows up best of all. The former, however, made somewhat fewer stops per mile and carried fewer passengers.

In a comparison between the 4-4 and 4-2 trains, the latter was seen to be as good as the former for all practical purposes, while the 4-0 train was evidently all right for fairly level routes or on reasonable grades with good track.

Figs. 1 to 4 show that all units can hold schedule outside the congested districts, which lie largely between Tenth Street and the Pennsylvania Railroad loop. In the congested districts the traffic and the traffic officer have more influence on the operation of the cars than the equipment or the motorman.

One might ask why the schedule should not be fitted to the actual rush-hour condition. To this the company replies that it is better to set the schedule to suit the non-rush hours and to adjust the layover, over which the timetable department can exert control, to provide for delays.

The new operating unit will comprise a motor car of the "2200" type and a trailer of the "4500" type. The motor car is equipped with four 40-hp. motors. It is single-end, and 100 of the type are in operation.



CONDUCTOR'S STATION IN NEW PUBLIC SERVICE TRAIL CAR

The trailer is in most respects similar in design to the latest Cleveland trailer. It is mounted on the Osgood-Bradley Car Company's light archbar swing-bolster trucks and weighs fully equipped, with farebox, 23,300 lb. The trailer has been made as simple as possible and longitudinal seats are provided to furnish the maximum capacity. As many as 180 persons can be accommodated with reasonable comfort, and in a pinch 200 can be carried.

Both motor car and trailer are wired for passengers' electric stop signals, but clapper bells are used for the start signals. The conductor's station is near the middle of the car, between the doors and facing toward the rear. Railings are installed on the trailer so that entering passengers pass to the conductor's right and distribute themselves throughout the car after paying their fare. The arrangement is such that he has ideal control over passenger interchange.

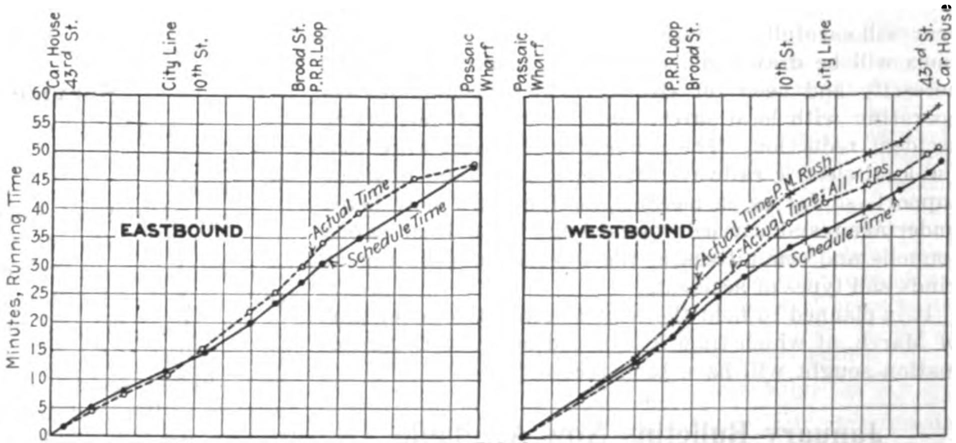


FIG. 3

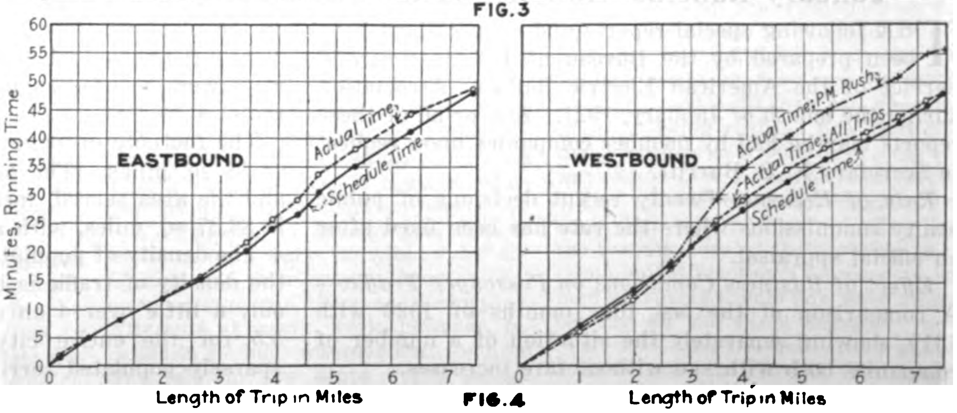


FIG. 4

RESULTS OF TESTS OF DIFFERENT TYPES OF TRAIN UNITS IN NEWARK: FIG. 3—4-0 TYPE TRAIN. FIG. 4—SINGLE CAR

Association News

Joint Utility Committee Appointed

A JOINT committee of three of the national utility associations has been organized by the American Gas Association, the National Electric Light Association and the American Electric Railway Association. The purpose of the committee is to promote co-operation and each of the organizations mentioned has designated a group to represent it as members of the joint committee, which, as at present constituted, consists of:

Randall Morgan, B. C. Cobb, Frank W. Frueauff, H. G. Bradlee, Lucius S. Storrs, Charles A. Munroe, Joseph K. Choate, E. C. Faber, J. B. McCall, John W. Lieb, R. A. Carter, O. D. Young, Henry L. Doherty, S. Z. Mitchell, P. S. Young, P. H. Gadsden, W. W. Freeman, Charles L. Edgar, A. P. Lathrop, B. I. Budd, M. H. Aylesworth, E. B. Burritt and O. H. Fogg.

Committee on Safety Meets

THE joint T. & T. and Claim Associations committee on safety met at association headquarters on Feb. 2. Those present were E. C. Spring, Lehigh Valley Transit Company, Allentown, Pa., chairman; R. E. MacDougall, New York & Harlem Traction Lines; H. V. Drown, Public Service Railway, and J. W. Welsh, special engineer of the association.

The committee plans to send a request to member companies for information covering accidents, their costs and what has been done during the past year in the way of safety-first campaigns. The report for the year will carefully analyze the replies received. Deductions will be drawn and an attempt made to show the necessity and need for electric railway companies cooperating with local safety councils and committees in accident reduction. The committee will also urge that the local electric railways give both moral and financial support, so far as is possible, to the work now being undertaken and carried forward by these local safety councils and committees in the interest of reducing all kinds and types of accidents.

It is planned to hold the next meeting the latter part of March, at which time it is hoped much of the information sought will have been received.

January Bulletins Now Available

THE following special reports and compilations have been prepared by the Bureau of Information and Service of the American Electric Railway Association during the month of January, 1921. Any or all of these reports may be had by member companies upon request to Secretary E. B. Burritt.

Rate of Return.—Twenty recent decisions of public utility commissions where the rate has been fixed after an official appraisal.

Effect of Business Conditions on Passenger Traffic.—A comparison of the last four months of 1920 with 1919, showing separately the situation of a number of companies both with and without fare increases.

Interurban Rates of Fare.—This shows the present and former rates, effective dates and whether on a mileage or zone basis, etc.

Analysis of Agreements Covering Working Conditions of Trainmen.—Supplementing report of last month.

Supplement on Trackless Trolleys.—This includes descriptions of systems in Bradford and Tees-Side, England, and Wurzen, Saxony, a proposed alternating current system, and a bibliography of all articles up to date.

The bulletins on city fares, wages of trainmen, cost of living and cities having motor bus service have also been brought up to date.

Letters to the Editors

Interurbans Need More Attention

THE WINONA INTERURBAN RAILWAY COMPANY
WARSAW, IND., Feb. 1, 1921.

To the Editors:

The editorial under the caption "The Interurbans Require Greater Attention," in the Jan. 1 issue of the JOURNAL, sounds a keynote that should arouse considerable interest.

You will remember that in a letter to you some months ago I contended that strictly interurban problems had become entirely lost in general publicity campaigns, so that in looking at the traction situation as a whole the general public could see only the street car problems of our larger cities.

I am still insisting that interurban transportation is entirely different in character than city street car service, and am glad to see your valuable publication take the matter up editorially.

J. C. SCHADE,
General Manager.

Service in Cincinnati

DEPARTMENT OF STREET RAILROADS
CINCINNATI, Jan. 28, 1921.

To the Editors:

The article from Lucius S. Storrs in your issue of Jan. 1 is so valuable that I hesitate to say anything that might be construed as a criticism. However, the statement that I ordered a reduction of service in order to keep down fares is susceptible to some misinterpretation. What I did order was a readjustment of service by reducing service in the non-rush period, where it was excessive, and applying it to the rush hour, where it was needed. This resulted in a saving of $500 a day in platform time, and actually improved the service during the period when the people are riding. No headways were reduced enough to cause any material inconvenience.

The footnote on page 17 gives the area of Cincinnati as 58 sq. miles. The area of Cincinnati proper is 72 and the area served, including contiguous communities, is 83.27 sq. miles, with a population of 454,000.

The density of population is low, and as a consequence the density of traffic is lower than in most cities, being only a little over 4 on some lines, with an average of 5.5 for the entire city. These long hauls through sparsely populated territory are characteristic of Cincinnati and affect the car-mileage costs and consequently the rates of fare.

W. C. CULKINS, Director.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Franchises Canceled

Chicago Council Acts to Nullify 1907 Ordinances—Disposal of $25,000,000 Traction Fund a Poser

The City Council of Chicago, Ill., on Feb. 4, voted to cancel the 1907 traction contract-ordinances with the several companies constituting the Chicago Surface Lines. The considerations leading up to this action were quite fully reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 5, 1921.

There is some question as to what effect this action of the City Council will have upon the franchise situation. Inasmuch as these ordinances were originally adopted by referendum vote, it is probable that action of the same authority will be required to cancel them. Furthermore the companies have not been a party to the cancellation.

The action will probably hasten the decision of the Circuit Court, which has had before it for several months a petition from the city hall to cancel the contracts. If this court should hand down a decision declaring that the contracts had been abrogated by the companies by the steps they have taken in violation of the contract provisions but in keeping with the orders of the State Public Utilities Commission, it is quite probable that the matter would be appealed to a higher court.

The ordinance passed by the City Council carried with it instructions to the law department immediately to petition the new Public Utilities Commission to order track extensions amounting to about 110 miles, and other service improvements.

When the City Council was about to vote on the cancellation of the contracts, an Alderman raised the question whether the city would not thereby lose its right to the 55 per cent share of the net profits of the companies. The city law department admitted that it would. The city's share of the profits for 1920 will be approximately $2,100,000. The sum of approximately $1,700,000, which accrued to the city for the fiscal year ended Jan. 31, 1920, has not been paid, since the city hall declined to accept it because it was alleged that in so doing it would acknowledge the contract ordinances to be in effect, whereas it had declared them abrogated.

The traction fund has accumulated about $25,000,000, which was to be used, according to the ordinances, in the purchase of the traction lines or in building subways. If the contracts are canceled, there is some question as to how this fund may be disposed of. According to a State Supreme Court decision, the city has no power to divert this fund to general corporate purposes. The city's special traction counsel has suggested that the city might construct subways with this and lease them to the proposed transportation district boards. It is quite probable that the General Assembly will want detailed information about this fund, when it comes to the consideration of the proposed act which would create the transportation district and bring about public ownership.

According to one of the Aldermen, it is the intention of the city administration to submit the Mayor's plans for a transportation district to the voters at the election on Feb. 22. This is, however, probably impossible.

Ousting of Commission Heard

The Court of Errors and Appeals of New Jersey on Jan. 19 heard argument in the appeal of the State Public Utility Commissioners from the recent decision of the Supreme Court which upheld Gov. Edwards' power to remove the board and name a new commission. The Supreme Court's ruling was the result of quo warranto proceedings brought in the name of the State by Attorney-General McCran, questioning by what right the utility board continued in office after the Governor's order of ouster.

The old board is not fully functioning, and the new board appointed by the Governor to take the place of the ousted commissioners cannot act until the Senate confirms the names of the appointees.

Violence Follows Attempt to Restore Service

Violence attended the effort made on Feb. 8 by the United Traction Company to restore service on its lines in Albany and Troy, N. Y. No attempt was made at first to run cars in the Cohoes, Watervliet, Rensselaer or any of the villages served by the company's lines.

The effort to restore service was made under orders of the Public Service Commission for the Second District in the face of the opposition of 1,200 employees, who went on strike more than a week ago in protest of a wage reduction from 60 to 45 cents an hour.

A great deal of damage was done to the overhead work in Albany by the strikers and their sympathizers so that no cars were run there on Wednesday. Attempts at repair work, however, resulted in so much disorder that the need was felt for the State Police to use their pistols to quell the rioting.

The only car sent out in Troy that day was stalled by the wires being cut.

Toledo's Trial Week

Traffic Increased 7 per Cent Under Lower Fare, but the Earnings Decreased 5 per Cent

The first week of operation of the railway system of Toledo under the Milner service-at-cost ordinance by the Community Traction Company has resulted in an increase of 7 per cent in passengers carried.

A. Swartz, superintendent of transportation, declared the decrease in fares from 7 to 6 cents ought to be responsible, according to past experience, for a gain of about 5 per cent in riding. It is thought the other 2 per cent gain is due to the feeling on the part of the public that the railway system is semi-publicly owned and controlled under the new plan.

The decrease in fares, however, has resulted in a decline of 5 per cent in the revenues derived from the passenger service.

The reduction in the charge for fares from 7 to 6 cents and in the charge for transfers from 2 to 1 cent means a reduction of approximately 12 per cent on the local lines.

The offices of the Community Traction Company, have been set up in the fourth floor of the Toledo Railways & Light building, the entire floor having been turned over to the new company.

As will be noted from the figures on the first week's traffic, the railway is losing over what it was doing on the seven and two rate of fare. What effect this will have upon the stabilizing fund cannot yet be determined. However, all officials of the Community Traction Company and the commissioner are trying to cut expenses of operation to the bone in order to prevent an increase in fare at the end of the first six-month period.

JITNEYS MUST GO

The Rail-Light lost approximately $700 a day from jitney competition during the last year. No complaint was made by the Rail-Light, but the public has begun to take up the matter since the new ordinance has gone into effect, it being realized now that additional revenue of $700 a day to the railway would tend to bring down fares.

The railway campaign against accidents has also received impetus from the turning over of the property to the Community Traction Company as savings in these accounts now have a direct bearing on the fares charged.

W. E. Cann, the new street railway commissioner at Toledo, has entered upon his duties. A portrait and a biography of him are published elsewhere in this issue.

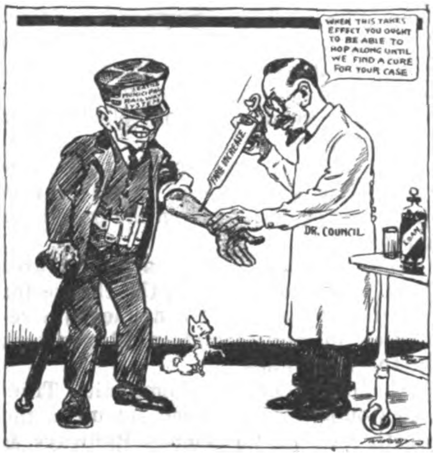
Seattle Drove Poor Bargain

City Paid $15,000,000 for Property Investigator Reports Worth $7,843,000—Rescinding of Purchase Recommended

Presiding Judge J. T. Ronald of the Superior Court of Seattle, Wash., has received the report of the King County Grand Jury's investigation of the purchase of the railway lines of the Puget Sound Traction, Light & Power Company at Seattle by the city. The Grand Jury finds that the terms of the city's contract cannot be fulfilled. It says that the city is entitled to equitable relief and that the City Council should take steps to obtain such relief. It considers the lines taken over at $15,000,000 by the city to be worth only $5,000,000. It also says that if the city completes the purchase according to the contract the cost will be $23,752,550 in principal and interest.

AT THE same time Wilmon Tucker, special investigator for the Mayor, has reported to Mayor Caldwell that the company is guilty of constructive if not actual fraud with reference to the value of the railway property.

He says that the city should be relieved of the unjust burden.


WHEN THIS TAKES EFFECT YOU OUGHT TO BE ABLE TO HOP ALONG UNTIL WE FIND A CURE FOR YOUR CASE
FARE INCREASE
DR. COUNCIL
LOAN

SEATTLE "TIMES'" IDEA OF FARE INCREASE

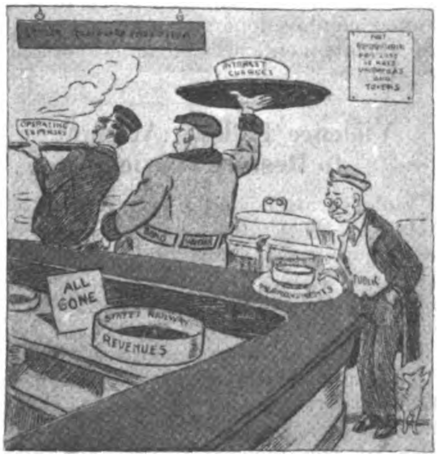
The Grand Jury goes on to say that "the city has taken over a property which was earning less than 2 per cent on $15,000,000 and has undertaken not only to pay 5 per cent interest on $15,000,000 of utility bonds but also to pay out of the gross revenues of the system the entire amount necessary to retire the bonds in twenty years in addition to operating and maintenance expenses and depreciation. In our opinion it cannot be done."

The text of the report of the Grand Jury is concerned very largely with the history of the negotiations, all of which were followed closely in the ELECTRIC RAILWAY JOURNAL at the time. The findings of the Grand Jury are scattered throughout the report of that body.

The Grand Jury agrees with Mr. Tucker that at the time of the purchase the fair physical value of the property in its then depreciated condition was not to exceed $7,843,000. That body says, however, that the earnings of the system had been such that considering it as an investment on the basis of its revenue earning capacity the jury believes that at the time of the transfer to the city it was worth not more than $5,000,000.

The principal findings of the Grand Jury detached from the text are as follows:

> It appears from the evidence that no proper or sufficient investigation was made by the city authorities to ascertain the true value of the system which the city was proposing to buy.
>
> What would seem to the jury to be the most important and the one indispensable precaution to have taken before binding the city to such an agreement would have been to have an actual physical appraisal of the properties made. This was never done.
>
> After diligent search and investigation of all sources of information known to this jury we feel it only fair to those individuals in public office or otherwise, whose names have been mentioned in connection with the deal, to say that we find no evidence of corruption and nothing tending to show that anyone holding an official position with the city profited financially by the transaction. The jury has attempted to trace certain rumors of corruption which have been called to its attention, but in every instance it has concluded that such rumors were founded on idle talk by individuals having no knowledge of the facts.
>
> On the basis of the evidence submitted and available to the jury, however, it appears that the negotiations leading up to the purchase were characterized by slack business methods on the part of the Mayor and Council. We find nothing which subjects the city law department to criticism in connection with this transaction.
>
> In view of the apparently extortionate price paid for the properties we feel that the public should be advised of the facts indicating how the purchase of the street railway system came to be made.
>
> The terms of the contract were never agreed upon or made known until long after the vote of the people taken on Nov. 5, 1918. This vote was taken without authority of law. The final contract was not executed until long after the war emergency had passed.



NOTHING LEFT FOR PUBLIC, ACCORDING TO SEATTLE "TIMES"

> We find that if the city of Seattle completes the purchase of the street car lines, according to the terms of the contract, that the people will pay $15,000,000 principal and $8,752,550 in interest, a total of $23,752,550, and in the same period of time it will be practically necessary to reproduce the system.
>
> In addition to these figures the city will have lost by reason of the fact that under the ownership of the Puget Sound Traction, Light & Power Company 2 per cent of the gross receipts were paid to the city, which no longer will be paid, in a period of twenty years a sum estimated at over $3,750,000, and will have lost in the same period in taxes formerly paid by the traction company approximately $4,601,280, making in all a total of over $32,103,830.
>
> In this connection it should be borne in mind that by the terms of the contract the city has bound itself to purchase power from the Puget Sound Traction, Light & Power Company or purchase power from that company until such time as the city sees fit to buy the substations now belonging to the Puget Sound Traction, Light & Power Company, which were not included in the original purchase, these substations to be purchased at a price based upon the then reproduction cost of such substations, less depreciation.
>
> We find further in connection with the operation of the street car system by the city that there has already been charged to and paid out of the general tax fund, and not out of the city railway funds, during the year 1919, the sum of $105,725, and in the year 1920 $117,803.
>
> The present financial condition of the system, which is a matter of public knowledge, is not in our opinion due to mismanagement of the lines since the city acquired them.
>
> The city has taken over a property which was earning less than 2 per cent on $15,000,000 and has undertaken not only to pay 5 per cent interest on $15,000,000 worth of utility bonds, but also to pay out of the gross revenues of the system the entire amount necessary to retire said bonds in a period of twenty years, in addition to operating and maintenance expenses and depreciation. In our opinion it cannot be done.
>
> From the evidence submitted and available we believe this contract is incapable of performance according to its terms. We believe that the evidence in the hands of the Mayor and otherwise available shows facts such as should entitle the city to equitable relief.
>
> We, therefore, recommend to the City Council that it take the necessary steps to secure the same.

As stated previously Mr. Tucker charges constructive if not actual fraud with reference to the value of the property turned over to the city in the $15,000,000 purchase. He recommends in brief that the City Council return the property taken on the contract and ask the return of the bonds issued in payment for the lines, and recommends that in the event the Council is unwilling to take such action the taxpayers themselves initiate legal proceedings to relieve themselves from the unjust burden.

The Mayor concurs in the recommendations of Mr. Tucker. He further advises the employment of Mr. Tucker as counsel to assist the Corporation Counsel in any legal action that the Council may take. Mr. Tucker's report was sent to the Council accompanied by a letter from the Mayor, in which the latter says that while some may be disappointed that the investigation disclosed no graft or corruption the reports of the Grand Jury and of Mr. Tucker justify every statement the Mayor has made in connection with the purchase either during his campaign or subsequently.

Mr. Tucker says that the property as of the purchase date represents a value not to exceed $7,843,000. In concluding his report Mr. Tucker says:

> The city of Seattle has not invested any of its money in the street railways and has not agreed to do so. It is in the position of a trustee, having taken possession of the lines under an agreement to pay the former owners first and the necessary operation expenses thereafter, and it has been demonstrated that the instrument creating the trust is incapable of performance according to its terms.
>
> In the event that the company is not willing to rewrite the contract upon a fair and just valuation and under terms that can be performed, the trustee (the city of Seattle) is in a position to restore the com-

pany to its former position. It has paid to the bondholders, for the company (for the latter was obligated to pay them under the terms of the mortgage for which the bonds were substituted), 5 per cent on the full $15,000,000, or to date $1,125,000, which can be regarded either as interest, dividends or rental for the property. The city has paid to the Stone & Webster interests for power with which to carry out the terms of trust, during 1919 and 1920, the sum of $1,103,101, about half of which is clear profit to the former owners of the lines.

When it is considered that for five years immediately preceding the taking over of the lines by the city the company was making five-eighths of 1 per cent on a basis of $15,000,000 and since that time it has been receiving full 5 per cent on the $15,000,000 it is apparent that the lines were turned over to the city under a contract pursuant to which the company could not lose, and it has been amply compensated in every way.

From my investigation of the facts and the law I have reached the following conclusions:

1. That the company was guilty of constructive if not actual fraud with reference to the value of the property, by which the city was induced to agree to pay more than twice its real value.

2. That the contract is impossible of performance according to its terms, and the city is under no obligation to enhance the value of the bonds by furnishing additional funds or security in an endeavor to carry out the contract.

The case of Twitchell vs. the City is not determinative of the city's right, as the way is left open to show in a proper proceeding by actual proof that the contract cannot be carried out by the city on the plan adopted without invasion of tax funds.

I advise that the city make an offer to rescind, tender back all the property and ask for a return of the bonds. If the tender is not accepted the city should bring an action in equity to rescind the sale. If the City Council does not wish to do this, and takes the position that it is satisfied with the sale, as it apparently did in the Twitchell case, then taxpayers should institute appropriate legal proceedings to relieve us from the unjust burden.

Campaign Against One-Man Cars

Plans are being made to induce the passage by the Missouri Legislature of a bill to prohibit the operation of one-man cars in St. Louis, Kansas City, St. Joseph, Springfield and Joplin, the five largest cities in the State. The measure would require a motorman and conductor on every car and one additional man for each trailer. It follows:

> An act to amend article 5, chapter 33 of the Revised Statutes of Missouri, 1909, entitled "Corporation, private" by inserting after section 3303a thereof a new section to be numbered section 3303aa.
>
> Be it enacted by the General Assembly of the State of Missouri, as follows:
>
> Sec. 1. Amending article 5, chapter 33, by enacting new section.... That article 5, chapter 33, of the Revised Statutes of Missouri, 1909, entitled "Corporations, private" be and the same is hereby amended by inserting after section 3303a thereof a new section to be numbered section 3303aa and to read as follows:
>
> Sec. 3303a. . . . It shall be the duty of every corporation, company, individual, association of persons, their trustees, lessees or receivers, that now or hereafter may own, control, operate or manage any street or electric railway in any city in this state containing more than seventy-five thousand inhabitants to provide not less than two employees or agents for the operation and control of each one of its cars, provided, that in cases where two or more cars are attached to each other then not less than two employees or agents shall be provided for the operation and control of the first of said cars and one additional employee for each additional car.

A similar measure is being agitated in Iowa. Charles Rogers, president of the local union of Amalgamated Association in Davenport, is quoted as follows:

> We have a mass of information on these cars and their operation all over the Middle West. We have no occasion to use it now but when the question crops up in a way to affect labor we will be able to back whatever stand we take with sufficient evidence.

Municipal Railway Crossing Illegal

Court Orders Discontinuance of Service Over Crossing at Detroit City Stole in Defiance of Injunction

Judges Ray Hart of Midland and Clayton C. Johnson of Coldwater decided on Feb. 4 that the crossing of the Mack Avenue tracks of the Detroit United Railway by the city railway was illegal. In consequence operation of the municipal cars over the St. Jean crossing was discontinued Saturday afternoon, but not until Elliott G. Stevenson, attorney for the Detroit United Railway, had requested Clarence E. Wilcox, Corporation Counsel, to stop the city cars from crossing Mack Avenue. A further court order had been expected by the Street Railway Commission than that contained in the original injunction allowed by Judge Dingeman and violated by the city.

THE judges held in the opinion handed down that city wires touching the Detroit United Railway wires must be disconnected. The crossing was not ordered removed. Tracks and wires are to be disconnected upon the order of Mr. Goodwin, municipal railway manager, as soon as possible, as a result of the judges' decision.

Judge Dingeman's restraining order was held valid and the judges' opinion also stated that the order was properly served by E. J. Burdick, assistant general manager of the Detroit United Railway, before he was arrested by the police and taken to Belle Isle. It is also held by the judges that the crossing was not properly constructed from an engineering standpoint.

The court held that although a mandatory injunction could be issued compelling the removal of the crossing, and while it believed that the crossing should be restored to its original condition, it also believed that the people should not be inconvenienced by having the tracks, wires and road bed again torn up.

The writ provides for the disconnection by the city of its tracks, and all connecting wires from the tracks and wires of the company in such a manner that no electric current will be diverted from the company's tracks and wires, and the city is restrained from using or crossing the street railway tracks of the company with city cars or wires at the intersection of the streets mentioned, until further order from the court. The motion of the city to dissolve and vacate the restraining order issued by Judge Dingeman, is denied by the court.

In reviewing the evidence, the court, in accord with the contention of the Detroit United Railway is of the opinion that if Mr. Burdick did not succeed in making a complete service of the restraining order it was due to the interference and conduct of city officials and employees. The city officials are held to have had sufficient knowledge of the purpose and terms of the order to have observed the provisions and refrained from constructing the intersection until the legal rights could have been finally determined by the court.

As a result of the decision application will be made to the Wayne County Circuit Court to have the city's right determined relative to crossing the Detroit United Railway tracks with the municipal ownership tracks. This right or lack of right was not discussed in the opinion of the judges who heard the arguments in the case last month The form of mandatory order which the Detroit United Railway asks of the judges conforms in general with the one outlined in the court's opinion.

Much depends upon the action the higher court takes upon this question of crossing, since several of the other proposed municipal lines are planned to cross Detroit United Railway tracks. The Municipal system would be seriously hampered in event the Supreme Court upheld an order restraining the city from making the crossings.

Passengers using the St. Jean line after the cars were stopped from crossing Mack Avenue were given car-to-car transfers and had to walk across the Detroit United tracks.

According to Mr. Goodwin, the car schedule has been worked out so that no waiting for connections will be necessary. The municipal ownership cars which are shut off from the temporary St. Jean carhouse by the Mack Avenue crossing are being left at night at the end of the line in care of a watchman. Necessary repairs made in the open. Two steam road crossings have been installed eliminating the two former breaks in the municipal ownership line at these points.

Secretary and Securities Disappear Simultaneously

Warrants issued on Feb. 1 at Minneapolis for Berger T. Jaeger, until a week before that confidential secretary of A. M. Robertson, president of the Duluth Street Railway, revealed that coincident with Jaeger's disappearance on Jan. 25 negotiable securities to the amount of $157,000 of the Duluth company also disappeared.

The police of eastern cities have been notified to be on the lookout for Jaeger. He was one of Mr. Robertson's most trusted employees.

Herbert Warren, vice-president and general manager of the railway company at Duluth, has said that the securities had been held in reserve for the purpose of paying taxes and bond interest of the company and that the theft was not protected by any security company. The securities missed include $80,000 in United States Treasury certificates, $25,000 in Canadian Northern bonds and $52,000 in British Goverment bonds.

The warrant for Jaeger is based on the disappearance of a check for $4,825.

Expert Not Enthusiastic

Dr. Wilcox Sees Perpetuation of Strife Between State and City Under Governor Miller's Plan

The discussion that has been precipitated by the message of Governor Miller to the Legislature of New York on the public utilities is characterized by so much positiveness and so much opposition that the still, small voice of moderation can hardly make itself heard. This was the opinion expressed by Dr. Delos F. Wilcox, speaking before the City Club of New York on Feb. 7. Dr. Wilcox said that the Governor's plan strives to do the impossible. As he saw it the Governor went as far as he could in taking away from the municipality the power of control, but the city would still be clothed with power to obstruct action through its constitutional control over routes and through its conceded control over the use of city funds. It was the opinion of Dr. Wilcox that if in the nature of the case co-operation of state and local authorities was an essential condition precedent to a wise solution of the problem it would be fatal to proceed in such a way as further to arouse the spirit of antagonism between the city and the state.

He said the club was practically in complete accord with the Governor's declared objective, but was sure the Governor's plan for a state-appointed commission clothed with all the state powers of action was the wrong method of approach to a solution of the problem. It was his opinion that the Governor need not fear the attitude of the people of New York if the plan to be devised by the Governor's commission should prove to be all that he promised for it. The Governor's commission might be able in the face of local opposition to raise fares. It could not, however, bring about a permanent and salutary solution of the entire problem without local co-operation.

Dr. Wilcox summarized his remarks as follows:

> The Governor's ultimate objective as outlined in his message of Jan. 24 is almost wholly in harmony with the ultimate purpose to which we have long given our support.
>
> The Governor's proposed method of reaching the ultimate objective in transit development through the arbitrary exercise of state authority and the abrogation of the partial home rule now enjoyed by the city is fundamentally unsound. It might be successful in bringing temporary financial relief to the companies through an increase in fares, but it could not effect a permanent solution of the problem consistent with the public interest or with the Governor's own declared purposes.
>
> The logical first step toward a permanent solution based upon the public interest, which the Governor sets forth as his objective, is the enactment of the permissive municipal ownership bill applicable to all cities of the state and to all franchise utilities. This bill is now pending in the Legislature.
>
> The second logical step would be the appointment, under the enlarged powers of home rule granted by the municipal ownership bill, of a local commission to make a comprehensive study of the traction problem from the point of view of municipal interests, and to devise a plan for its solution. In lieu of this the Governor's program might be made acceptable to the people of New York City if the proposed transit commission's plan were made conditional upon its approval by the Board of Estimate and Apportionment or by the electors of New York City at a referendum.
>
> As it stands the Governor's commission plan invites local hostility where local co-operation is requisite to the success of any transit settlement that may be proposed. Without such co-operation the practical result of the legislation recommended by the Governor is pretty sure to be a surrender of public rights without compensating concessions from the companies; a deepening of the political antagonism which has poisoned the relations between the city and the State for the last hundred years; and a distinct weakening of the forces at work in New York City loyal alike in victory and in defeat to the ideals of efficient self-government.

Detroit Preparing to Buy More Equipment

Thorough surveys of proposed routes and equipment for the remaining 82 miles provided for by the A and B routes of the Detroit (Mich.) Municipal Railway have been ordered by the Board of Street Railway Commissioners.

The engineers have been directed to proceed with a view to beginning actual construction as soon as possible. It is planned to double the construction equipment now on hand and bids will soon be asked for steel rails, ties and special work. General construction will be undertaken in the spring, including the completion of the Charlevoix-Buchanan cross-town line, the Clairmont-Owen cross-town system and two north and south lines on the east side. These two are named as the next sections to be constructed.

Lawsuits are anticipated by the commission opposing the construction of some of the lines. If suits are started it is believed that the building of the line involved will be postponed and another started in its place.

The city proposes to build 82 miles of track this summer. It has already issued bids for ten steam shovels and will place orders through the city purchasing department for wire, rails and special work shortly.

Construction of a carhouse has been started on newly acquired property on St. Jean Avenue.

Separate Industrial and Rate Functions Proposed

In a special message to the Kansas Legislature Governor Allen has recommended taking public utilities from the jurisdiction of the Industrial Court, and creating a new commission to regulate them. A bill to that effect has been introduced, also containing a provision that in utility matters where labor is interested the judges of both courts shall sit *en banc.*

The effect of this would be that in most of the really important utility cases the two courts would join, but the Industrial Court would be relieved from a multitude of small utility matters. A short experience has demonstrated that these minor matters have hampered the efficiency of the Industrial Court, and the law has not had a full opportunity to prove its usefulness.

The Governor feels that the Industrial Court should not be hampered by other functions but should give all its attention to promote continuity of service in industry.

New Orleans Case Urged

General Agitation Begun to Secure Start Toward Basis for Permanent Settlement

George H. Terreberry, recently elected president of the Association of Commerce at New Orleans, La., in a recent address, said that the electric railway problem of New Orleans was one which needed to be settled at once and that he intended the chief work of his administration should be devoted to this end.

Mr. Terreberry was one of the special masters appointed by the judge of the federal district court to settle the strike among the platform men of the New Orleans Railway & Light Company and to reach some solution of the railway problem. He frankly admitted in a talk to the members of the Council, of which body he was chairman for two years, "that nature did not endow him with the talent required for solution of the problem."

From the study which he has made of the matter, however, Mr. Terreberry favors the service-at-cost plan as perhaps the most promising of the schemes advanced for consideration. Any attempt at reaching an understanding must be predicated on capital, labor and the public approaching one another in a spirit of fair play and forbearance. Unless this was done the result, he predicted, would be unavailing. It would mean an end to future investments in utilities in New Orleans.

Excerpts from Mr. Terreberry's address have been reproduced in advertisements in all the New Orleans newspapers in the hope of stilling what Mr. Terreberry calls "the clamor of the stupid and ignorant."

An editorial in the New Orleans *Daily States* of Jan. 26 demands a complete reorganization of the local company. That paper said in part:

> In any attempt to solve the city's transportation, fuel and power problem the thing that ought to be kept in mind is that nothing short of complete reorganization will answer. No makeshifts will meet the situation.
>
> One of the reasons why the company is so frequently compelled to change its operating head is that satisfactory service is out of the question under existing conditions. A superman probably could not render it.
>
> A. L. Kempster came here last year with a high reputation as an operating executive. Others with equally high reputations preceded him, men like Wyman, Pevear, Sloan, Bleecker and others who made successes elsewhere—at times, too, when the conditions were more favorable than they are now. But Mr. Kempster, even with his experience and energy, has not been able to achieve the impossible.
>
> The 8-cent fare ordinance is to be effective only until April. Unless a real move toward reorganization is made before then we shall face a worse condition than ever, for the public protest is sure to gain in volume against a continuance of this excessive fare unless a genuine reorganization is under way.
>
> Such a reorganization ought to contemplate a discharge of the receivership; local control; a valuation of the property which will make its success possible, not one so high as to make failure inevitable; and the investment of capital enough to put the equipment of cars and tracks in a condition to meet the public needs and enlarge the power plant, which has practically reached its capacity, to take care not only of the demands soon to be made on it, but such future demands as a growing city will develop, and to make possible the efficient and economical operation of both systems. All New Orleans asks is good service under reasonable charges.

"Journal of Electricity" Enlarges Its Scope

Enlargement of the editorial scope of the *Journal of Electricity* and a change in its name to *Journal of Electricity and Western Industry* were announced at a dinner on Feb. 1 in the Palace Hotel, San Francisco. The date marked the thirty-fifth anniversary of the *Journal of Electricity*, which has been one of the McGraw-Hill publications since September, 1919. Robert Sibley will continue as editor of the enlarged paper.

The *Journal of Electricity and Western Industry* will be devoted to the upbuilding of the West as an industrial section, and it will interpret Western progress through the application of electric power, light and heat in industries and homes. In its enlarged scope the publication will record the progress of the Far West not only of the electrical industry as such but also of all industry dependent upon electrical energy. The fullest editorial support will be given to financing the huge building programs of the Western electrical utilities in the development of hydro-electric power, as this is held to be the greatest single asset of the West.

Among the hundred guests were included prominent representatives of the utility, banking, irrigation, agricultural and manufacturing interests of the entire West.

News Notes

Franchise Rejected at Akron.—Following the amendments relative to the method of valuation and rate of return the City Council of Akron, Ohio, on Feb. 1 rejected the proposed franchise to the Northern Ohio Traction & Light Company looking toward a settlement of the local railway problem.

No Wage Reduction in Seattle. — The bill recently introduced in the City Council of Seattle, Wash., advocating a 15 per cent cut in the wages of all municipal employees including those of the Municipal Railway effective on March 15, has been killed in the Council by a vote of seven against and one in favor.

Want Service Restored. — The Mayors' Club of Massachusetts, composed of present and former executives of all the cities of the State, will probably ask for restoration of car service in the various communities that have lost this means of transportation. It is stated that consideration is being given to adopting a measure to call the matter to the attention of the Legislature and then to the Department of Public Utilities.

Wants Municipal Bus.—Provision for a city bus line to operate in addition to the electric railway has been proposed as an addition to the home rule charter voted at the last general election by the people of Minneapolis. The amendment is proposed by the Prospect Park Improvement Association alleging that railway service is insufficient. There is now a private bus line operating through Prospect Park between Minneapolis and St. Paul. The fare on this line is 25 cents against 12 cents on street cars.

Restraining Injunction Dismissed.—The Supreme Court of Tennessee has affirmed the decree of the Court of Civil Appeals in affirming the decision of the chancellor in dissolving the injunction and dismissing the case of the Nashville Railway & Light Company against John B. Lawson, labor organizer, against whom the Nashville Railway & Light Company secured a temporary injunction restraining him from organizing the employees of the railway company into a union in violation of their contract with the company.

Home Rule Again the Issue. — The City Council of Minneapolis, Minn., by a vote of eleven to ten opposes the Brooks-Coleman legislative bill planning to place the electric railways in the hands of the State Railroad & Warehouse Commission. By a vote of fourteen to eight the Council has appropriated $3,200 from the current expense fund to pay expenses of the city street railway inspection office. Several months ago the Council refused to do this. It then sought to abolish the office. A league of Minnesota cities which have electric railways was discussed at the third annual meeting of the Mayors on Feb. 7 and 8 in Minneapolis.

Ohio Opposes Coal-Carrying Roads.—Ohio is attracting attention at this time from railroad officials and state utilities commissions and boards because of the determined stand taken by the three members of the Ohio State Public Utilities Commission against the demands of coal-carrying roads traversing the State for the differential rates on coal in addition to the 40 per cent increase in rates granted some time ago. Added interest attaches to the case because of the action by the Interstate Commerce Commission in ruling that intrastate rates for freight and passenger service should enjoy the same increase as had been awarded the roads by the Interstate Commerce Commission on interstate rates.

Names Submitted for Neutral Arbitrator.—In the arbitration case involving the Detroit United Railway and its platform employees, and the question as to the company's right to open the wage reduction question prior to the expiration of the existing contract on May 1, John A. Russel, arbitrator for the railway, has submitted a list of sixteen names to Judge Edward J. Jeffries, the men's representative, with the understanding that the appointment of any of the men named would be agreeable as a third arbitrator. In his letter to Judge Jeffries Mr. Russel urged that the arbitration be arranged for and finished as soon as possible consistent with the deliberation due to the parties represented.

Programs of Meetings

Central Electric Railway Association

The Central Electric Railway Association will hold its annual meeting on Feb. 24 and 25 at the Secor Hotel, Toledo, Ohio. The program includes the annual address of the president, Robert I. Todd; an address by James P. Barnes, president of the Louisville Railway; a paper on the conservation and preservation of line poles, illustrated with a motion picture, by R. R. Cunningham, and a general discussion on "The Future of the Central Electric Railway Association." The meeting on Friday will be devoted to the subject "Traffic and How to Sell Transportation," led by a discussion by Bert Weedon, traffic manager Interstate Public Service Company, Indianapolis, Ind., followed by a paper, "A Freight Traffic Manager's View," by C. O. Sullivan, traffic manager Western Ohio Railway, Lima, Ohio, and a paper, "An Operating View," by L. M. Brown, superintendent of the Interstate Public Service Company, Indianapolis, Ind. This will be followed by a general discussion by the members. The annual report of the secretary-treasurer will be presented and officers for the ensuing year will be elected and installed. A special car will be run from Indianapolis to Toledo. Railway and supply men are invited to join the party.

American Institute of Electrical Engineers

The ninth annual midwinter convention of the American Institute of Electrical Engineers will be held Feb. 16-18, 1921, in the Engineering Societies Building, New York.

The Wednesday evening session will be opened by an address by President A. W. Berresford, followed by the presentation of papers by H. R. Woodrow and Philip Torchio under the auspices of the protective devices committee.

On Thursday morning six papers will be presented, by W. A. Del Mar, Philip Torchio, D. W. Roper, W. S. Clark, H. W. Fisher and L. L. Elden. This session will be under the auspices of the subcommittee on wires and cables of the standards committee.

On Thursday afternoon the telegraphy and telephony committee has arranged for the presentation of two papers.

Friday morning will be occupied by a session arranged by the instruments and measurements committee.

Friday afternoon there will be a session with three papers, by R. E. Doherty and E. T. Williamson, W. Fondiller and W. H. Martin, and Carl J. Fechheimer.

Friday evening will witness the presentation of the Edison Medal to Dr. M. I. Pupin "for his work in mathematical physics and its application to the electrical transmission of intelligence.

Financial and Corporate

Gain Is Negative

Increase in Expenses in New York City Greater Than Increase in Operating Revenue

According to the report of the revenues and expenses of the surface and rapid transit electric railway lines operating in New York City as issued by the Public Service Commission for the First District for the quarter, January to March, 1920, the passenger revenue increased $3,158,000, or 12.2 per cent, over the corresponding 1919 quarter. At the same time the operating expenses increased by $4,152,756, or 21.1 per cent. This made the total expenses $23,870,067 as compared with a total revenue of $31,366,186. The operating ratio was 76.1 per cent. The gross income decreased over 1919 by about 5 per cent. After subtracting interest, rentals, etc., which increased about $890,000, the net corporate income was $1,247,626 short of the 1919 figure.

Although there was a decrease of more than 5,000,000 revenue car miles the total passengers carried increased by more than 18,000,000 persons. Due to the fact that transfers were either not issued or there was a charge of 2 cents for them the total revenue passengers increased by 65,000,000 while the free transfer passengers decreased by nearly 47,000,000. The balancing of these allowed the gain in passengers, as has been mentioned, to be only 3.1 per cent, making a total in 1920 of 609,826,677 persons.

EARNINGS OF NEW YORK CITY COMPANIES

Quarter January-March	1920	1919	Percentage Change Over 1919
Passenger revenue	$29,091,623	$25,933,551	12.2
Other transportation revenue	229,638	159,393	44.1
Total revenue from transportation	$29,321,261	$26,092,944	12.4
Other railway operating revenue	2,044,925	1,620,573	26.2
Total railway operating revenue	$31,366,186	$27,713,517	13.5
Operating expenses:			
Maintenance expended	$6,767,938	$5,514,038	22.8
Depreciation reserve (credit)	197,982	825,404	—76.0
Operation of power plant	4,429,945	3,904,057	13.5
Operation of cars	10,876,403	9,136,684	19.0
Injuries and damages	875,952	1,108,689	—21.0
Traffic and general expenses	1,117,811	879,247	27.1
Total operating expenses	$23,870,067	$19,717,311	21.1
Net operating income	$7,496,119	$7,996,206	— 6.3
Street railway taxes	1,800,201	1,801,912	— 0.01
Operating income	$5,695,918	$6,194,294	— 8.0
Non-operating income	1,192,199	1,050,843	13.5
Gross income	$6,888,117	$7,245,137	— 4.9
Deductions from gross income:			
Interest	$5,650,763	$4,665,997	21.1
Rents	3,671,864	3,998,565	— 8.2
Miscellaneous	686,847	454,306	51.2
Total deductions from gross income	$10,009,474	$9,118,868	9.8
Net corporate income	* $3,121,357	* $1,873,731	61.7

*Deficit.

TRAFFIC AND MISCELLANEOUS STATISTICS OF NEW YORK CITY COMPANIES

Quarter January-March	1920	1919	Percentage Change
Miles of track, exclusive of storage and yard tracks	1,790.62	....	......
Average daily maximum number cars operated (March)	8,293	....	......
Passenger car-miles (active)	80,038,295	....	......
Car-seat miles	4,037,687,843	....	......
Total revenue car-miles	81,879,614	87,365,307	— 6.3
Passenger car-hours	6,810,366	....	......
Ratio C.M. to C.H. (speed m.p.h.)	11.75	....	......
Revenue passengers	580,238,542	522,193,413	11.1
Revenue transfer passengers	7,394,059	....	......
Total revenue passengers	587,632,601	522,193,413	12.5
Free transfer passengers	22,194,076	69,082,333	—67.8
Total all passengers	609,826,677	591,275,746	3.1
Operating ratio (per cent)	76.10	71.06	5.04
Statistics per car-mile:			
Operating revenue (cents)	38.31	31.70	20.8
Operating expenses (cents)	29.14	22.58	29.0
Net income (cents)	*3.81	*2.15	77.2
Number of passengers (total)	7.45	6.77	10.0
Car-miles per revenue passenger	0.140	0.167	— 1.6
Current generated (kw.-hrs.)	356,304,081	337,920,692	5.4

Municipal Road May Be Abandoned

It is reported that the city authorities may discontinue service on the municipally-owned Norton, Taunton & Attleboro Street Railway, Taunton, Mass. Attempt has been made to assess $15,000, or half the purchase price, on the abutting property owners, but the abutters are planning to fight the assessment in the courts. The road is said to be operating at a loss of about $1,000 per month.

Indiana Merger Voted

$3,000,000 in Property to Be Taken Over by Interstate Public Service Company

Stockholders of the Louisville & Southern Indiana Traction Company, the Louisville & Northern Railway & Lighting Company, the Central Indiana Lighting Company, the Bloomington Light & Gas Company, and the Interstate Public Service Company, Indianapolis, met in Indianapolis recently to ratify contracts signed by directors of the various companies for the consummation of negotiations amounting to more than $3,000,000 in property to be taken over by the Interstate Public Service Company according to Ira E. Guthrie, secretary-treasurer of the last named company.

The property of the Louisville & Southern Indiana Traction Company, which consists principally of the interurban line between New Albany and Louisville by way of Jeffersonville, also the local railway systems in New Albany and Jeffersonville, together with the property of the Louisville & Northern Railway & Lighting Company, will be purchased by the Interstate Company for $2,000,000.

The other deals were the acquisition by the Interstate Public Service Company of the property of the Central Indiana Lighting Company, Columbus, Ind., which owns both the light plant and the railway lines in Columbus, and also the light and gas plants in Bloomington, Ind. More than $1,000,000 will be paid by the Interstate Public Service Company for the properties of the Columbus and Bloomington companies.

Service Discontinued at Rockport

The announced purpose of the officials of the Evansville & Ohio Valley Railway to stop running cars on Main Street east of Fifth Street at Rockport, Ind., was put into effect a few days ago. At a meeting of the City Council and representatives of the company with Rockport citizens interested in having the cars continue the run, a determination to refer the matter to the Indiana Public Service Commission was reached. The Council has also received its former order authorizing or petitioning the Public Service Commission to allow this part of the railroad to be removed.

The railway has given the city a bond in the sum of $1,200 to cover the expense of putting the street into good condition after the removal of the track, should the company fail to repair the street. For the present the track remains in the street but the company will not operate cars unless ordered by the Public Service Commission to do so.

Eastern Massachusetts Outlook Better

Platform Labor Costs Have Been Reduced and Many Other Operating Economies Worked—Reduction in Fare Unlikely

The public trustees of the Eastern Massachusetts Street Railway, Boston, Mass., have presented their report for the first eighteen months of public control, ended Nov. 30, 1920. The financial results have been unsatisfactory. The future, however, looks encouraging. Jitney competition, high cost of maintenance, enormous winter loss, increased cost of coal, increased wages and finally a serious business depression have been encountered successively. Even with improved operating efficiency and extreme economy, say the trustees, satisfactory earnings cannot be expected during the present business depression. When business revives, as the trustees believe it must before long, the earnings are expected to improve substantially.

FOR the year ended May 30, 1920, and the six months ended Nov. 30, 1920, earnings and expenses were as follows:

	Twelve Months Ended May 31, 1920	Six Months Ended Nov. 30, 1920
Total revenue and income	$13,471,220	$6,863,861
Expenses:		
Way and structures	$2,106,670	$1,063,108
Equipment	2,008,767	848,369
Power	1,909,722	1,168,413
Conducting transportation	5,230,889	2,295,918
Traffic	17,144	13,906
Injuries and damages	276,569	184,650
Insurance	155,735	71,192
Stores and stable expenses	115,040	80,673
Rent, tracks and equipment	113,313	54,430
Clerical salaries and expenses	256,262	108,495
General and miscellaneous	196,328	119,567
Operating expenses	$12,386,439	$6,008,721
Taxes	323,333	103,394
Operating expenses (including depreciation) and taxes	*$12,709,772	$6,112,115
Gross income	$761,447	$751,745
Interest and rentals	1,484,518	796,904
Interest and rentals not earned by	$723,071	$45,159
Additional amount necessary to meet cost of service	†1,164,747	499,489
Cost of service not earned by	$1,887,818	$544,648

* Includes $750,000 extraordinary snow expense.

Depreciation charges included in operating expenses amounted to $976,862 in the twelve months' period and $574,863 in the six months' period.

† Cost of services includes 6 per cent on valuation established by Public Service Commission of the property operated.

At the outset of public control, the trustees agreed that the railway, in order to regain public confidence, must be put in closer touch with the people. With this end in view, local managers were given increased authority and responsibilities, and committees of citizens were appointed in the various districts, either by the Mayors or Chambers of Commerce, with the power of supervising service and to make recommendations for any improvements which they believed would result in better relations between the car riders and the company.

Control by committees of local citizens has worked out very satisfactorily. These committees give their time and thought to the study of local service problems, without compensation, and through their wide acquaintance and standing in their own communities have been of great assistance in solving numerous traffic problems and creating an atmosphere of mutual understanding between communities and the company, the absence of which in the past caused considerable friction. The trustees, in the light of their experience, are now more than ever convinced that the railway can be much more successfully operated when thus treated than under a long distance control plan when sole authority is vested in Boston executives.

The public control act permits the trustees to charge in each district fares sufficient to earn the cost of service. The cities served are of moderate size, and the experience of the company has proved that every increase in city fares somewhat reduces the number of short-haul riders. Therefore, special rates of fare for daily riders proved desirable. It also has been clearly demonstrated that traffic density and operating costs so vary in different districts that uniform fares are impracticable. The cash fare is 10 cents, but reduced price punch card tickets are sold at rates varying from 6¼ to 8⅓ cents a ride. In Fall River, monthly commutation tickets are also sold at the rate of 6 cents a ride. The use of reduced rate tickets is so general that the average city fare on the system is approximately 8 cents.

When the trustees entered upon their duties there were nearly 1,000 licensed and unlicensed jitneys over-running the territory. The trustees immediately became convinced that the railway and jitneys could not continue to operate in the same community, and the cities and towns affected were persuaded that they could not support both. Until June, 1920, earnings were very seriously reduced by this competition. At the present time there are practically no competing jitneys.

For several years, it was evident that the Bay State System, the predecessor to the Eastern Massachusetts Street Railway, included many miles of road which never should have been built, and other lines which changed conditions and the competition of private automobiles have since made unprofitable. The receiver discontinued 34 miles. The trustees have discontinued 123 miles, leaving 681 miles of single track in operation. The future of the discontinued mileage is uncertain. If the State and the communities served do not consider continued operation of sufficient necessity to warrant public support, the plan is to take up the rails.

Cities and towns are permitted by law to contribute by taxation to avoid discontinuance of railway lines. During 1920, Hingham and Hull agreed to contribute $15,000; Weymouth, $28,000; Tyngsboro, $1,800; North Reading, $2,500; Milton, $10,000, and Norwood and Walpole, $6,000. Gloucester refused to contribute, and since the operation of the Gloucester Division resulted in a loss of $74,000 during the last year, the trustees discontinued service on June 20, 1920.

ONE-MAN CARS PREDOMINATE

In September, 1919, the trustees ordered 200 one-man cars. Delivery was delayed by the severe winter until April, 1920. The cars have been successful from the first. The company now owns 250 of the latest light weight type of one-man cars, which have cost $1,500,000. In addition to these 250 light weight cars the company is operating 280 one-man double truck cars. In December, 1920, 76 per cent of the total car miles operated was by one-man cars. But for the introduction of one-man cars, say the trustees, there is no doubt that a large part of this system, including many city lines, could not earn bare operating expenses and would have to be discontinued.

When the trustees took control in June, 1919, conductors and motormen were being paid 41, 43 and 45 cents an hour. In August, 1919, the War Labor Board increased this rate to 46, 49 and 51 cents, retroactive to June 1, 1919. In Septmber, 1920, a board of arbitration awarded a further increase to 62 and 67 cents, and $400,000 back pay. On the basis of the number of men employed in June, 1919, the increases in wages during trustee control have been at the rate of $1,900,000 a year. Only by one-man cars and a large reduction in miscellaneous employees has this increase been partially offset.

The trustees point out that as costs of other commodities decline car riders naturally will expect to pay reduced car fares, but that as labor cost is by far the largest expense in the operation of an electric railway substantially lower fares will be impossible while wages continue on a war-time basis.

Next to labor costs, the trustees point out, the largest source of expense is coal. In 1920 141,714 tons were consumed on the Bay State System. The average cost of coal delivered in 1915 was $3.25 per ton. The average cost of coal delivered in 1920 was $13.40 per ton. Since April, 1920, the cost of coal has increased at the rate of $700,000 a year. Indications are that there will be a substantial reduction during 1921 in the price of coal at the mine, but coal freight charges today are about $5.80 per ton, or 75 per cent more than the entire cost per ton delivered in 1915.

FREIGHT SERVICE ABANDONED

In May, 1920, it was decided to abandon the freight business. High and increasing cost of rent of terminals, increased wages, motor truck competition, and damage to roadbed by the heavy freight equipment made the business unprofitable. All freight equipment was disposed of to advantage or converted into snow sweepers and snow plows.

The total expenditures for track repair and rehabilitation for the twelve months ended Dec. 31, 1920, were $1,600,000. A summary of the track work done in 1919 and 1920 follows:

	1919	1920
Track, constructed with new rail,	28,900	57,000
Track rebuilt with old rail, ft.	34,600	98,100
Ties replaced	98,273	105,252
Joints welded	856	15,226

With high priced coal, high priced labor, and high priced material, operating economies and lower costs have been difficult to obtain. Only through greater efficiency have savings been possible. The use of one-man cars has reduced platform labor from 15 cents to 10½ cents per car mile. Building and office rents paid have been reduced 70 per cent. Thirteen carhouses have been closed. The Boston organization has been reduced from 245 to 75 employees. On Jan. 1, 1921, the total number of employees was 2,557, compared with 4,836 in January, 1920.

The reorganization plan provided $500,000 as an operating reserve fund, $1,000,000 for rehabilitation, and $2,000,000 for new construction and equipment. The reserve fund was exhausted by the extraordinary 1920 winter expense, and $325,000 of the rehabilitation fund has been expended on track and equipment. The $2,000,000 improvement fund has been entirely expended, $1,500,000 for one-man cars and the balance for snow fighting equipment, track construction, shop alterations and miscellaneous new work.

The physical condition of the entire property has been substantially improved. Probably two more years will be required to bring it up to a high standard.

In accordance with the directions contained in the public control act the trustees, after hearings and conferences with representatives of various communities, created the following operating districts: Lowell, Lawrence, Haverhill, Gloucester, Salem, Lynn, Chelsea, Melrose-Woburn, Hyde Park, Norwood, Quincy, Hingham-Hull, Weymouth, Brockton, Taunton and Fall River.

Each district is operated as if it were a separate railway. Earnings and expenses are accounted for separately and fares are regulated according to the cost of service in each district.

Toledo Lines Segregated

Railway and Lighting and Gas Properties Separated Under New Arrangement at Toledo

The Toledo Railways & Light Company, Toledo, Ohio, at the stroke of 12 o'clock on Jan. 31 ceased to operate the street railways of Toledo and from that time on the railway lines have been operated by the Community Traction Company at a 6-cent fare with a 1-cent charge for transfers.

CAPITALIZATION APPROVED

All arrangements necessary for the new company had been completed with the Secretary of State of Ohio and the Ohio Public Utilities Commission. The handing over of the property to the new company has been approved, together with the capitalization of $10,000,000 of common stock, $2,000,000 of 8 per cent preferred stock, and $8,000,000 of 6 per cent first mortgage bonds.

The common stock of the new company will be deposited with the sinking fund commissioners of the city, and when all the bonds are retired the common stock will become the property of the city, representing the equity of the city in the railway properties, the $8,000,000 in bonds representing the payment by the Community Traction Company for the city electric railway property.

OFFICERS RE-ELECTED

At the annual meeting of the Toledo Railways & Light Company held on Jan. 29 all retiring officers and directors were re-elected. The stockholders voted to accept the service-at-cost franchise ordinance and approved the transfer of the railway properties of the Toledo Railways & Light Company to the Community Traction Company, the new corporation created by the ordinance.

The only railways which the Toledo Railways & Light Company now operates are the Adrian Street Railway and the Toledo, Ottawa Beach & Northern Railway, a summer resort line owning no rolling stock. It will, however, control and continue to operate the power, lighting and heating plants in Toledo.

Frank R. Coates is president and general manager; F. J. Derge, assistant general manager; Henry T. Ledbetter, secretary; A. C. Van Driesen, assistant treasurer; and T. A. Wallace, assistant secretary.

The negotiations between the city and the company which have resulted in the arrangement now in effect have been reviewed from week to week in the ELECTRIC RAILWAY JOURNAL since their inception.

$1,326,072 Net Income for Capital Traction Company

The Capital Traction Company, Washington, D. C., has submitted its annual report for the year just ended. Large increases are shown in its net operating revenue, operating income, gross income and net income. After deducting $305,655 for interest on funded debt, rent for leased road and other miscellaneous debits the company shows a net income of $1,326,072. This was an increase of $212,579 over the same period a year ago. In its profit and loss statement the company shows a credit balance of $693,543, which is an increase of $196,000 over the credit balance of 1919.

SUMMARY OF OPERATIONS OF THE CAPITAL TRACTION COMPANY FOR YEAR ENDED DEC. 31, 1920

		1919	Increase Over 1919
Passenger revenue		$5,435,939	$919,754
Special car revenue		23	51*
Mail revenue		....	170*
Total revenue from transportation		$5,435,962	$919,533
Revenue from operation other than transportation		30,555	11,324
Railway operating revenue		$5,466,517	$930,857
Operating expense (60.30 per cent of gross revenue)		3,302,061	470,902
Net operating revenue		$2,164,456	$459,955
Taxes assignable to railway operations		541,727	228,393
Operating income		$1,622,729	$231,562
Non-operating income		8,999	3,942*
Gross income		$1,631,728	$227,620
Deductions from Gross Income:			
Interest on funded debt	$280,300		
Interest on unfunded debt	10,716		
License trackage space	1,200		
Rent for leased road	9,533		
Miscellaneous debits	3,905		
Total deductions		305,655	15,039
Net income		$1,326,073	$212,581

* Decrease.

PROFIT AND LOSS STATEMENT

Credit:			
Balance beginning of year	$497,355		
Net income for year	1,326,072	1,823,427	
Debits:			
Dividends	$720,000		
Loss on real estate sold and equipment retired	409,660		
Loss on material sold	71		
Uncollectible accounts written off	152	1,129,883	
Credit balance at close of year		$693,544	$196,188

Replacement Value Expected to Guide New Body

In commenting on the prospect of a valuation of the transit lines in New York under the program of Governor Miller the *Wall Street Journal* of Feb. 8 said in part:

> It is evident that the replacement value of Interborough's properties is now far in excess of its outstanding securities, whatever watering may have accompanied their issuance.
>
> Precedent for a revaluation of the rapid transit lines on a basis of reproduction cost has been set by a decision of a Missouri federal court in the case of St. Joseph Railway, Light, Heat & Power Company. This ruling, which is expected to guide the commission Governor Miller proposes to appoint for an investigation of the local fare problem, declared that it was confiscatory to determine traction rates on a valuation based on the original cost. "No one can say what degree of depression may ultimately come," the decree read, "but it is reasonably certain that the cost of the properties now under consideration will never again approximate figures prevailing in the years before the world war."
>
> It is just as certain that a fair appraisal of the present cost of replacing Interborough's investment would greatly exceed the amount of securities outstanding, some authorities placing the increase that would be shown over the original cost so high as 100 per cent. Taken in this light continuation of a fare which does not even yield fixed charges on Interborough's pre-war investment can only be considered, in the words of the court, as "inadequate and practically confiscatory."

The decision in the so-called St. Joseph case was referred to at length in the ELECTRIC RAILWAY JOURNAL for Nov. 27, page 1122.

Interurban Purchase Suggested

Purchase of the interurban line of the Columbus, New Albany & Johnstown Traction Company is contemplated by the Columbus Railway, Power & Light Company, of Columbus, Ohio, as one probable quick solution of the demand of the city that service be extended to the suburb of Shepard. If the company succeeds in buying the Columbus, New Albany & Johnstown line, it will be able to make plans immediately for the extension. To date the matter is still one of conjecture, with progress suspended, so far as the city is concerned. Further conferences are, however, being arranged.

The Columbus Railway, Power & Light Company, announced its willingness last summer to take advantge of an opportunity afforded at that time to purchase certain interurban lines, but the interurban companies opposed the proposal, and the matter was dropped.

Pratt Street Station, Baltimore, Sold by Railway

A contract has been entered into between the United Railways & Electric Company, Baltimore, Md., and the Consolidated Gas, Electric Light & Power Company of the same city by which the Pratt Street power station of the former company is sold to the latter company, which hereafter will supply the power for the operation of the cars of the United Railways & Electric Company. The price at which the power station is said to have changed hands is $4,000,000.

It is expected that owing to the diversity factor the lighting and power company can supply energy in the future to the railway at less than the latter could generate it. In fact, the contract provides that the cost will be no more than that now paid to the lighting company for current taken in the past and of any saving made one-third will be paid to the railway.

The power contract is for five years but is automatically renewable. Another clause provides that at any time, if the contract or any part of it results in serious injustice to any of the parties thereto and an equitable distribution of the benefit is not obtained, the terms may be readjusted by arbitration.

71,768,440 Revenue Passengers in St. Louis in Three Months

The United Railways, St. Louis, Mo., has filed its quarterly report with the City Register of St. Louis, covering the final quarter of the year 1920. The report gives the average number of cars run daily and Sunday, the total number of revenue passengers of all descriptions and the average number of trips made daily and Sunday. The report is as follows:

Trips	1,614,616
Miles	10,510,026

Fare Passengers Carried

3,974	7½ cent
70,133,210	7 cent
1 102	3½ cent
1,629,300	3 cent
854	2½ cent
71,768,400	

The average number of cars operated was as follows:

Average per weekday	1,321.5
Average per Saturday	1,224.9
Average per Sunday	699.0
Final average	1,207.0

The average number of trips made per week was as follows:

Weekdays	85,897
Saturdays	14,699
Sundays	10,486
Total	111,082

Brooklyn Receiver Reports

Lindley M. Garrison, receiver of the Brooklyn (N. Y.) Rapid Transit Company, filed with Judge Mayer of the District Court of the United States for the Southern District of New York on Feb. 8 a report of 120 pages on the affairs of the various companies involved in the receivership and sought instructions with respect to the report.

In general the receiver says that the transportation problem in Brooklyn should be treated as a whole, but that under existing conditions there is no centralizing authority capable of treating the situation as an entity. While it is not suggested that the court can deal adequately with the question presented to it, it is nevertheless important in the opinion of the receiver for the court to consider the necessities of the situation as a whole with a view to meeting them as fully as the existing law permits.

Financial News Notes

Two New Directors at Detroit.—C. R. Nutt, Cleveland, Ohio, and Charles Laurondau, Montreal, Que., have been elected directors of the Detroit (Mich.) United Railways, succeeding B. M. Swift and Alonzo Potter.

Merger Bill Reported Favorably.—While a bill has been reported favorably to the House of Representatives taking the initial step toward consolidating the Washington Railway & Electric Company and the Capital Traction Company in Washington, there is said to be little chance that action will be taken before Congress adjourns on March 4.

Time for Deposits Extended.—The protective committee, representing the holders of the first mortgage 5 per cent bonds of the Columbus, Buckeye Lake & Newark Traction Company, Newark, Ohio, due in 1921, has announced that the time for the deposit of the bonds under the protective agreement of Nov. 10, 1920, has been extended to April 1, 1921.

Notes of Baltimore Company Offered.—A syndicate of bankers headed by Alexander Brown & Sons, Baltimore, Md., offered for subscription on Jan. 17 an issue of $1,500,000 of 7½ per cent five-year collateral trust notes of the United Railways & Electric Company, Baltimore, Md. The proceeds of the notes were used in part to pay off notes which matured on Feb. 1.

Receivership Made Permanent.—The temporary receivership under which the Alton, Granite City & St. Louis Traction Company, East St. Louis, Ill., has been operating for the last four months, has been made permanent by Federal Judge English at East St. Louis. The appointment of W. H. Sawyer and Frederick Allen as temporary receivers and C. B. Thomas as their counsel has also been made permanent.

Interest Paid Promptly.—The City & Suburban Railway, Washington, D. C., deposited with the Baltimore Trust Company, trustee, funds to meet the semi-annual interest due on Feb. 1, on the $1,750,000 of first mortgage 5 per cent bonds. At the last two interest paying periods on these bonds the company took advantage of its ninety-day clause in the mortgage before meeting payment on the securities.

Court Authorizes Abandonment. — Supreme Court Justice Morschauser has directed Receiver Miller, of the Westchester Street Railway, Mount Vernon, N. Y., to abandon operations on the mile and a half Shore line route from Mamaroneck to Larchmont as the receiver has reported that the company was losing $35 to $40 a day on that line. The action was taken in the face of an order of the Public Service Commission for the Second District of New York directing Receiver Miller to run the road.

Foreign Corporations to Be Prohibited.—Harold A. Moise, elected delegate to the Constitutional Convention, from New Orleans, La., to meet in Baton Rouge early in March for the purpose of revising the organic laws of the State, gives notice that he purposes to introduce a measure requiring all companies operating public utilities to incorporate under the law of the State and making it prohibitive for foreign companies to own or operate public utilities or in any way exercise control over them. The proposed new law is directed primarily at the New Orleans Railway & Light Company and affiliated companies, but its effect necessarily will be statewide.

Notes of Oklahoma Railway Offered.—The Mississippi Valley Trust Company, St. Louis, Mo., is offering at 98 and interest to yield 8.35 per cent $450,000 of bond-secured 8 per cent gold notes of the Oklahoma (Okla.) Railway. The notes are dated Jan. 1, 1921, and are due Jan. 1, 1928. The notes are secured by the deposit of $680,000 of first and refunding mortgage 5 per cent bonds, $120,000 of Guthrie Railway first mortgage 5 per cent bonds and $500,000 of Guthrie-Edmond Electric Railway first mortgage 5 per cent bonds. They are convertible into first and refunding mortgage bonds at the rate of 80 or $5,000 of bonds for $4,000 of notes.

$600,000 Due for Taxes.—The illness of City Attorney Kittredge has delayed the preparation of the intervention to the receivership in the Federal Court which the city intends to file against the New Orleans Railway & Light Company for the collection of approximately $600,000 due for the 1920 taxes now delinquent. There is a penalty of 10 per cent attached to the delay in making the payments for which the company will be held accountable. The receiver has offered to pay its indebtedness to the city in three payments, declaring that it is without funds to discharge itself of the debt in one lump sum. This privilege has been denied on the grounds that the company stands in the same light as any other taxpayer.

Interborough Accounts Questioned.—Transit Construction Commissioner Delaney has filed objections to reports of the Interborough Rapid Transit Company, New York, containing extraordinary charges for promotion of higher fares, for publicity generally for strike and financial investigations and for legal advice, said to have been improperly reported in operating expenses, amounting in all to $423,000. Frank Hedley, president of the company, has explained that the contract between the city and the company provides a method of adjudication by arbitration of all disputed items, and that in due course the items in question will be considered by orderly process.

Operating Lease Made at Dallas.—Contracts for lease and operation of the Standard Traction Company's Mount-Auburn-Parkview lines in the city of Dallas, Tex., by the Dallas Railway and for the construction of a passing switch on Beacon Street have been approved by the City Commission of Dallas. The Dallas Railway will have free use of the lines of the Standard, will receive all fares collected and will bear the cost of the passing switch. Through service will be maintained from the down-town section to the ends of the lines, and it will be no longer necessary to maintain transfer points in the city's suburbs as has been the case.

Readjustment of Capital Proposed.—The Kansas City, Clay County & St. Joseph Railway, St. Joseph, Mo., has filed with the Public Service Commission of Missouri a request for authority to issue $6,000,000 of 7 per cent cumulative preferred stock and $4,000,000 of common stock. In October the company obtained authority from the commission to reissue its capital stock of $10,000,000, of which $3,000,000 was to be preferred and $7,000,000 common. It sought to amend the articles of incorporation later, but the Secretary of State would not permit it to do so because all of the holders of the preferred stock had not given their consent. The company proposes to dissolve as a Maine corporation.

$300,000 of Notes for Improvements.—The issuance of $300,000 in notes for the purpose of purchasing equipment and rolling stock and making other improvements has been authorized by the board of directors of the Utah-Idaho Central Railroad, operating an electric line between Ogden, Utah, and Preston, Idaho. The greater part of the money will be used in the purchase of freight cars for the purpose of taking care of increase in the livestock and sugar beet business of the towns along the line of the road. The expenditure for the improvements will be made at once by the company. In fact, 100 new steel gondola cars have been purchased from a car manufacturer at Columbus, Ohio, and will be delivered to the electric line within the next two months.

Ancient of Days.—Three memberships in the Merchants' Exchange of St. Louis, acquired by independent street railway lines to permit their representatives to buy feed on exchange for the horses and mules that used to pull the cars, have been retained by the United Railways since the merger of the independent lines in 1900. The memberships cost $100 a year, so that the United Railways has paid $6,000 in twenty years without any beneficial return, a fact which Receiver Wells noted in an application to the Federal court for authority to sell the memberships. Their usefulness long since has passed away, according to Mr. Wells, who states that he believes he can obtain $1,000 each for the memberships. An order for their sale was immediately issued by Judge Faris.

Extension of Time for Discontinuance.—Justice Charles H. Brown, in the Supreme Court of Erie County, has granted an order extending until March 31 the time within which George Bullock, as receiver for the Buffalo & Lake Erie Traction Company, Buffalo, may discontinue operations of the road along the lake shore between Buffalo and the Pennsylvania state line, except that part of the line formerly owned by the Hamburg Railway, Buffalo. The original date for discontinuing service was Jan. 31. The application for an extension of time was made by the receiver, who informed the court he wished to determine the extent the revenue of the company would be increased by reason of the recent advance in the rates of fare between points on the interurban line. It is within the power of the receiver to discontinue service on March 31 and negotiate for a purchaser of the property before that time.

Wants Valuation Law Amended.—In accordance with resolutions adopted by the League of Municipalities at its annual convention Ledley H. Phinney, executive secretary, has sent letters to all members of the Senate, urging support for Senator Parry's bill, No. 13, amending the act of last year relative to the appraisal of electric railway property in the State of New Jersey and also urging that some steps be taken to break the present deadlock over the confirmation of public utilities commissioners. The Parry bill is now before the corporations committee. The valuation law provides that the report of the engineers must be submitted by March 1, but it is understood that the firm of Ford, Bacon & Davis, which is doing the work, has nearly completed the valuation of the Public Service Railway and will be able to turn over the figures to the Valuation Commission at an earlier date than that required by the law.

Stock Sold to Provide for Improvement.—The Public Service Company, San Antonio, Tex., has announced plans for the issuance of additional stock in accordance with an amendment to its charter filed in the office of the Secretary of State at Austin providing for the creation of $2,000,000 of preferred stock and by raising the amount of common stock from $4,700,000 to $5,000,000. W. B. Tuttle, vice-president and general manager, announced that $100,000 of the issue of common stock had been subscribed before the amendment was filed, leaving only $200,000 additional common stock to be sold. The proceeds from the stock, both preferred and common, will be used to keep pace with the growth of the city. Heretofore money needed for improvements and betterments has been raised by the issuance of bonds paying an annual interest rate of 5 per cent. This year it was deemed advisable to issue additional stock and to enroll among the stockholders of the company as many citizens of San Antonio as was found possible.

Traffic and Transportation

Main Street—Paterson

Complete Rerouting of Jitneys and Trolley Cars Suggested—Every Phase of Traffic Covered

The city of Paterson, N. J., has just received from John A. Beeler, consulting engineer, New York, an exhaustive study of traffic conditions in that city together with suggested remedies for betterment of the existing congestion. The report is in two sections, the first deals with the problem from the viewpoint of municipal regulation of vehicular traffic other than the trolley car, and the second takes up the contribution of the trolley cars to traffic congestion and the remedies that are suggested for the consideration of the Public Service Railway.

In dealing with the jitney bus topic, Mr. Beeler suggests that all jitneys be eliminated from the main streets by establishing terminal loops.

In handling the trolley situation, Mr. Beeler suggests the elimination entirely of the loop lines and the making of through lines of the strictly local car routes. He would make the interurban lines express lines with stops after leaving the center of the city, at intervals averaging about 1,200 ft.

Altogether the changes suggested are voluminous, so far as the rerouting of the trolley cars is concerned, but are of a nature not likely to meet with insurmountable objections. It may be said that the remedies proposed by Mr. Beeler are rather drastic, but then the problem is a difficult one, and its solution depends upon getting as much traffic as possible out of Main Street, a very narrow thoroughfare. To remove the trolley cars from Main Street would mean great expense in laying new tracks, repaving streets, and perhaps cutting through new thoroughfares, and, after all, the trolleys were there first. Mr. Beeler sums up the Paterson situation in the following paragraphs:

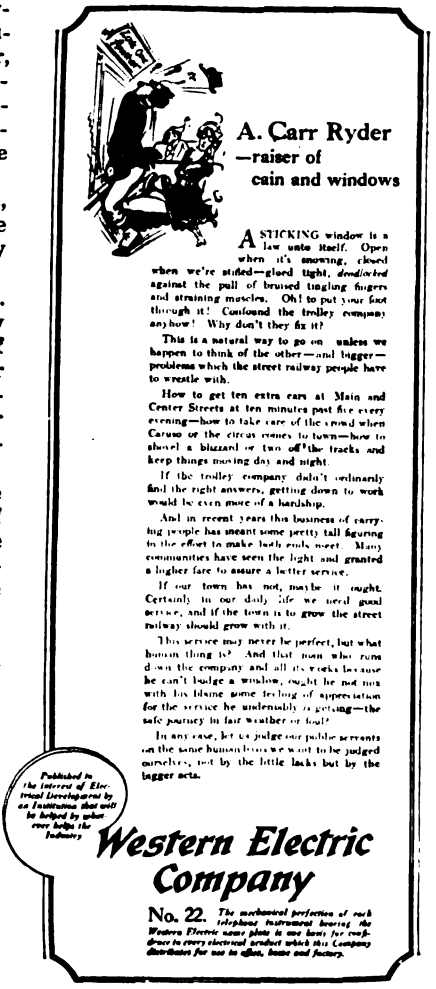
> The traffic difficulties are due to a number of causes. Chief among these are the physical layout of the city and its narrow streets, the street car routing, also fare collection, location of street car stops, the tremendous growth of automobiles, jitney and truck traffic, and vehicle.
>
> The fact that vehicular traffic centers on Main Street has made this the focus of the congestion.

Rerouting Plans in New Orleans

A tentative plan for the rerouting and relooping of cars in the business section of New Orleans, La., has been announced by Stanely Ray, commissioner of public safety. The system which has been gone over very carefully by Public Utilities Commissioner Maloney has the sanction of the New Orleans Railway & Light Company. The proposed scheme, which will eliminate congestion and so reduce delays, will affect about seventeen lines, changing sixteen and eliminating one. Certain business district streets running parallel with the river will be designated as one-way streets.

Judge by the Acts, Not the Lacks

The accompanying illustration was published by the Western Electric Company in a recent issue of the *Literary Digest* and will appear in the February 26 number of *Collier's*. In the interest of electrical achievement the Western Electric Company carried on a similar advertising campaign last year. The advertisement shows the attitude of the average car rider when a detail in service falls below the 100 per cent mark. The electric railways, after all, are only a human agency. The idea behind the ad is that the 2,350,000 subscribers to the *Literary Digest* and to *Collier's* will learn the lesson contained herein and "judge public servants not by the little lacks but by the bigger acts."



A. Carr Ryder
—raiser of cain and windows

A STICKING window is a law unto itself. Open when it's snowing, closed when we're stifled—glued tight, *deadlocked* against the pull of bruised tingling fingers and straining muscles. Oh! to put your foot through it! Confound the trolley company anyhow! Why don't they fix it?

This is a natural way to go on unless we happen to think of the other—and bigger—problems which the street railway people have to wrestle with.

How to get ten extra cars at Main and Center Streets at ten minutes past five every evening—how to take care of the crowd when Caruso or the circus comes to town—how to shovel a blizzard or two off the tracks and keep things moving day and night.

If the trolley company didn't ordinarily find the right answers, getting down to work would be even more of a hardship.

And in recent years this business of carrying people has meant some pretty tall figuring in the effort to make both ends meet. Many communities have seen the light and granted a higher fare to assure a better service.

If our town has not, maybe it ought. Certainly in our daily life we need good service, and if the town is to grow the street railway should grow with it.

This service may never be perfect, but what human thing is? And that man who runs down the company and all its works because he can't budge a window, ought he not mix with his blame some feeling of appreciation for the service he undeniably is getting—the safe journey in fair weather or foul?

In any case, let us judge our public servants on the same human basis we want to be judged ourselves, not by the little lacks but by the bigger acts.

Published in the interest of Electrical Development by an Institution that will be helped by whatever helps the Industry

Western Electric Company

No. 22. *The mechanical perfection of each telephone instrument bearing the Western Electric name plate is one basis for confidence in every electrical product which this Company distributes for use in office, home and factory.*

FAIR-PLAY APPEAL IN THE MAGAZINES

Freight Terminals a Problem

New Stations May Be Erected by the Interurbans Now Entering Indianapolis

As a result of the suggestions of the Public Service Commission of Indiana in connection with their recent order covering additional fare increase for the Indianapolis Street Railway the interurban lines entering Indianapolis have held conferences seeking to improve the interurban freight terminals at Indianapolis. It is possible that new freight stations may be established at the Kentucky Avenue and South Street terminal of the Terre Haute, Indianapolis & Eastern Traction Company, This would relieve the congestion at the freight house located in the heart of the city at the Traction Terminal Station.

The Terre Haute, Indianapolis & Eastern Traction Company already has a large freight house on the Kentucky Avenue property and should additional buildings be erected at this point the freight stations adjoining the Traction Terminal building would probably be used for handling express or dispatch freight.

In the conferences held to consider these matters, the Indianapolis Street Railway, which holds contracts with the interurban companies for power, use of tracks and freight terminals, has proposed to cancel the freight provision from the existing contracts between the city company and the interurban companies and to surrender its lease of the Kentucky Avenue freight terminal so that it would be available for all of the interurban companies for such part of their freight business as would relieve the congestion at the present freight house at the Traction Terminal Station.

A question has, however, been raised by the city of Indianapolis as to various provisions of existing contracts and the charges made by the Indianapolis Street Railway to the Interurban lines using its property in Indianapolis. It has, therefore, been suggested by the Indianapolis Street Railway to submit to the Public Service Commission of Indiana the question as to the extent and character of the suggested modifications to be made to existing contracts, so that all interests may be protected. A hearing on this matter was held on Jan. 31.

Court Upholds Commission

The Court of Appeals of New York affirmed, with costs, on Feb. 1 the order in the action of the People ex rel. New York, Westchester & Boston Railway against the Public Service Commission, First District, and decided that the commission had the right to increase above the 5-cent maximum the rate of fare prescribed in the agreement between the city of New York and the railroad.

Judges Hogan and Pound held against the right to increase fare, but Chief Judge Hiscock and Judges Cardozo, McLaughlin, Crane and Andrews decided the question.

To the question, "Is a railroad of the New York, Westchester & Boston Railway a 'street railroad,' within the meaning of Section 18 of Article III. of the Constitution of the State?" the court answered in the negative.

The First Appellate Division held that the commission had jurisdiction to authorize the company to charge a higher rate of fare than that prescribed by the ordinance, provided the rate so prescribed was found by the commission to be insufficient to give the company reasonable compensation for the service rendered, and that the commission was authorized to fix a just and reasonable rate of fare.

Additional Recommendations by Peter Witt at Trenton

The City Commission of Trenton, N. J., has again engaged the services of Peter Witt, Cleveland, to advise it in connection with the problems of the Trenton & Mercer County Traction Corporation, Trenton, N. J. Three years ago Mr. Witt urged the purchase of at least fifty one-man cars. Sixty cars were afterward purchased at a cost of between $350,000 and $400,000, but they have not met with popular favor.

Mr. Witt says he approves of one-man cars, but objects, however, to the narrowness of the platform of the cars used in Trenton. He claims the Trenton company did not purchase the type he suggested. Mr. Witt declares the one-man cars are by far the safest in this section. He stated that the rule in Cleveland was for an operator colliding with another car to consider himself discharged at the end of the run. In his opinion if such a rule was put into effect in Trenton there would be fewer accidents.

Mr. Witt left Trenton on Jan. 28. He suggested that the railway follow out the recommendations made by him when he visited Trenton the first time at the request of the City Commission. Among the plans advocated by him for the betterment of the service were the placing of seats in a longitudinal manner in the one-man cars and the diverting of auto and other traffic from the center of the city during the rush hours.

Non-Rush Hour Service Reduced in Milwaukee

Announcement has been made that the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has increased the headway on eight of its city lines during non-rush hours from one to three minutes. Decreased riding, due to the industrial depression and the mild winter which has permitted the uninterrupted operation of automobiles, is given as the cause for the revision in schedules. The change had the approval of the Milwaukee representative of the Wisconsin Railroad Commission, since the revised schedules would still be above the minimum fixed by the commission. Incidentally, the statement has been made by Superintendent of Transportation Kuemmerlein of the company that the month just ended is the first January in his twenty-six years with the company that it has not been necessary to use a snow plow or sweeper in Milwaukee.

States' Rate Power Overruled

The Michigan Public Utilities Commission has been permanently restrained by the federal court sitting at Detroit from reducing railroad passenger rates from 3 to 2½ cents a mile within the State. The order was issued on application of thirteen Michigan roads. The case was regarded as a test of authority between the State and the Federal government. There is a "twilight zone" between war and peace, said the court's opinion, in which the Federal Congress has the right to fix fares to aid national reconstruction.

State passenger fares in Iowa must be raised to the same level as those prevailing in interstate commerce, the Interstate Commerce Commission ruled on Jan. 24. It said present rates discriminated against the interstate rates.

The commission said that the Iowa case was similar in many respects to the New York and Wisconsin cases on which similar rulings were made. The fares involved, which are to be raised on or before March 1, include a 20 per cent increase in passenger fares.

Double Fare Charge Affirmed

The decision of the Appellate Division that the Brooklyn (N. Y.) City Railroad had the right to charge two fares on the Flatbush Avenue line was affirmed on Feb. 4 by the Court of Appeals. No opinion was written. An order of the Public Service Commission directing the company to cease making the double charge was reversed.

Vincent Victory, assistant to Corporation Counsel John P. O'Brien, who had charge of the case, said:

> The decision is important because it may open the way for double fares on many of the surface lines in Brooklyn which claim the right to charge one fare under a franchise granted in one of the old towns and another fare under a franchise granted by another town.

The Brooklyn City Railroad through its counsel appeared recently before Deputy Public Service Commissioner Morgan T. Donnelly for permission to charge 10-cent fares on the Broadway-Cypress Hills, the Smith Street and Franklin Avenue lines to Coney Island and the Wilson Avenue line from Delancey Street to Canarsie. Counsel argued that the railway was well within its rights in charging an additional 5-cent fare to Coney Island south of the Brooklyn Park Circle. This point is near what was once the dividing line between the old City of Brooklyn and Flatbush. It is claimed that the line south of Park Circle was originally run on a steam railroad franchise which permitted the charge of 3 cents a mile. A public hearing will be held by the commission on Feb. 18.

Transportation News Notes

Tokens in Duluth. — The Duluth (Minn.) Street Railway is now using metal tokens in place of strip tickets. The tokens are sold in lots of fifty for $2.50. The cash fare is 5 cents.

North Shore Line Asks for Three Cents a Mile.—At a recent hearing before the Interstate Commerce Commission the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., petitioned for an increase in passenger rates to basis of 3 cents a mile. At present the rate in Illinois is 2 cents a mile, while it is 2.7 cents in Wisconsin.

Will Fight Fare Increase.—The City Councils of Gadsden and Attalla, Ala., have voted against an increase in fares asked by the Alabama Power Company. Representatives of the two communities will be sent to Montgomery to contest the application of the company now before the State Public Service Commission.

Would Charge Six Cents.—The Texas Electric Railway, Dallas, Tex., has filed with the City Commission of Sherman an application for permission to charge a six-cent fare on its lines in that city. The present fare is 5 cents. The company states that unless an increased fare is granted service will have to be curtailed.

Two-Man Rule at Issue.—The city of Durham, N. C., has brought suit to compel the Durham Traction Company to operate its cars with two men at all hours. An ordinance passed some time ago instructed the company to place two men on all cars. The result of the order was two-man operation during rush hours. Complete two-man operation is demanded.

All Skip Stops to Go.—The Northern Texas Traction Company, Fort Worth, Tex., will abolish the skip-stop plan of operation, which has been retained on its Fort Worth lines since the war, according to an announcement by George H. Clifford, vice-president and general manager. Skip-stops were abandoned on Jan. 1 last on all of the lines except those located in the downtown section.

Three Cents a Mile on Interurban.—The Winona Interurban Railway, Warsaw, Ind., is now charging at the rate of 3 cents a mile on its interurban lines. This rate has been in effect for some time. In the issue of Jan. 15, page 158, it was indicated that the company had only just filed a petition for an increase to the 3-cent basis. The railway connects Warsaw, Leesburg, Milford, Goshen and other Indiana towns.

Indiana Fliers Named.—From a list of more than 2,000 suggestions th

Indiana Service Corporation has selected the names of "Wabash Valley Flier" and "Hoosierland" for its two new fast trains which are now running between Fort Wayne and Indianapolis. Prizes of $15 for the best names and $10 for the second best names were offered. The trains have been heavily patronized since being put into operation.

"Oncinawile" in East St. Louis.—Not for ever and ever nor for all of the time but only "Oncinawile" will the East St. Louis & Suburban Railway employees issue their new pamphlet giving inside facts on the doings of this Illinois Railway. The editor of the new publication states that stories, personal ones, too, will be accepted. No sermonizing in stories is permitted. All such material will be for the reign of Blue Sundays.

Safety Zones in Indianapolis.—The Board of Safety of Indianapolis, Ind., has decided to establish triangular safety zones at the north intersection of Meridian Street and the Circle, extending north in Meridian Street to the sidewalk line of the Circle and east and west in the Circle to the sidewalk lines of Meridian Street. This will prevent pedestrians from crossing the intersection except in direct line with the sidewalk.

Washington Fares a Problem. — The present rate of fare in Washington, D. C., of 8 cents cash or four tokens for 30 cents expires on March 31. This will necessitate action on the part of the Public Utilities Commission before that date as the old 5-cent rate would become effective automatically on April 1. Since costs of operation have not declined since the 8-cent fare was authorized, it is anticipated that the present schedule on the lines of the Washington Railway & Electric Company and the Capital Traction Company will be maintained until Congress takes action during the extra session.

"Knocking Down" Brings Heavy Fine.—Judge Marshall, in the Mercer County Criminal Court, recently imposed a fine of $200 and costs upon a conductor in the employ of the Trenton & Mercer County Traction Corporation, Trenton, N. J., who was convicted of "knocking down" fares. The trolleyman failed to register thirty-seven fares which he collected on the East Trenton Division. The court in imposing the heavy sentence said it was going to break up the practice of well-paid employees stealing money from the traction company. More conductors are awaiting trial for a similar offence.

Loading Platforms in Pittsburgh.—A number of loading platforms have been put in operation for the convenience and safety of riders by the receivers of the Pittsburgh Railways. More will be installed as soon as arrangements can be completed. The platforms, of wood, are about 70 ft. long and 3 ft. wide and are designed to safeguard those boarding and alighting from cars. Traffic rules require automobiles and other vehicular traffic to pass around the back of the railway loading platform which is guarded with iron railings. Charles A. Fagan, S. L. Tone and W. D. George, receivers of the company, have expressed satisfaction with the platforms and announced others will be installed.

McKinney Fare Rise Under Consideration. — The Texas Electric Railway, McKinney, Tex., has requested the City Council of that city for authority to increase local fares from 5 cents to 6 cents. In reply, Mayor Finch notified the company that the city has no authority under the franchise granted to regulate the rate of fare to be charged. The city authorities also notified the traction company that extensions of service in McKinney were not needed but the construction of a line to the McKinney Junior College was desired. No action has been taken on either the fare request or the extension of lines.

Hearing on Louisville Petition.—The injunction proceedings of the Louisville (Ky.) Railway for the purpose of preventing the city administration from interfering in any way with the proposed plan of increasing fares to 7 cents, was to come up in the United States District Court of Judge Walter Evans, on Feb. 10. Following the filing of the suit the company inserted car cards in its cars reading: "Our case is in the courts because we believe the establishment of our rights will enable us: First, to maintain efficient service; second, to maintain reasonable wages for our employees; third, to pay a fair return to our investors."

Suburban Line Asks Dime Fare.—The Port Jervis (N. Y.) Traction Company has made application to the Public Service Commission, Second District, for authority to charge a 10-cent fare from any point on its line in the town of Deer Park to any point in the city of Port Jervis. The company will maintain its 7-cent fare in Deer Park Township and in Port Jervis. The company alleges that its outstanding bonded debt is $70,000, upon which no interest has been paid since 1914, and that for the last three years the company has not been able to earn sufficient money to pay its operating charges and taxes and that for the years 1913-1919, inclusive, its total deficit is $24,169.

Bus Merger Under Consideration.—Protests have been made before the State Public Utilities Commission of Utah by certain drivers of automobile stages between Salt Lake City and Bingham, against becoming part of a company to be incorporated under the Utah law for the purpose of conducting the stage line. Owing to lack of unity in the stage line, the commission had recommended that it be centralized into an incorporation. The drivers prior to this move had been driving independently and getting a large precentage of what they took in. They object to having their equipment merged into a company. The Utilities Commission has not receded from its position that the business should be centralized. The matter, however, is still under advisement by the commission.

Muskogee Car Order Modified.—The Corporation Commission has granted the application of the Muskogee Electric Traction company for modification of the order of Sept. 2, 1920, granting increased fares. The order provided that 50 per cent of the net revenues from the operation of the company's lines be used for improvement of physical property and service. Company and city officials stated in testimony before the commission that the agreement between the city and company was that 50 per cent of the net profits "received from the operation of the company's lines due to the increased fares" should be utilized for improvements of the property and service. The company asked for modification of the order to comply with this agreement and the application was granted by the commission.

Eight-Cent Fare Stands.—An 8-cent cash fare with four tickets for 25 cents will continue to be collected on the McKeesport (Pa.) lines of the West Penn Railways, Pittsburgh, under the terms of a recent order of the State Public Service Commission. The fare was raised from 5 cents to 8 cents last August. The commission holds in abeyance a complaint of the city of McKeesport and orders that the company continue the new fares for one year, during which time a complete statement of the operating expenses and revenues is to be filed with the commission. The commission also reserves the right for future action on the complaint of service, which the order says patrons of the McKeesport Division can expect to be improved under the new trolley fares. In the opinion the commission indicates that it does not believe that operating costs will continue to increase and that a reduction in fares should be made with the lowering of operating costs.

Will Charge 2.7 Cents a Mile.—The Northern Texas Traction Company, Fort Worth, Tex., has announced a flat increase in fares on its interurban lines between Dallas and Fort Worth, Fort Worth and Cleburne and all intermediate points. The advance in rates will amount to approximately 33⅓ per cent. The new fares will be based on a rate of 2.7 cents a mile. The minimum charge will be 12 cents instead of 5 cents as heretofore. Between Dallas and Fort Worth the new fare will be $1 for one-way passage, or $1.80 for round trip, against 76 cents for one-way passage or $1.35 for round-trip passage under the old rate. George H. Clifford, vice-president and general manager, in announcing the increase stated that the company plans extensive improvements. Four large interurban cars will be ordered at once, and other cars now in service will be overhauled. Improvements will also be made in the roadway and in depot and station facilities. The double track of the Dallas-Fort Worth line will be extended and the number of cars in service on this line will be increased.

Personal Mention

Mr. Gale Honored

Operating Head, Hull Electric Company, Chosen President of the Canadian Association

Meeting at Ottawa, Ont., on Jan. 31 and Feb. 1 the Canadian Electric Railway Association elected as its president for the ensuing year G. Gordon Gale, vice-president and general manager, Hull (Que.) Electric Company. During the past year Mr. Gale has served as vice-president of the association. He has also been a member of the executive committee for several years.

An experience of fifteen years as a railway operator has qualified Mr. Gale to undertake the duties of president of the association. The Hull Electric Company, of which he has been in charge as general manager since 1914, serves a community of more than 30,000 persons. It controls and operates an electric line 30 miles in length connecting Ottawa, Hull and Aylmer, and furnishes power for lighting in several communities.

G. G. GALE

Mr. Gale is a graduate of the electrical engineering department of McGill University. Prior to 1907 he was assistant engineer of the electrical plant of the Canadian Rubber Company. In that year he became superintendent of the Hull Electric Company. In the fall of 1908 he was made acting general superintendent of the company, and a year later was advanced to general superintendent. Five years later he was given the title of manager, and, in 1917, he assumed his present position as vice-president and general manager.

Civic and association duties have for several years occupied much of Mr. Gale's attention. He is a member of Council and past chairman of the Ottawa branch of the Engineering Institute of Canada. He is also an associate member of the Institution of Electrical Engineers of Great Britain and of the Canadian Society of Civil Engineers.

J. B. Woolum Made Pine Bluff Superintendent

J. B. Woolum has been appointed superintendent of the street railway department of the Pine Bluff Company, which operates the street railway, electric light and water systems in Pine Bluff, Ark. Mr. Woolum succceeds J. J. Kress, who has been transferred to special work with the Arkansas Light & Power Company. Mr. Woolum is a native of Arkansas. He was in the train service of steam roads from 1900 to 1911, most of the time with the Missouri Pacific. He then entered the electrical business, and was manager of the Camden electric plant when it was purchased by the Arkansas Light & Power Company in 1914. Later he was transferred to the management of the Russellville plant of the Arkansas Light & Power Company, which serves Dardanelle, Morrilton and other towns. While at Russellville he helped install a 750-kw. turbo-generator with a special furnace for the burning of pulverized fuel. He was succeeded at Russellville by B. C. Fowles, a central station operator of many years' experience in the Southwest.

Mr. Davis to Report on South African Line

William J. Davis, Jr., Pacific Coast engineer, General Electric Company, has been transferred to the International General Electric Company and is en route from San Francisco to South Africa, via London, to make studies in connection with the proposed electrification of the government railroad between Cape Town and Pietermaritsburg, a distance of about 800 miles. This work is expected to take about a year. Mr. Davis graduated from Rose Polytechnic Institute in 1892. After spending three years in construction work he entered the employ of the General Electric Company at Schenectady. In 1898 he was transferred from the testing department to the railway department, where he remained for ten years, working from time to time on a number of the notable early electrifications. Some of these were the Albany & Hudson, the Central London, the London Underground, the New York Central, the Detroit River tunnels and the West Jersey & Sea Shore. For the past eleven years Mr. Davis has made his headquarters in the Pacific Coast office and has gained an intimate knowledge of railroad electrification in the West which will be of great aid to him in his new work.

A. R. Baxter Chosen

Auditor of Indiana Interurban Becomes President of Central Electric Railway Accountants' Association

Amos R. Baxter, auditor of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., was elected president of the Central Electric Railway Accountants' Association at its annual meeting at Dayton, Ohio, on Jan. 22, 1921, to succeed C. B. Kleinhans, auditor of the Toledo Indiana Railroad. Mr. Baxter held the office of first vice-president of the association last year.

Mr. Baxter entered electric railway work with the Indianapolis & Cincinnati Traction Company in the spring of 1908 as a night ticket agent at Rushville, Ind. After serving five months in that position he entered the accounting department as a clerk, and subsequently served in various capacities as assistant cashier, cashier, bookkeeper and chief accountant. In 1917 Mr. Baxter was appointed auditor of the company.

Mr. Baxter was born in Rising Sun, Ind., Nov. 23, 1890. He was graduated from the Rushville High School in 1908.

A. R. BAXTER

The Indianapolis & Cincinnati Traction Company is one of the larger electric interurban systems of the Middle West. It operates 107 miles of line.

New Illinois Commission Named

Frank L. Smith has been appointed chairman of the Public Utilities Commission of Illinois by Governor Small. Mr. Smith is at the present time Congressman from the Bloomington district, having been appointed to succeed the late John J. Sterling. In 1920 he was a candidate for the United States Senate, but the nomination went to William B. McKinley, now Senator-elect. Other commissioners named are Cicero J. Lindly, Greenville, former member of the old Railroad and Warehouse Commission; Patrick H. Moynihan, South Chicago, former alderman and member of Mayor Thompson's traction commission; Harold W. Trevillion, Herrin, editor of the Herrin *News*, and James F. Sullivan, Chicago.

Charles B. Hart, superintendent of the light and power department of the Indiana Service Corporation, Fort Wayne, Ind., since September, 1917, has resigned his position to go into business with his brother in Chicago. He had been connected with the corporation for nineteen years.

A. S. B. Little has resigned as first assistant engineer of the Illinois Public Utilities Commission to accept a five-year contract with the City of New York to handle all rate matters of the city before the state and national courts. Mr. Little has been with the Illinois Public Utilities Commission since 1914.

B. T. Longino has been appointed general superintendent of the Columbus (Ga.) Railroad. Mr. Longino will assume a number of the duties formerly coming under the jurisdiction of C. M. Young, who recently resigned as superintendent of power. Mr. Longino is a native of Georgia. He has been connected with the company for several years.

George B. Anderson has been made manager of transportation of the Los Angeles (Cal.) Railway. The appointment, which was announced by G. J. Kuhrts, general manager, was made effective Feb. 1. As announced in the ELECTRIC RAILWAY JOURNAL for May 15, 1920, Mr. Anderson was the manager of service, in which capacity he had charge principally of the relations of the company both with the public and with its own employees. In his new position he will have added duties along these general lines, besides other work relating to schedules, operation, dispatching, etc.

H. S. Russell has recently taken the position of general superintendent of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo. In 1916 he was the electrical engineer of the Denver Gas & Electric Company, Denver, Col., which, like the company at St. Joseph, is controlled by the Doherty interests, but he left in 1919 to become superintendent of distribution for the Empire District Electric Company, Joplin, Mo., another Doherty property. Last year Mr. Russell was promoted to the position of general superintendent of this company. He was graduated from the electrical engineering course of Purdue University in 1908.

Robert R. McCoy, division superintendent of the Illinois Traction Svstem, with headquarters at Staunton, Ill., has resigned that position to enter private business at Oklahoma City, Okla. J. H. Morris, recently stationed at Mackinaw Junction, Ill., as superintendent of the northern lines of the Illinois Traction System, will succeed Mr. McCoy at Staunton. O. C. Genung, former terminal trainmaster at Springfield, Ill., has been appointed superintendent of the northern division of the company, with headquarters at Mackinaw Junction, to succeed Mr. Morris. S. P. Sheibley, former chief dispatcher at Decatur, Ill., succeeds Mr. Genung as terminal trainmaster at Springfield.

Practical Operator Wins Toledo Post

Wilfred E. Cann of Detroit Selected for Position of First Street Railway Commissioner Under Service-at-Cost Plan

When Wilfred E. Cann assumed his duties on Feb. 1 as the first Street Railway Commissioner of Toledo, Ohio, no doubt remained that the city's interest in the local traction system would be efficiently looked after. Mr. Cann takes up his new work with a background of operating experience which well qualifies him to perform the varied tasks that will fall to his lot as Street Railway Commissioner. For the past fifteen years he has served the Detroit United Railway, first as a junior engineer, later as chief engineer and most recently as assistant to F. W. Brooks, president and general manager. The knowledge of operating practice thus obtained has given him a thorough understanding of the engineering, financial and transportation problems which confront the executives of a large urban electric railway.

W. E. CANN won his appointment as commissioner in competition with more than forty other candidates for the position. He was selected by the members of the board of street railway control, Henry C. Truesdall, W. W. Knight and David H. Goodwillie, the appointment being ratified by Mayor Cornell Schreiber. Mr. Cann was highly recommended by Prof. H. E. Riggs of the University of Michigan, who had been called into consultation by the board of control. Professor Riggs formerly conducted an engineering practice in Toledo. He at one time or another made valuations of properties in the vicinity of the city, and served as a member of the board which fixed the value of the "Rail-Light" system. The salary of the Street Railway Commissioner has been fixed at $7,500, the same as that of Mayor Schreiber.

W. E. CANN

Commissioner Cann has held the position of assistant to General Manager Brooks of the Detroit United Railway for nine years. He is 37 years old, and is a native of Winnipeg, Man. He was educated in the Winnipeg public schools and at St. John's College, Winnipeg. Since his graduation from college he has been constantly engaged in railroad work. He entered the service of the engineering department of the Canadian Pacific and for four years did maintenance of way and surveying work for that railroad, the Canadian Northern and the Grand Trunk Pacific. One of his early experiences was on the original survey of the Grand Trunk Pacific route through the Hudson's Bay country.

Fifteen years ago Mr. Cann entered the employ of the Detroit United Railway as a junior in the engineering department. He was later promoted to chief engineer. Since his promotion to assistant to the general manager his work has had to do largely with the network of interurban lines which the Detroit United system operates in southern Michigan.

Commissioner Cann is married and has two sons and a daughter. He has been a member of the Detroit Engineering Society and of the Detroit Board of Commerce. Big game hunting in the Canadian Northwest is his favorite sport.

Commissioner Cann spent his first week in office in "getting acquainted." He set out to make himself thoroughly familiar with the details of his new work, and made a careful study of the system of the Toledo Railways & Light Company, now the Community Traction Company. On Friday, Feb. 4, he made a flying trip to Cleveland, where he conferred with officials of the Cleveland Railway on their methods of checking and of accounting in general. He also collected operating data with a view to instituting measures of economy in Toledo. To the Cleveland traction men he expressed himself as favorably impressed with the accounting system in use there. That system has been in effect in that city for the past ten years.

Sam W. Greenland has been appointed general manager for the receiver of that portion of the Ohio Electric Railway system known as the Fort Wayne, Van Wert & Lima Traction Company. This line extends from Fort Wayne, Ind. to Lima, Ohio. Mr. Greenland will take charge of the operation of this property in addition to the other duties which devolve upon him as vice-president and general manager of the Indiana Service Corporation, general manager of the Fort Wayne & Decatur Traction Company, and president of the Service Coal Company, Fort Wayne.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Aluminum Conductor Orders Show Increase

Plenty of Mill Capacity and Raw Material Now Available to Handle Future Business Looming Up

Contrary to conditions existing last year in the aluminum field there is now sufficient capacity available, both raw material and mill, to place aluminum conductor production on a satisfactory basis. Less than a year ago there was little metal that could be turned over to conductor business, but with a decline in output in the automotive and other fields and an increase in orders for conductors, there is now plenty of capacity at hand which it is expected will be devoted permanently to that trade.

There have recently been placed several orders of good size for aluminum conductor, and the outlook for the future is reported particularly bright. Ingot aluminum, 98 to 99 per cent virgin, is quoted now at 28 cents a pound. With 14-cent copper the first cost of these two metals would be about on a par when it is considered that aluminum for equal conductivity weighs just under one-half what copper weighs.

Malleable Iron Castings Deliveries Short

Market Very Quiet and Prices Reduced —Some Foundries Have Lowered Wage and Operating Scale

The supply of malleable iron, which six months ago was all the way from a year to half a year behind orders on hand, has eased up very materially. As regards new business the market is absolutely quiet, for little or nothing in this line is being bought at the present time.

Those manufacturers specializing in supplying the automobile trade have probably been hardest hit by the slump in business, as the automobile industry was about the first to react to the general falling off of demand. The previous press of orders for malleable castings had been so great, however, that some producers are only just now beginning to catch up with their back orders.

Others who were perhaps quicker to feel the buying slump are at present working on a curtailed operating schedule that is down to three days a week in some instances. Wage reductions of 10 to 15 per cent and laying off of workmen have been quite numerous too. On the other hand, many malleable iron factories have taken no steps in that direction.

Deliveries cover a wide range, dependent on the manufacturer and the type of casting. On the whole, the situation is favorable, because mills are now so situated that they can speed up if necessary. In order to keep the working forces intact and busy, however, there is probably a current tendency not to hurry on filling orders unless the need is urgent. This, as well as the large amount of pattern work required on certain material, may account for the extreme delivery period of two to three months that is quoted. From close to stock up to four or five weeks would seem to be a more representative figure. Stocks of finished material, as a matter of fact, virtually do not exist, as the unsteady market makes this inadvisable. For the same reason raw material is being bought in sparing quantities by some of the malleable castings makers.

Prices have trended downward following declines in fuel, pig iron and in some cases labor costs. The reductions made from peak prices average in several instances from 10 to 20 per cent. Further price developments, of course, depend upon the trend of the underlying markets, but according to one of the large companies in this field, which has already made two price reductions during January, the malleable-iron market has not yet touched bottom.

Will Price Cuts Stimulate Buying?

Several Large Equipment Manufacturers, Though Indicating a Desire to Pass Lowered Costs on to Consumer, Discount Effect of This on Buying

Electric railways on the whole are playing fair with manufacturers with regard to the price situation, according to the consensus of opinion of more than half a dozen large producers of railway equipment. One or two of the latter, it is true, state that the more prices are reduced, the more traction companies seem to await and expect further reductions. As a general thing, however, manufacturers take an extremely liberal view of the present quiet market, stating that they realize the railways of the country are in a bad way financially, and are unable to buy, regardless of price.

Proceeding on this view equipment manufacturers are building for the future rather than counting upon the present market. Attention is being devoted to the time when business will return to normal, and by making price concessions and by carrying slow accounts for long periods producers are endeavoring to cultivate good will against this return of business.

Without exception each manufacturer interviewed gave it as his opinion that the price cuts would be no stimulous to buying at present, as traction companies are endeavoring to keep their inventories as low as possible. At the same time it can be safely stated that it is a general policy of manufacturers in this field to pass lowered costs squarely on to the consumer. At least one manufacturer, it is true, indicates that no reduction in the price of his product may be expected regardless of lowered costs. This company prefers to tide over the existing period of depression until better demand will warrant the price now in effect. In explanation it might be said that in the above mentioned case, increased costs which the company absorbed during the period of rising prices, automatically preclude any great price drops.

Nevertheless, the policy outlined in this instance is far from being representative, according to the attitude taken by other manufacturers. These frankly say in a number of instances where prices have not changed, that lower quotations may be expected. This applies usually to those manufacturers who have not reduced wages. On some products labor costs are as much as two-thirds of the expense of production. Where wage cuts have been made the reduction is usually passed on, but the point to remember is that after a wage cut of 10 or 15 per cent has gone into effect, a second cut cannot be made very soon again without causing trouble. Where labor costs are still unchanged, there is naturally room for lowered prices. In this connection manufacturers point out that they have taken considerable losses on stocks of high-priced material which had to be sold at low levels during the past few months. This, of course, is equalized when producers stock material on a rising market.

Several manufacturers state that they are fully as much if not more anxious for prices to reach a firm basis than is the buying end of the industry. But as prices of electric railway material have not been inflated as have many commodities in everyday use, it is pointed out that to expect price declines in the same percentage as have taken place in the clothing industry, for example, is but deluding oneself. As was noted in last week's issue, consideration of what may be termed a fair price level on any article must include such factors as labor and raw material cost reductions, the amount of previous price increases, and the further element as to how much competition is involved.

Good Prospects Seen in Line Hardware Field

Although Present Buying is Light, Some Manufacturers Are Going Ahead on a Stocking Program

The market for pole-line hardware is only fair from the standpoint of buying. The present month is usually a period of light buying, but though it is true some utilities are covering their spring needs the general demand is considerably less than normal. As far as prospects for good business go, however, the situation is very favorable, according to several manufacturers. Almost without exception producers express confidence that the contemplated extension of power lines by electric railways and central stations will result in heavy buying in the coming spring.

In accordance with this view some hardware producers are going ahead with production, although on a curtailed basis, for the purpose of piling up reserve stocks.

Other manufacturers have only recently caught up with back orders and so are not able to ship large quantities of other than standard material from stock. Deliveries, on the whole, are good, ranging from stock up to two or three weeks.

Prices have held steady since general decreases, ranging from 5 to 15 per cent, were made during the month of December and the early part of January. In some quarters still lower prices are expected, but in others the view is expressed that present quotations will hold steady.

Apparatus Price Drops Announced

Following recent wage cuts of 10 and 15 per cent, depending on the class of work performed, put into effect at the Schenectady works of the General Electric Company, there have been some reductions in prices of apparatus. The wage reduction, however, it is announced, lowered costs only 4 to 6 per cent.

A general reduction of 10 per cent is now reported, effective Feb. 8, on alternating and direct current motors (including welding apparatus), switchboards, regulators, rotary converters, motor generator sets and generators of all descriptions excepting turbo-generators. Power transformers and turbines have not been changed in price. These price changes are in the list prices, not the discounts, new lists having been published.

Westinghouse industrial motors and motor generator sets have been reduced 10 per cent as of Feb. 9.

Electrical Exports Reach Record Volume

Total for 1920 Passes $100,000,000 Mark —With Lowered Prices Indicated Volume Should Hold Up

One of the most encouraging features of the electrical market now is the volume of apparatus and supplies that is being shipped out of the country. The month of December just passed turned in $13,812,251 worth of electrical exports, the highest value for any month on record. Of course much of this material was ordered months ago when business was more active than it is now. But prices in general were higher then, and with that fact in mind there is not so much chance for a falling off in foreign trade as there would have been had prices remained at their high level.

The exports of electrical materials during 1920 amounted to $102,618,508, fifteen per cent higher than the best previous year on record—1919. There has been a good volume of traction materials shipped out of the country right along and with lower prices in view and bettering rates of exchange there is no reason to expect 1921 exports to be any lower. Hydro-electric developments planned or under way in many foreign countries call for railway electrifications.

Buying of Copper Line Material Nominal During 1920

During the year 1920 buying of rail bonds, trolley ears, crossings, splicers, hangers, etc., was merely nominal as electric railways for the most part placed orders to cover their actual repair needs and no more. The supply was generally favorable except that during the period of transportation delays and labor troubles raw material supplies were held up and shipments lengthened somewhat. At no time, however, did deliveries of rail bonds run much beyond one month and overhead line material three months. These figures, of course, improved to a very great extent during the last half of the year.

Prices present a gradually ascending curve to a peak point reached in about the latter part of the third quarter, and from then on the curve gradually descends. Price increases of from 6 to 15 per cent went into effect on copper line material the last of July, while as late as the end of August the price of rail bonds was increased slightly. The discount on the latter commodity, which early in the year was 12½ per cent, in the last quarter rose to 25 per cent following the decline in the price of copper.

Since the first of the year the market has remained quiet, with railways barely covering their repair needs and no more. Deliveries, of course, are good, running from one to two weeks. Prices have declined the past month under the influence of low copper and in some cases lower labor costs. On January 3 price decreases amounting to 5 per cent were put into effect by two producers, while another dropped the price 15 per cent on the same date. On Jan. 12 a fourth large manufacturer lowered prices 10 per cent.

Asbestos Sheet Demand Light in Open Winter

With the open winter to date, there has been little maintenance required in asbestos materials of such nature as asbestos sheet for lining controller cases, contactor boxes, etc. Buying has been light, for the arc-breaking chambers on electric cars have been called on for little extra heavy duty generally necessitated when snow and ice on the tracks make the going heavy.

There is plenty of asbestos sheet available for this market and the supply of raw asbestos above ground is good. In the past few years, though, the demand for asbestos products has been so great that proper care has not been exercised in all the mines to clean up the properties as the work progressed. Consequently some waste has taken place. This, however, is being overcome and production is progressing in good shape. Prices now are about 25 per cent lower than they were a year ago.

Rolling Stock

Detroit (Mich.) Municipal Railway, it is reported, proposes to purchase this year from 200 to 300 cars of various types. Orders will be placed through the city purchasing department.

Hudson & Manhattan Railroad Company, New York City, has just placed an order with the General Electric Company for 866 ceiling fans for its tube cars. These are similar to the four on the Brooklyn Rapid Transit cars. Installation is expected by June 1.

Illinois Traction System, Peoria, Ill., suffered a loss recently through fire which partly destroyed two freight cars and their contents. The damage to the cars is estimated at $3,500 and to the merchandise at $1,115. The trucks and braking equipment were not damaged to any extent.

The Metropolitan (England) District Railway has received the first installment of an order for 100 cars of a new type, placed some time ago with the Metropolitan Amalgamated Carriage, Finance & Wagon Company, Ltd., of Birmingham. The cost of this order, according to the Jan. 7 issue of the *Electrician*, London, England, is estimated at £750,000, or at present exchange rates in the neighborhood of $2,870,000. The electrical equipment is provided by the British Thomson-Houston Company, Rugby. A photograph of the new cars indicates that they are somewhat similar in construction to the subway cars in service on the New York Municipal Railway Lines. The width of the cars is 9 ft. 6 in., and there are three sets of double doors on each side. A speed of 45 miles per hour is attained on non-stop runs. It is the company's intention to establish a regular service of eight-car trains during the rush-hour periods in place of the five, six and seven car trains now operated.

Utah-Idaho Central Issues $300,000 Notes for Improvements.—The issuance of $300,000 in notes for the purpose of purchasing equipment and rolling stock and making improvements has been authorized by the board of directors of the Utah-Idaho Central Railroad, Ogden, Utah, operating an electric line between Ogden, Utah, and Preston, Idaho. The notes are to be held by the large stockholders of the company. The expenditure for the improvements will be made at once by the company. In fact, 100 new steel gondola cars have been purchased from a Columbus, Ohio, firm and will be delivered to the electric lines within the next two months. The new cars are of the latest type and will have a capacity of 55 tons each. They will be used for the handling of sugar beets, coal, lime, rock, sand and gravel.

Track and Roadway

Oklahoma Railway, Oklahoma City, Okla. — The Corporation Commission has granted additional time, or until September 1, 1921, to the Oklahoma Railway to construct a bridge over Lightning Creek and make loop connections on its lines in Capitol Hill, a suburb of Oklahoma City. By a previous order the company was required to have the bridge completed by December 31, 1920. The company, however, found it impossible to secure the funds because of the depressed financial situation and asked for an extension.

United Traction Company, Albany, N. Y.—The United Traction Company and the Schenectady Railway have been petitioned by the Troy Chamber of Commerce for favorable action in the project of extending their lines through Nineteenth Street, Watervliet, and over the Congress Street bridge to Troy. The Troy Chamber of Commerce after careful investigation of this extension believes that both the railway managements and patrons will benefit if this plan is carried through.

San Francisco (Cal.) Electric Railways.—The cost of the proposed extension of the municipal street railroad into the Haight, Ashbury and Sunset districts will be made by the city engineer at an early date. The extension has been proposed by Supervisor Colonel James E. Power and the public utilities committee recommended that the supervisors finance committee appropriate $8,500 from the municipal railroad fund.

Northern Texas Traction Company, Fort Worth, Tex.—The Northern Texas Traction Company plans to improve its right-of-way and its depot and station facilities. The double tracks of the Dallas-Fort Worth lines will be extended and the number of cars in service on the line will be increased.

Dallas (Tex.) Railway.—The Dallas Railway stands ready to build the single-track extension out Seventh Street from Tyler to Edgefield, thence on Edgefield to King's Highway, as ordered by the City Commission under recommendation of the City Plan Commission, according to announcement by Richard Meriwether, vice-president and general manager. The company has opposed the Seventh Street route and has twice gone to the City Plan Commission in an effort to have the line routed out King's Highway instead. The line will cost about $75,000. Work has been held up pending the laying of a storm sewer on Seventh Street. As the sewer is now complete work on the railway will start soon.

Dallas (Tex.) Railway.—The Dallas Railway during the year 1920 spent $1,500,000 for extensions and betterments in Dallas, according to the annual report of Richard Meriwether, vice-president and general manager. In addition to these extensions and improvements the company has added sixty-two new safety cars to the operating equipment at a cost of $430,000.

Gray's Harbor Railway & Light Company, Aberdeen, Wash.—According to a decision by the City Council the Gray's Harbor Railway & Light Company must pave its tracks on Curtis Street after May 1, and notice in writing to this effect has been sent the company. The company had been given orders to plank the intersection in the interval as a matter of public safety.

Power Houses, Shops and Buildings

Montreal (Que.) Tramways. — The Montreal Tramways is planning the construction of two waiting rooms at Place D'Armes Square in Craig Street.

Southern Pacific Company, San Francisco, Cal. — The Railroad Commission of the State of California has ordered the Southern Pacific Company to erect depot facilities in the city of Oakland upon the block bounded by Webster, Fourteenth, Franklin and Thirteenth Streets.

Augusta-Aiken Railway & Electric Corporation, Augusta, Ga.—The Augusta-Aiken Railway & Electric Corporation of South Carolina will build a terminal station at the southeast corner of Seventh and Calhoun Streets, Augusta. The building, which will be of metal and concrete construction, will cost approximately $12,000.

San Antonio (Tex.) Public Service Company.—The San Antonio Public Service Company is not planning any immediate extension of lines, but will install new machinery and equipment in the power plant on the Conception road and at the substation on Tenth Street at a cost of between $250,000 and $300,000.

Trade Notes

William S. Higbie, electrical engineer, 114 Liberty Street, New York City, has established an inspection and purchasing service for buyers of power equipment, with offices at the above address. Mr. Higbie was formerly with the Chile Exploration Company, New York City.

Electric Service Supplies Holds Sales Conference.—All of the sales force of the Electric Service Supplies Company covering the eastern territory met at the Philadelphia plant, Seventeenth and Cambria Streets for a sales conference last week. The field men were thus kept in contact with the factory for an entire week. The daily discussion of conditions in the railway, central station, mining and industrial fields gave indication of increased activity and an optimistic outlook in those lines.

The McGraw-Hill Book Company has just removed from its old quarters at 229 West Thirty-ninth Street, New York City, to 370 Seventh Avenue. The company occupies the entire tenth floor of the new Penn Terminal Building, extending from Thirtieth to Thirty-first Street, with floor space of 20,000 sq.ft. This is the third home of the book company since its organization in 1909, the two former homes having been in different spaces of the Thirty-ninth Street building.

Arthur H. Abbott, who was formerly connected with the Boston office of the General Electric Company as transformer specialist, has recently gone into business as a manufacturers' agent, with offices at 88 Broad Street, Boston. He is handling Schweitzer & Conrad outdoor - substation equipment and liquid fuses, "Hi-Voltage" air-break switches, "Ohio" lifting magnets and fractional-horsepower motors, automatic electric control manufactured by the Sundh Electric Company, Karge-Baker flexible couplings, and stokers and steam-jet ash conveyors manufactured by the Frederick Engineering Company.

New Advertising Literature

Condulets.—Crouse-Hinds Company, Syracuse, N. Y., has issued a folder illustrating actual condulet installations.

Diesel Engines.—The Western Machinery Company, 900 North Main Street, Los Angeles, has issued a catalog describing and illustrating the "Western" Diesel engines, including stationary and marine types.

Circuit Breaker.—The new U-Relite circuit breaker in capacities up to 60 amp. is described in a bulletin of The Cutter Company, Philadelphia, Pa.

Blowers.—The Electric Blower Company, 352 Atlantic Avenue, Boston, is distributing a six-page leaflet describing its different types of "Marvel" electric blowers, rivot forges, ventilating fans, etc.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. B. ANDERSON, Assistant News Editor

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It Pays to Keep Railway Shops Looking Neat

THERE is nothing novel in the suggestion that better work is done amid orderly surroundings than in an atmosphere of slovenliness. It is worth while now and then, however, to tighten up a little on the discipline which is necessary if shops, carhouses, grounds, etc., are to be kept in presentable shape.

A visitor to an electric railway property usually wants to go out to the shops in order to find out what is actually going on. He gains a concrete idea of the general management of the property from the appearance of the shops. No matter if the front office looks like a national bank, the shop, after all, tells the real story.

But it is not the effect on visitors which is the most important, but rather the effect on the men themselves. Neat surroundings conduce to the production of good work, and to pride in that work. During the war there was some excuse for a let-down in the matter of tidiness, but now that labor conditions are becoming normal the old spirit of craftsmanship and general neatness ought to return.

A new broom and a pot of paint will accomplish wonders.

Applying an Important Factory Principle in the Shop

IN REPLY to a question as to the number of men per car maintained that he considered necessary for a properly balanced shop organization, a prominent railway engineer stated that this depends to a large extent on the shop arrangement, the shop methods used and the machinery available for making repairs. He was undeniably right. The workman is but one link in the chain of equipment maintenance. A convenient shop arrangement will do much to lessen manual labor and so to reduce the number of men needed for carrying on the work.

The present condition of most electric railway properties is such that every conceivable means should be used to increase the productive capacity of the shops and to decrease the number of men necessary for operating the various machines and for making repairs. If money is not available to purchase all of the new tools and shop machinery at once, a more efficient arrangement of the machinery already on hand is worth careful consideration. Such factors as reducing the number of times that an armature must be handled in removing it from the truck shop and placing it in position in the armature room for repairs should be studied. A slight rearrangement of shop tools so as to bring wheel presses and wheel lathes between two outside doors of a shop enabled one railway to bring wheels and axles in at one door, to carry out the various operations in mounting and turning and to deliver them when finished through the other door to a platform ready for transportation to other shops of the system. The number of times that the parts were handled and the manual labor necessary were reduced and the work was speeded up considerably. A careful study of shop layouts and shop methods will assist in providing good workmanship at low unit costs and assist in carrying the railway over the present business depression.

A Thrift Suggestion—Treat the Poles to a Preservative

SOME one has said that decay destroys 95 per cent of all wooden poles, that insects and birds eat up another 4 per cent and that mechanical forces and miscellaneous causes dispose of the remainder. If these figures and accuracy are even only distantly related, something like 4,000,000 poles each year fall victims to the fungi which cause decay. Now the Forest Service states that in something like a half century, if present pole consumption is maintained, the wooden pole will be as extinct as the dinosaur. All the more reason then that distribution engineers and railway administrators should give attention to timber preservation.

During the spring and early summer of last year poles of all kinds were difficult to obtain at any price. Inadequate transportation and unsatisfactory labor conditions back in the woods made pole stocks practically non-existent even in the big pole yards of the Northern, Middle and Far West. This condition gave us a glimpse of what the pole situation will be a generation hence with our pole timber reserves depleted. While conditions in the pole market are much better than they were a year ago, it is certainly high time now for all prospective pole buyers to be estimating their next season's requirements and making plans as to preservative treatments.

A recent investigation in the Middle West indicates that from 60 to 70 per cent of the poles now being set receive some form of treatment or other. While this seems like a fair percentage at first glance, it is altogether too small when the available supply of pole timber is taken into account. It is true that very few treated poles have been in service long enough to render accurate data on increased life available. It is also true that there are about as many kinds of preservatives and methods of treatment as the proverbial "fleas on a dog." All of which tends to the confusion of the average distribution man who is not a timber preservative expert.

While some of the prominent communication companies and utility associations have formulated standard specifications for pole treatment, the whole problem is of such recent origin it is not an assured fact that these specifications lead to the best possible results and as a whole standardized practices have not been firmly and widely established. Nevertheless it is certain that good preservatives properly applied do greatly increase pole life and, therefore, that all poles should be treated, the general principle of conservation alone being a sufficient reason. But with construction costs where they are today it is not necessary to go to the realm of ideals to "prove in" the case for preservation. When the problem is figured out in dollars and cents it is seen to be cheaper to use properly treated poles than untreated poles. This is especially true where, as is often the case, the cost of the new pole is only a fraction of the total cost of replacement. While the best practice and the best preservative may still be in the making, information which will make it possible for the average distribution man to secure good results can be found in the publications of the Forest Service and the several engineering experiment stations and timber associations. These sources of information should be utilized to the fullest extent.

The Association Passes Resolutions at the Chicago Conference

THE American Electric Railway Association is to be congratulated on its action at Chicago in adopting, without a dissenting vote, the resolutions with reference to the reports of the Federal Electric Railways Commission and of the special committee on public utilities of the Chamber of Commerce of the United States. This was the outstanding action of the midyear conference. It was the leading object which President Gadsden set out to attain at Chicago. The action of the association in this respect is an answer, or part of one, to the challenge or question outlined by Mr. Wehle in the issue of this paper for Feb. 5. For some reason there was no discussion of the resolutions on the floor of the convention; this was surprising to some, but is probably accounted for by the full discussion of the matter in the special committee and in the executive committee and also by the association members at large which took place previous to the conference.

What the association has done in this regard is to agree within itself that here is a program which will form a basis for meeting with the public. There is established a starting point for working out the details to fit the existing situations, surrounded as they are by various legal, financial, physical and social conditions of the different communities and companies. This is a first step. The industry can profit from it only in proportion as it will capitalize this united action and act in accordance therewith. A full program of publicity, local and national, must be pursued to acquaint the public with the fundamental and just bases of adjusting railway operation and stabilizing railway credit which are pointed out in these reports. The dramatic feature of this action by the railways must not be lost.

Papers Were Good, but Discussion Was Lacking

OTHERWISE, at Chicago, the association itself made no great accomplishment. This would not minimize the wonderful importance of the group of papers presented on the financial situation nor the speeches of Senator Weeks, Mr. Wilkerson and President Gadsden at the banquet in the evening. As Mr. Brady stated in his motion of appreciation to the writers of this series, the association may well be proud of these financial papers. It is to be regretted, however, that there was no open forum discussion of the many interesting topics suggested by them. Thus the thoughts or practices of men from different parts of the country on the questions of home financing, theories of valuation and forms of public aid, to mention only a few of the points brought up in the papers, would have been very helpful. The responsibility in cases of this kind is not entirely on those in charge of the program, but must be borne by the body at large. There is a certain mental inertia in an audience which needs to be overcome, either from within or without. If only some one had started a discussion in Chicago it would undoubtedly have led others to have given their experiences. Probably many attendants at the meeting left for home with the feeling: "Why didn't somebody start something by way of discussion?" forgetting possibly that they should have started the ball rolling themselves. Or if they felt some pricks of conscience, these came too late to be effective. President Gadsden's promise at the close of the Chicago meeting that there will be an active discussion at the October convention is most welcome.

As a matter of fact, the original purpose of the midyear conferences, begun in 1910, was the intimate discussion of economic and financial subjects, which could not very well be taken up during the distraction and in the bustle of the annual convention. The first midyear conferences were executive in their nature to encourage free discussion, and the only scheduled addresses were those given to stimulate remarks from the floor. The meetings have been changed from an executive to an open character, and the rule has been followed to have papers prepared on the subject under consideration. But the presentation of these papers should not monopolize all of the time, and if they are printed in advance, as they were this year, it seems hardly necessary to have them read in full. There should be a return to the original purpose of the midyear meeting, which should be a conference in fact as well as in name.

The 2-Cent Coin Would Prove Costly

ONE other action of the association was to pass a resolution, at the suggestion of T. N. McCarter and C. L. Henry, calling attention of Congress to the immense cost and inconvenience which the adoption of a 2-cent Roosevelt coin would cause the electric railways which use registering fare boxes. In the ELECTRIC RAILWAY JOURNAL for June 26, 1920, the general subject of new coins and their relation to the railways was treated editorially. There is not much to add to what was said then, except, at this time, following this action by the association, to repeat the position taken.

A 2-cent coin at present will satisfy only a sentimental demand. That it would assist any business in any way is apparently not claimed. Admirer though every one is of the great American Theodore Roosevelt, some means of commemoration other than the adoption of a new coin seems more appealing. It would work an expensive hardship on electric railways which would be always present in adding forever another element to coin registering fare boxes. There are, too, other businesses which would likewise be adversely affected wherever coin-receiving devices are used.

The association, it is gratifying to report, has received acknowledgment of receipt of the resolution by the chairman of the committee which is now considering the matter and has been assured by him that the position of the electric railways will receive due consideration.

Decasualizing Platform Labor at Boston

FROM the origin of the street railway industry to the present day an apparently insoluble labor problem has been offered by the fact that the need for platform service is more than doubled for two two-hour periods which necessarily fall within a range of twelve hours or more, if the hours are counted from the time that the cars required in peak-load transportation are taken out to the time they are returned to the carhouse. In the early days, many a company tried to solve this problem by a sort of rule-of-thumb basis rather than on a carefully planned schedule. The result was that the regulars often worked twelve to sixteen hours on the platform, while the extras got such crumbs as they could by hanging around the run board all day and most of the night. With the arrival of a fixed wage for extras and various State regulations concerning platform employment, more thought has been given to greater equalization of the work. In this way, the curse of casual labor has been reduced because the extra man is sure to earn some money every day.

In these days when wages and wage adjustments have suddenly become a very live topic, any radical departures from traditions, especially when they seem to be proving satisfactory to both employer and employee, are worth special study. For this reason it may be well to consider again the labor schedule of the Boston Elevated Railway as described by Edward Dana, general manager of the company, in the Oct. 2, 1920, issue of this paper.

The Boston Elevated Railway, to begin with, had to work out this problem within the restrictions offered by union operation, a guaranteed eight hours a day of platform service and State laws covering the over-all or elapsed period of platform hours and layoff hours. The last restriction, however, may be modified by agreement between union and company. In the ordinary course of events the older, and usually family, men would be willing to work an excessive number of hours, especially where an overtime rate applied. This would react unfavorably on the employment of the younger men from both their standpoint and that of the company; that is to say, the juniors would have fewer opportunities to earn more than minimum pay and the company would have fewer opportunities to get eight hours service per man at the rate for this class.

The management's proposal that all employees be treated as nearly alike as possible presented quite a new point of view to the employees themselves and was subjected to careful scrutiny before acceptance. In practice, however, the result has been to increase the number of employees who work the full eight hours, while the amount of time paid for but not worked to bring about eight full hours for all men is only 8.15 per cent of the total hours and the time paid as overtime amounts to less than one-half of 1 per cent of the total time. This plan has slowed down the turnover materially. The value of such stabilization of employment does not lie merely in the tangible savings that may come from cutting down overtime by the old men and undertime by the young men, but rather in the intangible benefits of the fewer accidents and greater courtesy that follow from higher morale. Finally, the union itself naturally prefers a permanent membership to one constantly changing.

Incidentally, it is interesting to note that the solution reached in Boston, *i.e.*, the increase of the load factor of the men, is the one recognized as desirable in other industries as well, though with them the variations are usually of a seasonal rather than of a daily nature. Typical cases are the clothing workers and coal miners, where efforts to introduce the same remedy, *i.e.*, to increase the average load factor as much as possible, are being made as most satisfactory for employer, employee and public.

Looking at the "Scrap Pile" from a Different Angle

IN CONNECTION with electric railway properties, the term "scrap pile" is used both metaphorically and literally, as was pointed out editorially in the issue of this paper for Jan. 15. There the principal point of view was that of the operator who desires to know when the time has arrived to confide his obsolete equipment to the limbo of the junkman's warehouse. The conclusion was that it is false economy to cling too long to antiquated rolling stock, etc.

There is another point of view from which the scrap pile can be viewed, which appeals especially to the master mechanic. To him the actual physical scrap pile has been a great source of supply during the past few years. The remarkable development of the welding art has made it possible for him to reclaim the old-fashioned junk pile almost entirely. Time was when for a comparatively minor break an entire motor shell or gear case would automatically be scrapped. Now, however, there is very little material that makes its way to the dealer in old metal. And not only so, but many castings or forgings that have been thrown away have been recovered and reinstated in useful work. When the master mechanic has nothing else to do, he studies his scrap pile to see what more he can save, and the men who do the welding will work overtime any day to show how far reaching are the possibilities in applying their skill. The junk pile is, then, not nearly so large as it was five years ago, and in future it will be still smaller. It would disappear altogether if it were not for the fact that there comes a time when it does not pay to repair further. Just when that time is each master mechanic must decide for himself, but there is a profound mathematical law which says in substance, or translated into English, "It does not pay to spend $1.05 to save $1."

Quotation from the Federal Electric Railways Commission Report

No. 8

IT would seem that so long as the railways depend upon earning power, and earning power depends upon passenger revenue, the fixed uniform fare is a broken reed for the industry or for the community to lean upon. Perhaps the general sentiment of the electric railways is best expressed by the evidence of Gen. Guy Tripp before this commission, as follows:

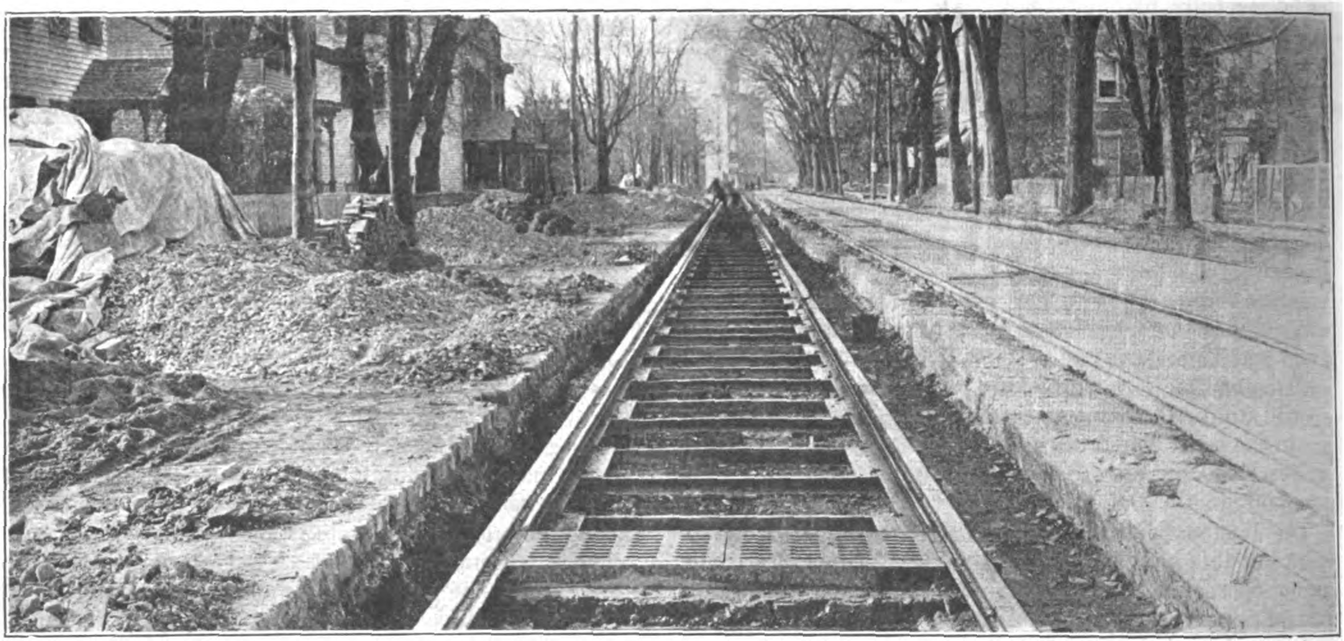
> We were all living in a fool's paradise in the street railway business when we suddenly woke up—when the war woke us up—to find that no business which cannot increase its revenues under any conditions can live or is sound.

Conversely, it may be said that no community should bind itself by contract or otherwise to continue after normal conditions have been restored a rate which might be found reasonable during this abnormal period.

Track Construction in Poughkeepsie

The Double Tracking of a Portion of the Poughkeepsie & Wappingers Falls Railway, Made Necessary by Increased Traffic and Debilitated Track Conditions, Was Carried Out by Using 103-Lb. Grooved Girder Rail with Bolted and Seam Welded Joints, Steel Ties and a Foundation and Paving of Concrete

By A. J. STRATTON
Superintendent Maintenance-of-Way Eastern Pennsylvania Railways, Pottsville, Pa.



NEW TRACK CONSTRUCTION ON MAIN STREET, POUGHKEEPSIE

INCREASES in traffic and a debilitated condition of existing track led the Poughkeepsie & Wappingers Falls Railway to reconstruct and double track its line on Main Street, Poughkeepsie, from Cherry Street to Grand Avenue, a distance of 3,600 ft. With the single-track construction a headway of eight minutes was maintained during the daytime and one of six minutes during rush hours. This interval could not be decreased, due to the location of turnouts. The track had been built in 1893, of 60-lb. A. S. C. E. rail, at the time that the road was changed from horsecar to electric operation. (See the STREET RAILWAY JOURNAL for November, 1894.) The pavement was brick on a concrete foundation.

A clause in the company's franchise made approval by the city necessary for all track construction in paved streets. The standard of the company for this type of construction was 7-in., 70-lb. plain girder rail, with continuous joints, treated wood ties and 8 in. of grouted rock ballast. The Board of Public Works, with which the power of approval rested, declined to approve the type of construction and insisted upon the use of a grooved girder rail with concrete ballast extending not less than 6 in. below the bottom of the ties.

After several conferences the specifications in brief, as decided upon, were as follows:

Rail, L.S. 103-478, International steel ties on 6-ft. centers, bolted joints, seam welded by the Lincoln process. Paving foundation and ballast to consist of 10 in. of a 1:3:6 mixture of concrete. Pavement to be of concrete, 6 in. thick, of a 1:1½:3 mixture. The shoulder between the outside rail and the adjoining brick pavement to be relaid with second-hand brick. The pavement and base to be monolithic.

The city assumed responsibility for all concrete work, the company paying for it by assessments covering a term of ten years.

SAVING WITH STEEL TIES

The company's decision to use steel ties was based upon the lower first cost of material and the saving in excavation and concrete ballast, as compared with other construction. The completed work showed a saving of $3.12 per single-track foot, divided as follows: In excavation, $0.63; in concrete ballast, $2.09; in spikes, $0.09; in cost of ties (steel vs. treated yellow pine), $0.31. In order to maintain the service on the existing track it was necessary to remove the pavement from the entire width of the track, to throw the old track to one side of the trench and then to excavate for one new track. A considerable amount of repair work on the old track was necessary, due to broken rails both at and between joints, probably caused by crystallization. In the making of these repairs it was found very economical and expedient to use an oxyacetylene outfit for cutting out broken joints. Gas was used for burning the bolt holes as well as for cutting the rail and it was possible to substitute a short piece of rail for a broken joint in ten minutes. Passing sidings had to be maintained for cars. This was accomplished by using existing special trackwork by constructing temporary stub end sidings

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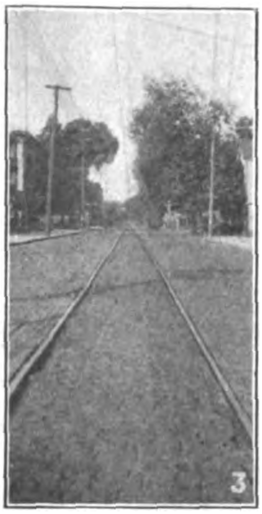
[EDITORS' NOTE.—Mr. Stratton, the author of this article, was in charge of the work described.]



1, 2 AND 3—APPEARANCE OF TRACK BEFORE RECONSTRUCTION WAS STARTED. 4 AND 5—PAVING REMOVED AND TRACK SHIFTED TO THE SIDE

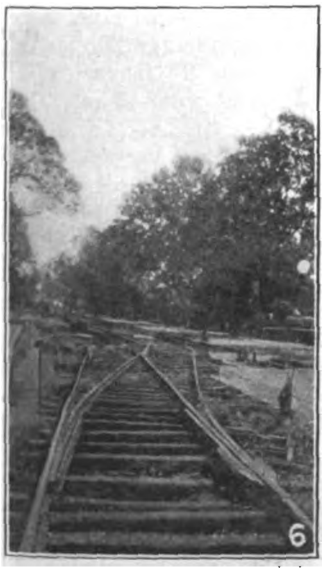
on the pavement and by using a portable crossover rented from another company.

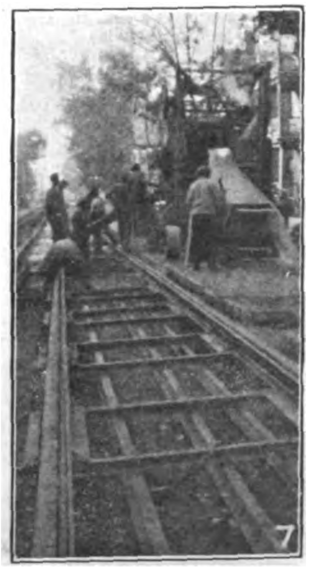
All excavating was performed by pick and shovel, the excavated material being hauled to adjoining dumps by team and dump wagon. The subgrade was rolled with a five-ton roller in accordance with the specifications of the city engineer. This was most useful in compacting the back fill over trenches dug by others to repair sewer, water and gas connections prior to construction of the new pavement. The ballast over these openings and over "soft spots" in the subgrade was reinforced by laying three parallel lengths of 60-lb. T-rail under the steel ties.

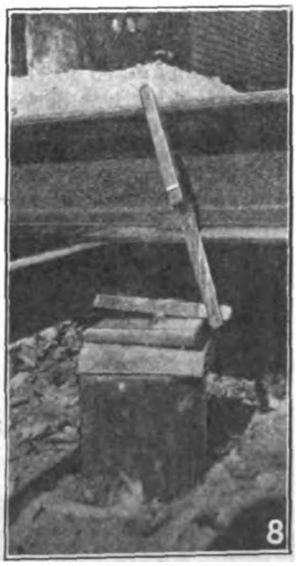
A shortage of track bolts due to non-delivery made necessary the use of but two bolts in the joint plates in portions of the new track over which cars were operated prior to concreting. This was responsible for the cold rolling of the head of the rail at the joint and made necessary the filing away of the lip so formed. Actual track laying proceeded rapidly as the accurate punching for the clips in the steel ties made gaging unnecessary. Preceding the pouring of the concrete ballast and pavement by twenty hours a section of track was blocked to surface, lined and the joint plates welded. The blocks were of white oak with the bark removed, 6 in. long and 5 in. in minimum diameter. Four of these were placed under alternate steel ties. Prior to the blocking of the track the joint plates were loosened and the rail bucked back so that a close joint might be obtained.

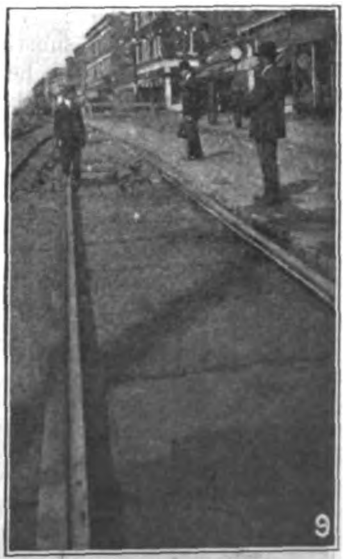
PLATES WELDED AT TOP AND BOTTOM

The joint welding was done with a Lincoln type W machine. A seam was welded at the top and bottom of the 30-in. plates. Each steel joint tie was welded to the rail and the members of the tie were welded so that a crossbond was provided at each joint. The concrete ballast and paving were placed by a contractor under the joint supervision of the city and company. The ballast and paving foundation, 10 in. in thickness, was poured for half of the total trench width, and the 6-in. surface poured for the area between the rails of the first track. The company furnished two men to assist the contractor's force in securing proper tamping of the ballast about the steel ties. The tools used were an ordinary tamping bar and an ice chisel, such as is used for the removal of ice from sidewalks. The latter tool was particularly effective in forcing the con-

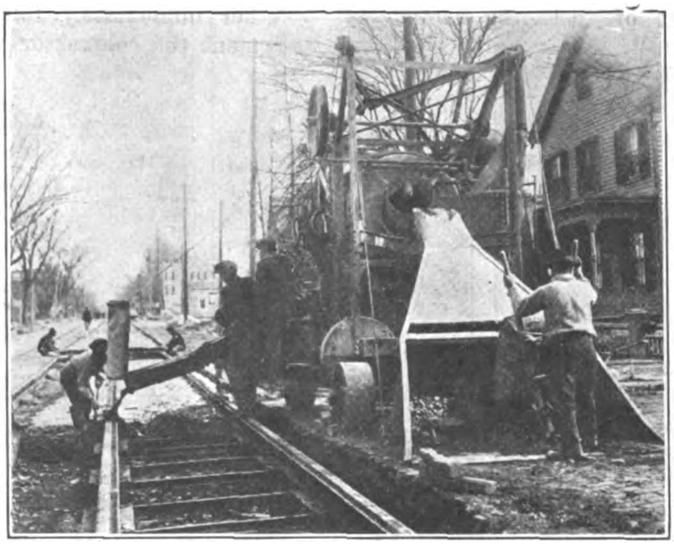








6—TEMPORARY TURNOUT CONSTRUCTED ON TOP OF PAVING. 7—OLD RAILS WERE USED AS REINFORCEMENT OVER SOFT SUB-BASE. 8 AND 9—EFFECT OF EXPANSION ON TRACK AND CONCRETE BALLAST DISPLACING CONCRETE FOUNDATION



TYPE OF CONSTRUCTION USED ON MAIN STREET

crete under the bearing plates of the steel ties. The concrete was mixed with just enough water to permit the mixture to discharge freely from the mixer.

On the day preceding that on which the contractor started to pour the base several hundred feet of track were blocked to line and surface. By 3 p.m. the expansion of the rail had pushed many of the ties from their supports, the actual expansion being 3⅜ in. By 8 p.m. the track had receded to its original position. It was thought that sufficient concrete could be poured before the October sun became very powerful, to hold the track in position. Such, however, was not the case. By 10 a.m. conditions obtained as shown in an accompanying illustration. Nearly 200 ft. of base had been poured, but a longitudinal movement of more than 1 in. took place through that mass. It was possible, however, immediately to retamp the ties so that no damage resulted from this somewhat unusual incident. Joints were broken several hundred feet ahead of the mixer and the track expanded 2½ in., receding again at night.

TABLE I—COSTS PER SINGLE-TRACK FOOT

1.	Engineering and superintendence	$0.250
2.	Removal of old pavement	.737
3.	Grading	1.062
4.	Ballast	4.710
5.	Ties	1.466
6.	Rails, rail fastenings and joints	2.335
7.	Catch basins	.055
8.	Insurance	.080
9.	Other expenditures	.230
10.	Joint welding, exclusive of plates and bolts	.120
11.	Maintenance of old track	.208
12.	Track and roadway labor	.798
	Total for track	12.051

This disturbance appears to have been caused by the complete insulation of the rail and ties from the earth on the wood blocks. The heat absorbed by the rail could not be dissipated in any manner other than by direct radiation. To correct this condition an occasional brick pier was substituted for the wood block, thus enabling some of the heat to be transferred to the earth. No further trouble occurred after this was done.

Tables I and II contain detailed costs covering the entire work. As special trackwork connections had not been received in time for complete installation the cost figures apply to tangent track only.

In Table I, item 1 covers supervision, inspection, timekeeping, rental of engineering instruments, advertising and other expenses properly chargeable to this account. This expense is 1½ per cent of the total cost. The high cost of grading is partly due to the fact that the greater part of the old track was lowered to the bottom of the trench for the new construction. The cost of removing the excavated material to adjacent dumps by team and dump wagon averaged 55 cents per cubic yard with teams at $8 per day.

The ballast charge is for concrete only. Due to grade changes and slight adjustments to alignment the quantity of concrete exceeded the estimate by 6.8 per cent. The contract price of the ballast was $17 per cubic yard. The cost of ties plus unloading is included in item 5. Item 6 includes cost of material, freight, unloading, etc.

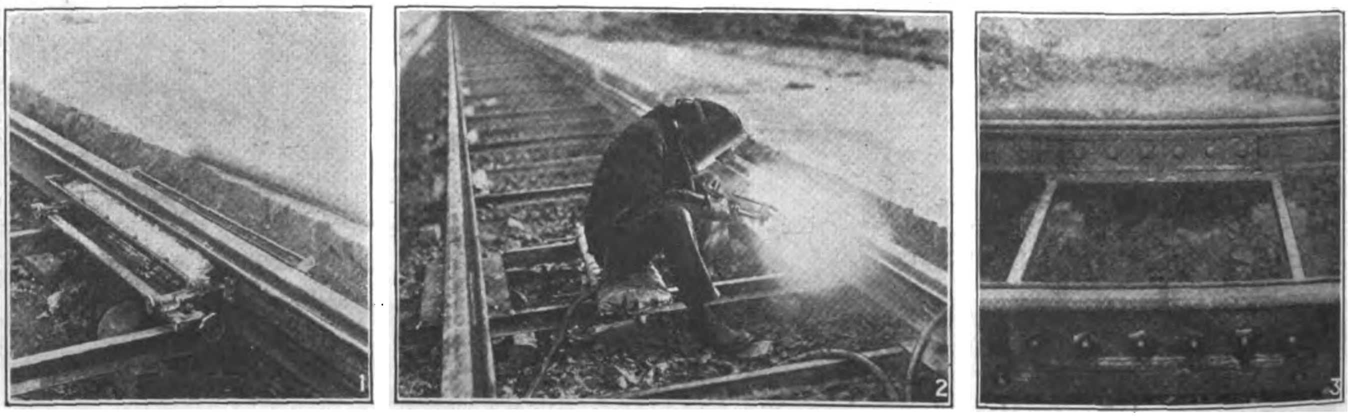
TABLE II—COST OF PAVEMENT PER SINGLE-TRACK FOOT

Six-inch concrete pavement	$3.08
Brick shoulder 1 ft. to 2 ft. wide	.55
Total for pavement	$3.63

Four catchbasins were installed with sewer connection, at a cost of $98.90 each. Item 8 refers to employer's liability insurance, and included in item 9 is the cost of shifting and rebuilding eighteen sewer manholes, plank for temporary vehicle crossings and various expenditures not properly chargeable elsewhere. The cost of joint welding shown in item 10 does not include cost of plate or bolts.

The following list shows the cost per joint. The current consumed was metered during the welding of a number of joints and the average taken:

Splice bars—No. 1—30 in	$3.87
Track bolts—1 in. x 4½ in	.63
Welding steel	.28
Power—7½ kw.-hr	.18
Miscellaneous expense	.25
Labor	1.45
Royalty	.94
Total	$7.60



1—DEFLECTOR BAR IN POSITION FOR WELDING TOP EDGE OF PLATES. 2—THE WELDER AT WORK. 3—FINISHED WELDED JOINT, TOP AND BOTTOM SEAMS AND ENDS OF BOLTS WELDED, RAILS SPOT WELDED TO TIES

Item 11 includes the cost of installing temporary sidings and crossovers, as well as the maintenance of the old track in safe operating condition, and item 12 is the cost of installing the new track, handling material, providing temporary crossings for vehicles and similar charges.

The concrete pavement cost given in Table II relates to contract work only, the price being $22.75 per cubic yard. The width of the brick pavement varies from 1 to 2 ft. on each side of the railway area, due to adjustments necessary to meet the old pavement. The contract price of relaying this shoulder was $3.50 per square yard plus 50.6 cents allowed for cleaning old brick. Work began Aug. 9, and the trackwork completed Nov. 15 and the paving Nov. 20. Owing to the cold weather immediately following the completion of the pavement the contractor laid steam pipes under a covering of straw and, by using his steam roller, in a few days dried out the concrete last poured. The work was performed with a force of from twenty to fifty men. During the early days of the work labor was scarce and very inefficient. The closing down, however, of many local industries during October supplied plenty of labor, but experienced track men were not obtainable at any time. Common laborers received 50 cents per hour for a nine-hour day. In excavating for the new construction some oak and chestnut ties were unearthed which had been in the ground for more than forty-three years. These were relics of the old horsecar days and they were still in a good state of preservation.

Changes in M. C. B. Standards

Various Recommendations of Committees of the American Railway Association, Section III, Mechanical, (M.C.B.), Made at the Convention Last June, Which Were Referred to the Members by Letter Ballot, Have Recently Been Published by the Secretary of that Organization and Those of Particular Interest to Electric Railways Are Abstracted

CHANGES in "Recommended Practices and Standards" as adopted by Section III, Mechanical, of the American Railway Association, which are of interest to electric railways, and which have been formally approved, so that they now represent revised standards, are given below.

COMMITTEE ON CAR CONSTRUCTION

1. *Journal bearing lugs.* Breakage of lugs on journal bearings had been reported and strengthening of these had been suggested. This has been done and a tabulation of the new dimensions is given in the committee's report. The recent changes, it should be noted, do not interfere with interchangeability.

2. *Axle fillets.* Radii of fillets for all standard axles have been made ⅛ in. on the journal at the collar, and ¾ in. on the journal at the dust-guard seat, on the dust-guard seat at wheel seat, and on wheel seat at collar. This does not interfere with interchangeability.

3. *Axle classification.* The standard axles have been given distinguishing class letters: Axle "A" for 3¾-in. x 7-in. journal, "B" for 4¼-in. x 8-in., "C" for 5-in. x 9-in., "D" for 5½-in. x 10-in., "E" for 6-in. x 11-in., "F" for 6½-in. x 12-in.

4. *Journal box classification.* The same classification letters for journal boxes and contained parts (bearings and wedges) have been adopted as for axles, thus journal box "A" is that for a 3¾-in. x 7-in. journal; bearing "A" is 3¾-in. x 7-in., etc.

5. *Truck classification.* The following truck classification has been adopted: Two-axle trucks 2A, 2B, 2C, etc., three-axle trucks 3A, 3B, 3C, etc., the letter designating the axle used.

6. *Car classification.* A similar car classification has been adopted, namely, four-axle cars, 4A, 4B, 4C, etc.; six-axle cars, 6A, 6B, 6C, etc.

7. *Capacity of "D" axle.* The capacity of the standard axles increases by steps, and the committee felt that the steps would be made more uniform by increasing the capacity of the "D" axle (5½ in. x 10 in.) from 38,000 to 40,000 lb., the present dimensions being such that the allowable stresses shall not be exceeded. A proviso is made that no existing cars shall be marked up in capacity on account of this increase in allowable axle load until it has been determined that the body and trucks are safe under such a load.

8. *New axle "F."* A new large-size axle "F" has been adopted, with journal 6½ in. x 12 in., of nominal capacity 60,000 lb. and with bearing, wedge and journal box to suit.

9. *Figuring stresses in axles.* Referring to the 1896 report of the committee on axles, the present report states that the former did not specifically cover the locus of the points of application of load for calculating the part of axle between wheel seats. In 1901 this was referred to in connection with a report on chemical composition of all steel car axles. It is desirable to put this question in such shape that uniformity in calculations be realized. Frames above the journals of the same axle cannot spread more than 1 in., therefore the calculations for diameters of axle sections between wheel fits should be based on length between center of journal plus 1 in.

The following may be considered a continuation of the 1896 axle report, the only addition being the assumed distance between load applications:

$$\text{Allowable stress} = \frac{22{,}000}{1.26} = 17{,}460 \text{ lb.}$$

$$\text{Required diameter*} = \sqrt[3]{\frac{M}{W} \times \frac{W}{S} \times \frac{32}{\pi}}$$

Values for standard axles, based on the distance between load applications, L (distance between centers of journals) plus 1 in. are given in tabular form in the committee's report, to which the reader should refer for more complete information.

M = bending moment in inch-pounds.
W = weight in pounds.
S = stress in pounds per square inch.

Resultant theoretical diameters based on above tables and the standard method of calculation are as follows:

TABLE OF THEORETICAL AXLE DIAMETER

(Y = distance from center of axle)

Axle	Near Center Y, In.	Near Center Diameter, In.	Inside Collar Y, In.	Inside Collar Diameter, In.	At Wheel Fit Y, In.	At Wheel Fit Diameter, In.
A	1½	4.096	22¼	4.707	24	4.748
B	1½	4.650	22¼	5.348	24	5.395
C	1½	5.271	22¼	6.050	24	6.108
D	3	5.870	22¼	6.647	24	6.709
E	3	6.386	20½	7.154	24	7.289
F	3	6.811	20½	7.646	24	7.800

The whole matter is summed up in these definite recommendations:

First. For calculating the diameter of axles between wheel seats, assume that the loads take effect ½ in. from the center of the journal at each end of axle, making the distance between assumed points of load application 1 in. more than the distance between centers of journals.

Second. For calculating the diameters of axles outside of wheel seats, assume a lever arm from the section under consideration to the center of the journal, plus one-fourth of the standard journal diameter, and allow a unit stress of 10,500 lb. per square inch to determine the diameter for minimum road limit.

These recommendations clear up this matter, which heretofore has been indefinite.

It should be noted that the actual loads permitted to be carried are regulated by the A.R.A. code of interchange rules, from which the following is from Rule 86 of the 1920 Code:

TABLE OF AXLE CAPACITIES

Journal, New, In.	Nominal Capacity, Lb.	Total Weight on Rail, Lb.
3¾ x 7	40,000	66,000
4¼ x 8	60,000	95,000
5 x 9	80,000	132,000
5½ x 10	100,000	161,000
6 x 11	140,000	10,000

10. *Passenger-car pedestals.* The committee's attention was called to the fact that the standard passenger car pedestals have shown weakness and a large number of them break, indicating a necessity for redesign. For this reason sheets 21 and 22 of the book of standard drawings are eliminated. These show standard passenger-car pedestals for 3¾-in. x 7-in., 4¼-in. x 8-in., and 5-in. x 9-in. journals. New drawings are given which will be included in the new book of drawings.

11. *Journal-box lids.* Lids now standard are claimed to be unsatisfactory, and the present drawings of standard lids are withdrawn and a new specification substituted, which is given in full in the committee's report.

12. *Specifications for steel for car construction.* Specifications for materials used in car construction are varied from time to time. This has led on the one hand to the use of inferior materials and on the other to the rejection of materials which were really suitable.

Unit stresses commonly allowed for detail parts of cars made of steel, and which are subject to variable loads and occasional light shock, are 12,500 and 16,000 lb. per square inch. The minimum elastic limit should be double this amount, and the product of elastic limit and elongation should not be less than fifty times the allowable stress. As the test piece usually shows better physical properties than the casting or forging, the requirement for product of elastic limit and elongation should be increased by 50,000 lb., making it fifty times the allowable stress plus 50,000 lb. The reduction of area is considered of secondary importance. It should be seventy-five times the allowable stress. An addition of 50,000 lb. for variation between the test piece and the casting or forging may be made, but is considered unnecessary. The ultimate strength and content of carbon, manganese and silicon should be optional, as the other requirements control these sufficiently and the restrictions used in specifications heretofore have caused rejection of good serviceable material.

The recommendation which has been adopted is to provide specifications for all forged and cast steel used in car construction of two grades based on fundamental requirements given below:

CHARACTERISTICS OF STEEL FOR USE IN CAR CONSTRUCTION

Grade of Steel	A	B
Minimum elastic limit, pounds	26,000	32,000
Product of elastic limit and elongation	700,000	850,000
Product of elastic limit and reduction of area	975,000	1,200,000

The ultimate strength and carbon, manganese and silicon content are to be optional. Sulphur is not to exceed 0.05 per cent, and phosphorus 0.05 per cent.

The elastic limit is to be determined by extensometer and the elongation measured in a length of 2 in. Grade "A" steel shall be annealed if the carbon content exceeds 0.30 per cent or if the manganese content exceeds 0.75 per cent. Grade "B" steel shall be annealed if the carbon content exceeds 0.22 per cent or if the manganese exceeds 0.65 per cent.

Pieces of irregular section and of less carbon or manganese content, where shrinkage or other internal strains may be suspected, should also be annealed.

Unimportant details may be accepted on surface inspection only.

13. *Fundamentals of car design.* A number of matters are gone into under this heading, some of which are of great interest to the electric railway engineer. One item which merits consideration because of its being susceptible of alteration to suit electric conditions is that of strength requirements for sills and draft attachments, as follows:

In 1913 the committee adopted a basic figure for strength of draft attachments of 10 sq.in. of steel equivalent to grade "A" material for tension. This strength requirement was somewhat in excess of the strength of the coupler used at that time. A stronger coupler, type "D," has now been adopted, the strength value of which is equivalent to at least 12 sq.in. of steel of the same material.

In order to meet the increased requirements, and compare closely with the increased strength of the coupler, it is desirable to increase the strength requirements for draft-gear attachments and center sills by about 20 per cent.

The formulas on which the former requirements were based are as follows:

$$R = \text{Ratio } \frac{\text{unit stress}}{\text{end load}} = \frac{1}{A} + \frac{X}{SM}$$

A = Area of section in square inches
X = Eccentricity of load in inches
SM = Section modulus

For draft gear and draft attachments: (a) The minimum tension area is T; (b) the minimum shear area is 1.25 T; (c) the minimum bearing area is 0.625 T; (d) the maximum ratio $R = 1.51\ T$.

For center sills between rear followers: (e) The minimum tension area is 2.5 T; (f) the minimum shear area is 3.125 T; (g) the minimum bearing area is 1.563 T; (h) the maximum ratio is $R = 0.61\ T$.

The committee's recommendation is to increase the area *T* from 10 to 12 sq.in. of grade A steel, or an equivalent area of other grades of steel, and change the other values approximately in accord therewith: Area of center sill construction between rear followers, 30 sq.in.; minimum draft gear capacity, 150,000 lb.; ratio of unit stress to end load (maximum) for center sills, 0.05; ratio of unit stress to end load (maximum) for draft attachment, 0.125.

For draft attachments the area of steel in square inches equivalent to the minimum required strength values is:

Tension or compression (square inch. Grade "A" steel)	12
For shear, square inch	15
For bearing, square inch	7½

RECOMMENDATIONS OF COMMITTEE ON SPECIFICATIONS AND TESTS FOR MATERIALS

1. *Steel tires.* Recommended practice specifications are modified in the following particulars: Passenger car tires, formerly listed as Class 3, are now placed in Class B. Further:

	Formerly	Now
Carbon content	0.70 to 0.85	0.60 to 0.80
Manganese content	0.50 to 0.80	same
Phosphorus, not over	0.05	same
Sulphur, not over	0.05	same
Silicon	not specified	0.15 to 0.35

In the new specification the analysis is to be made from a test ingot taken during the pouring of the melt, whereas the old specification permitted the purchaser to require the manufacturer to make the analysis from turnings from a tension test specimen or from a tire, and this analysis is to conform to the requirements above stated.

The new arrangement is a little fairer to the manufacturer and imposes no hardship on the purchaser.

With regard to physical properties, the old specification laid down certain figures of tensile strength, etc., and required that the specimen be cut from a tire. The new specification provides that tension tests need not be made unless so specified by the purchaser, and when required, these tests are to be made from a test ingot taken during the pouring of the melt, and which is required to have received approximately the same amount of work as the tires which it represents. Further provision is made that if the results do not meet the requirements, a re-test may be made on a specimen cut from a tube furnished at the expense of the manufacturer.

The comparative tensile properties are for passenger tires:

	Old	New
Tensile strength, pounds per square inch	125,000	115,000
Elongation in 2 in.	8 per cent	10 per cent
Reduction of area	12 per cent	14 per cent

While the committee does not specifically state the fact, the lowering of the carbon content, and with it the tensile strength, is done to provide a tire which, because softer, will be less liable to crack.

The old specification required a drop or "falling weight" test on one tire. This has been entirely eliminated, presumably because it is felt that such a test does not represent working conditions and is inconclusive, in that a tire of steel which would withstand such a test might nevertheless fail under the repeated small blows and vibration which it undergoes in actual service. It therefore does not warrant the expense of the test.

The old specification had nothing to say about mating, or permissible variations in dimensions; the new provides that the tires shall be grouped as to outside diameters and shipped in sets, and also provides limiting dimensions very much of the same character as those for solid wrought wheels.

Under "inspection" much of the matter in the old specification relates to subjects more properly belonging in the contract and has been eliminated in the new, the latter containing only the usual inspection clauses.

2. *Journal bearings.* This matter of journal bearings is one of particular interest to the electric railways which very generally buy to the A.R.A. (M.C.B.) specification. The important changes are the following: (*a*) Before lining the brass back must be bored and tinned; (*b*) after lining, the ends shall be made smooth by scraping, filing or machining. They must not be ground or rubbed with abrasive materials; (*c*) composition of back to be as follows:

	Class A, Per Cent	Class B. Per Cent
Lead	16 to 24	24 to 30
Tin	5 to 7	4 (min.)
Total of other impurities, maximum	4	3
Copper	67 to 77	63 to 72

The purchaser should specify whether Class A or Class B is required, as otherwise the specification provides that Class A will be provided. It is evident that Class B is the softer, cheaper material.

(d) Composition of lining. Two kinds of lining composition are included, Class C for linings of a nominal thickness over ⅛ in., and Class D for linings ⅛ or less in thickness.

	Class C	Class D
Tin	3 to 5	0.5 to 1.5
Antimony	8 to 10	....
Antimony plus tin	12 to 14	3 to 5
Arsenic, maximum	0.2	....
Total of other impurities, maximum	0.5	0.5
Lead	85 to 88	94 to 96

Either composition of the back may be used with the composition of the lining metal specified for the thickness of lining which is ordered.

3. *Axles, shafts and other forgings, annealed and unannealed.* The new specification divides the material into two classes, the one "medium" and the other "mild." Medium forgings are intended for important large parts such as axles, etc. Mild forgings are to be used only where so ordered, for parts of minor importance and those which are to be case hardened.

Another new provision is that unless otherwise specified, annealed material shall be furnished for medium forgings. All axles over 6 in. in diameter at center shall be annealed. Mild forgings may be furnished unannealed unless otherwise specified.

The process of manufacturing the steel is limited to either open-hearth or electric.

It is interesting to note that this is the first reference to "electric" steel in the association's specifications, and as such is a recognition of the increasing importance of this process, already referred to editorially in a recent issue of the ELECTRIC RAILWAY JOURNAL.

While annealing is provided for as above stated, it is required that material ordered to these specifications shall under no circumstances be quenched.

The chemical composition of the two grades is as follows:

	Medium, Per Cent	Mild, Per Cent
Carbon	0.38 = 0.52	0.08 = 0.18
Manganese	0.40 = 0.70	Max. 0.55
Phosphorus	Max. 0.05	Max. 0.05
Sulphur	Max. 0.05	Max. 0.05

While it is not so stated in the specifications, it is obvious that the "mild" grade is the only one of the two which can be used for parts that are to be welded. The physical properties of the "medium" agree with the old specification. For the mild grade the following properties are required: Tensile strength, 47,000 lb. per sq.in; yield point, 0.5 tensile strength; elongation in 2 in., 30 per cent; reduction of area, 45 per cent.

A rather drastic move is the elimination of the old clause that "a sufficient discard shall be made from each ingot to secure freedom from piping and undue segregation." The committee gives no reason for omitting the clause.

4. *Carbon steel axles.* This is the standard specification for the ordinary freight-car axle purchased to chemical specification and drop test. The title is misleading inasmuch as the annealed steel axles referred to under paragraph No. 3 above are also carbon-steel axles.

The chief changes are the inclusion of the electric process in the manufacture of the steel, the raising of the top limit of manganese content from 0.60 per cent in the old to 0.70 per cent in the new, and the inclusion of the following formulas for calculating height of drop of a 2,240-lb. weight, and the permanent set produced by the first blow.

H in feet = square of diameter of axle at center in inches.

$$H = d^2$$

L = length of axle in inches.

$$\text{Set for axles over 65 in. in length} = \frac{L}{1.9d} - \frac{d}{2} + \tfrac{1}{2}\text{ in.}$$

$$\text{Set for axles 65 in. or under in length} = \frac{L}{1.9d} - \frac{d}{2} + 1\text{ in.}$$

Drop test for 3¾-in. x 7-in. journal axle is included: Diameter of axle at center, 4¼ in.; length of axle, 83¼ in.; height of drop, 18 ft.; number of blows, 5; maximum permanent set, 8¾ in.

5. *Solid wrought wheels.* The old specification for solid wrought wheels, which only covered locomotives and tenders, is now revised to include car wheels, the chemical requirements remaining unchanged.

Under "tolerances" the height of flange is required to be not more than 1/16 in. over that specified. The old specification allowed ⅛ in.

A list of gages and tapes which shall be used is given: Wheel circumference measure, A.R.A. sheet 16 B; maximum flange thickness, gage A.R.A. sheet 16; maximum flange thickness, gage A.R.A. sheet 16; rotundity gage, thickness gage A.R.A. sheet 16 A; gage for measuring service metal A.R.A. sheet C-1; plane gage, A.R.A. sheet 16 A.

COMMITTEE ON CAR WHEELS

This report refers chiefly to 33-in. chilled cast-iron wheels. Two new designs of wheels have been adopted, one 650 lb. and the other 750 lb., to take the place of the present 625 and 725-lb. wheels. These are of the same so-called archplate design, similar to the 700 and 850-lb. wheels adopted in 1917. These designs are in accordance with recommendations of the Association of Manufacturers of Chilled Car Wheels, and have been adopted on account of the universally favorable reports on the performance of the 700-lb. archplate wheel in comparison with the 650-lb. wheel of the former design. Designs of the new wheels are given in the report.

The old method of stenciling tape size is discontinued and instead a permanent record is provided as follows: Five small lugs ⅜ in. in diameter by ⅜ in. high are to be cast on inner plate near the hub, as shown on a sketch given in the report. As each wheel is taped the necessary number of lugs are to be cut off, those remaining to indicate the tape size. For example, for a normal wheel of tape-size No. 3, two lugs are to be broken or cut off, the three remaining indicating a tape-3 wheel.

A slight change is made in the maximum and minimum flange thickness gage in order to prevent wear of the gage.

The recommended practice for mounting wheels is changed in the following particulars:

1. Wheels having flanges worn so as to take limit gages for remounting cast-iron wheels shown on M.C.B. sheet 16 A shall not be remounted.

2. Wheels must have a straight bore with the exception of the chamfering for not more than ⅜ in. at the back hub face, which may be allowed to facilitate application to axles.

3. Wheels should be mounted centrally on the axle. All axles should be center punched and some form of gage be used to measure the location of the wheel from the center punch mark. The center mounting of wheels is necessary in order to secure proper running of the wheels and to prevent hot boxes.

4. Wheels should ordinarily be fitted to axles, and not axles fitted to the wheels. It is usually unnecessary to turn the wheel seat of second-hand axles unless they are a tapered fit.

5. In mounting either new or second-hand wheels, care should be used to see that the wheels are of the same diameter. In the case of new wheels, the wheels should be taped in order to check the tape size marking, and in no case should wheels of different tape sizes be applied to the same axle.

6. The alignment of axle lathe, the trueness of the centers and the jaws on boring mills should be checked frequently in order to insure proper mounting of the wheels.

7. While the wheels are being bored the high spots on the flange should be marked, and in mating the high spots should be put opposite the spots on the mate wheels.

While the provisions only represent common practice in the mounting of wheels, it is the first time they have been formulated in the A.R.A. specifications and for this reason are notable.

CONCLUSION

The action taken by the A.R.A. (M.C.B. Association) in adopting these matters is from an engineering standpoint one of the most sweeping ever taken by it. In one way or another these affect the interests of the equipment men of the electric railways, and for this reason they have been presented to the readers of this paper so that they may be in touch with the trend of affairs in the steam railway field.

Standard Hand Brake Riggings*

Some of the Most Common Types of Hand Brakes in Use on Electric Cars and the Principles Involved in Their Action Are Described and Methods Given for Calculation of Forces Acting in the Several Parts—Particular Attention Is Devoted to Devices Other than Levers for Increasing the Braking Force

BY H. M. P. MURPHY

IN COMPUTING the forces developed in any foundation brake rigging it is, of course, necessary to start with some known force. This is generally the one exerted at the brake handle where hand brakes are used, or by the brake cylinder push rod with air brakes. As hand brakes are quite generally used on electric railway cars, methods for computing the force exerted on the chain attached to the hand-brake pull-rod will be considered first.

All common types of hand-brake riggings in present use consist essentially of a wheel or handle (crank arm) mounted on a shaft or staff connected with a drum, around which a chain is wound in order to apply the brakes. In some standard constructions this drum is located directly on the hand-brake staff and is often tapered in such a way that the chain is wrapped around the small end when the brake shoes are tight against the wheels. In other cases a cam is substituted for the drum and it is so designed that it gives the same effect as the tapered drum. When hand brakes are applied to cars in connection with air brakes, the pull rod or chain controlled by the hand-brake mechanism is generally attached directly to some one of the levers of the airbrake rigging in such a way that the brakes may be set on both trucks from one or both ends of the car.

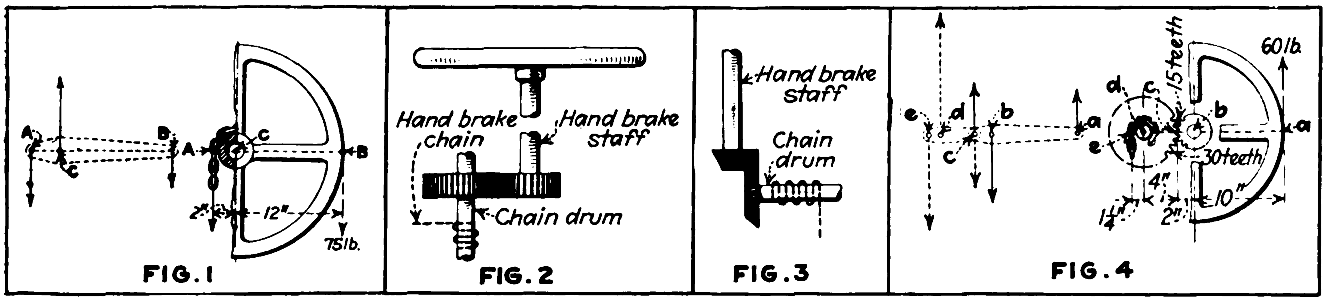


FIG. 1—GEARLESS STAFF HAND BRAKE. FIG. 2—SPUR-GEARED STAFF HAND BRAKE. FIG. 3—BEVEL-GEARED STAFF HAND BRAKE. FIG. 4—DIAGRAM OF FORCES FOR SPUR-GEARED STAFF TYPE OF HAND BRAKE

The principles involved in the determination of the forces developed by any standard hand brake are exactly the same as those outlined in a preceding article published in the ELECTRIC RAILWAY JOURNAL for Jan. 15, 1921. The problem is simply one of leverage, for chain drums, hand wheels, etc., are merely disguised forms of simple straight-line levers as will be shown in the following paragraphs:

In order to investigate the laws connected with hand brake riggings, consider the typical form of apparatus shown in Fig. 1, where a brake wheel 24 in. in diameter or 12 in. in radius is shown on a shaft carrying a small chain drum, the distance from the center of the drum to the center line of the chain being 2 in. Now it is obvious that the force developed on the chain will be constant, if a given total force be applied to the rim of of the rim to which this force be applied. In order to show clearly that the mechanism in question is actually a simple lever device, suppose that the given total force is applied at the point *B* as indicated in the figure. Evidently the line *ACB* is equivalent to a simple straight-line lever and, therefore, the relation existing between the forces acting on the rim of the wheel and on the chain may be accurately determined by the proper application of the "General Leverage Rule" given in the preceding article.

As an example illustrating the method outlined, suppose that a total force of 75 lb. is applied to the rim of the wheel in Fig. 1 and let it be required to find the the wheel, regardless of the part of the circumference resulting force developed on the chain. By applying the "Leverage Rule" and considering the brake-shaft center, C, as the fulcrum,

$$\text{Desired force} = \frac{(\text{known force}) \times (\text{lever arm of known force})}{\text{lever arm of desired force}}$$

or

$$\text{Force on chain} = \frac{(\text{force on rim of wheel}) \times (\text{lever arm of force on rim of wheel})}{\text{lever arm of force on chain}}$$

$$= \frac{75 \times 12}{2} = 450 \text{ lb.}$$

The preceding investigation shows that in order to determine the force developed on any hand-brake chain, wound on a drum which is attached directly to the hand-brake staff, it is merely necessary to know the total force applied to the rim of the wheel or handle; then to multiply this force by the radius of the wheel or crank arm, and to divide the product thus obtained by the distance from the center of the drum or shaft to the center line of the chain.

It should be noted that it is customary to assume a force of from 50 to 75 lb. as that which is applied to the rim of the wheel or to the handle of the crank, as this amount can readily be applied by a man in ordinary operation.

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*This is the second of a series of articles on brake rigging calculation. The first appeared in the Jan. 15 issue of this paper.

In all cases care must be taken to ascertain the correct distance from the center of the drum shaft to the center line of the chain. This is especially important when a tapered drum or cam is used, for in such constructions the distance in question is variable and, therefore, the brake must be fully set when measurements are made. The object in using a tapered drum or a cam is to enable the operator to take up the slack in the rigging with a comparatively slight rotation of the wheel, the chain being made of such length that when the slack is all taken up the chain will be coiled on the small part of the drum, thus permitting the desired force to be obtained on the chain.

In many cases where a powerful hand brake is required, the hand-brake chain or rod is not attached directly to one of the levers employed in the air-brake rigging but to an intermediate multiplying lever, which in turn is connected with the main rigging. The principles involved in the determination of the forces developed by such constructions are, of course, identical with those discussed in the preceding paragraphs.

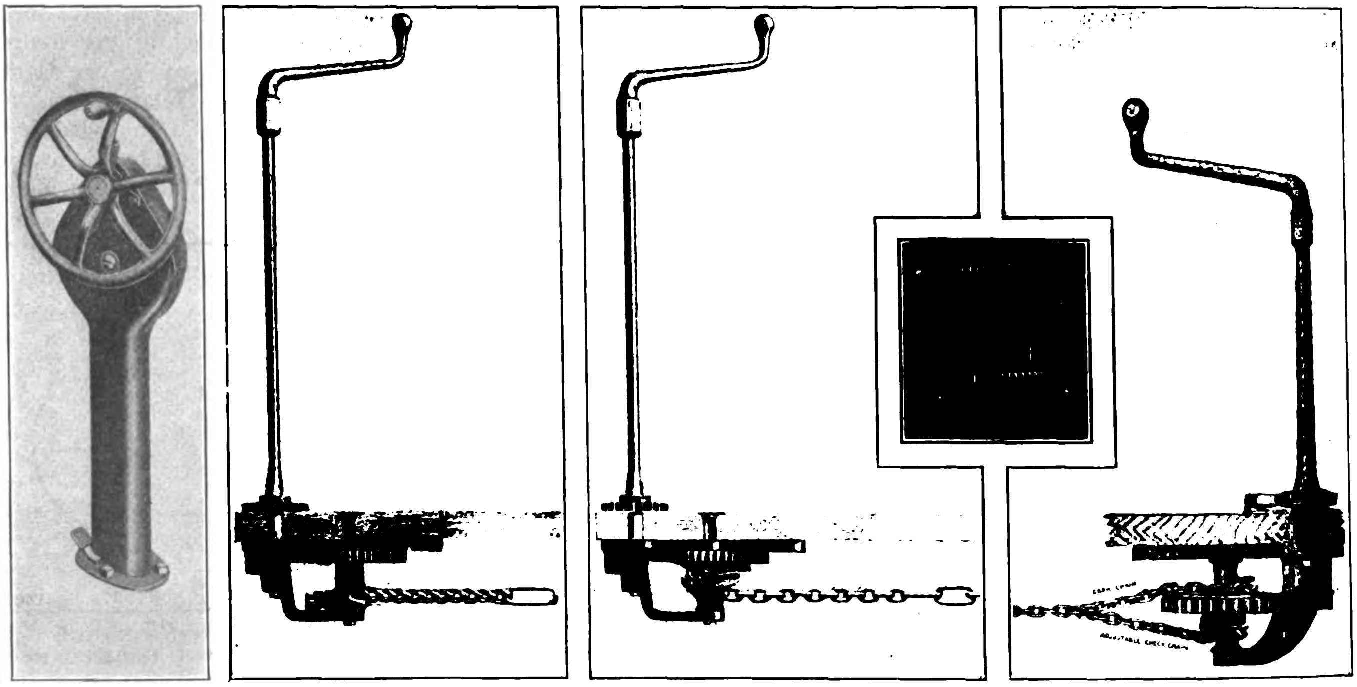


FIG. 5—SEVERAL TYPES OF HAND BRAKES USED ON ELECTRIC CARS

USE OF GEARED HAND BRAKES

In some instances gears instead of levers are used to multiply the force applied to a hand brake wheel or crank. Figs. 2 and 3 illustrate such devices. In Fig. 3 bevel gears are employed, whereas in Fig. 2 the gears are of the plain spur type.

The principles involved in the computation of the forces developed in geared hand-brake riggings are simply those of leverage, each gear acting like a straight-line lever. In order to show this, consider the system illustrated in Fig. 4, which is a top plan view of a geared hand brake. The hand wheel has a 10-in. radius, the small gear or pinion a 2-in. radius and the large gear a 4-in. radius, while the distance from the center of the chain drum to the center line of the chain is 1¼ in., all as indicated in the figure. It will be noted that the hand wheel and small gear are both attached to the hand-brake staff, while the large gear and chain drum are fastened together so as to revolve about a common center. By an inspection of this figure it is clear that the line *a b c* practically constitutes a simple straight-line lever, the force developed at the point *c* of this lever being delivered to the point *c* of the similar lever *c d e*. Consequently to find the force developed on the hand-brake chain by a given force applied to the hand wheel it is merely necessary to employ the "General Leverage Rule" as already discussed.

To illustrate the application of the principles just outlined, suppose that a force of 60 lb. is exerted on the rim of the hand wheel shown in Fig. 4 and let it be required to find the resulting force obtained on the chain.

By considering the middle point *b* as the fulcrum of the lever *a b c*,

Force acting at point *c* =

$$\frac{(\text{force on hand wheel}) \times (\text{lever arm of force on wheel})}{\text{lever arm of force at point } c}$$

$$= \frac{60 \times 10}{2} = 300 \text{ lb.}$$

and considering the middle point *d* of the lever *c d e* as the fulcrum,

Force delivered to chain =

$$\frac{(\text{force at } c) \times (\text{lever arm of force at } c)}{\text{lever arm of force on chain}}$$

$$= \frac{300 \times 4}{1.25} = 960 \text{ lb.}$$

If the gears used had been of the bevel type the solution of this problem would have been just the same providing, of course, that the radius of each gear had been unchanged.

As the accurate measurement of the proper radius or diameter of a gear is quite difficult, it is customary to employ the numbers of teeth instead of these dimensions, for it is a very easy matter to count the teeth in a gear and then the calculations can be made with perfect correctness. In order to use this method the following rule may be followed:

To find the force delivered to the chain of a geared hand-brake rigging multiply the total force applied to the hand wheel or crank by the product of the radius of this wheel and the number of teeth in the gear attached to the chain drum, then divide this result by the product of the number of teeth in the gear on the hand brake staff by the distance between the center line of the chain and the center of the chain drum.

This rule may be expressed more concisely in the following mathematical form:

$$\text{Force on chain} = \frac{(\text{force on wheel}) \times (\text{radius of wheel}) \times (\text{number of teeth in drum gear})}{(\text{number of teeth in staff gear}) \times (\text{distance between chain and drum centers})}$$

To illustrate the preceding rule, let it be required to find the force delivered to the chain of the rigging shown in Fig. 4 when a force of 60 lb. is applied to the rim of the hand wheel, the numbers of teeth in the gears being 15 and 30 and the leading dimensions as given in the figure.

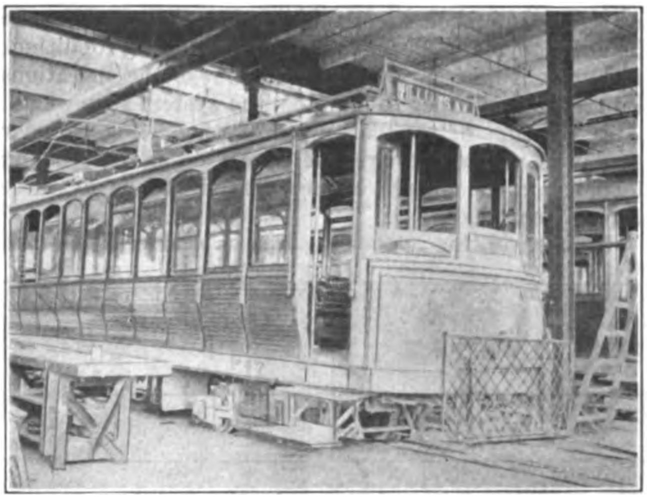
By inserting the numerical values in the mathematical formula just given we have:

$$\text{Force on chain} = \frac{60 \times 10 \times 30}{15 \times 1.25} = 960 \text{ lb.}$$

By comparing this result with that obtained by using the gear diameters instead of the numbers of teeth it is seen that they are the same in both cases.

The most common four types of hand brakes used on electric cars are the gearless staff, spur-geared staff, spur-geared staffless and worm-geared staff. Several illustrations are given of these types, but as the principles involved are the same, calculations can be readily made in the same manner as described. In the examples given the drum on which the chain is wound has been considered as uniform throughout its length. With conical, eccentric or specially shaped drums the effective radius or lever arm for the chain is in all cases equal to the distance from the center of the drum to the center of the chain when the brakes are fully applied.

This radius will vary according to the shape of the drum, the method of winding, the shape and character of the chain and the travel of the brake shoes. Tests made by G. L. Fowler using dynamometers in the truck pull rods showed braking pressures at the wheels to vary as much as 40 per cent with the same pressure applied to the brake handle.

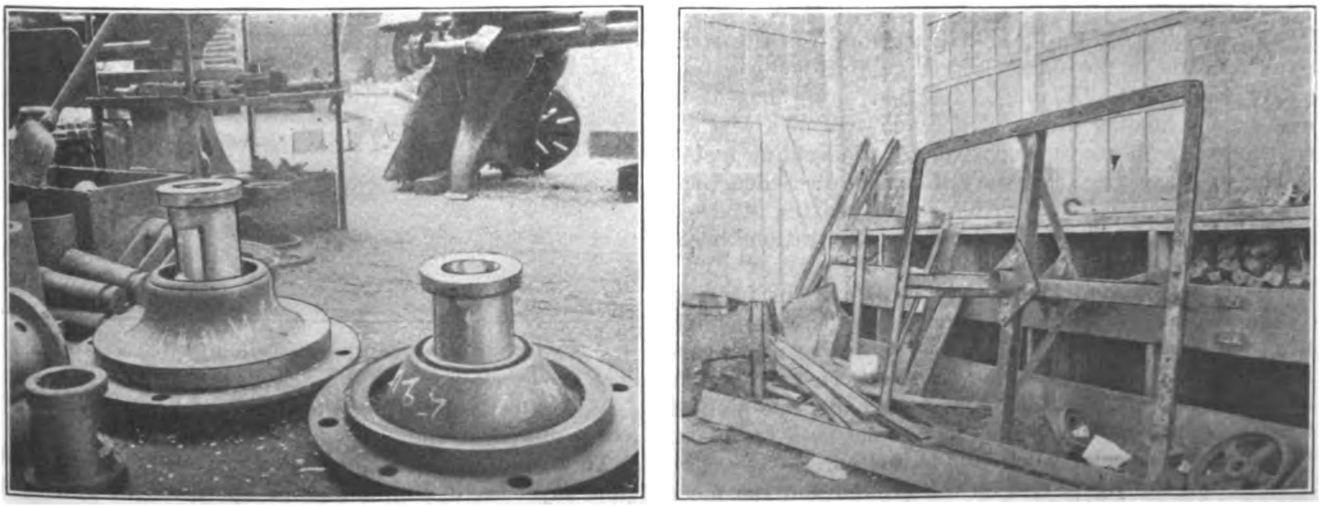


OPEN CAR IN PROCESS OF CONVERSION TO CLOSED TYPE AT PORTLAND

Shop Notes from Portland

Some New Devices that Have Been Found Economical in the Mechanical Department of the Portland Railway, Light & Power Company, Portland, Ore.—Electric Welding Used Extensively

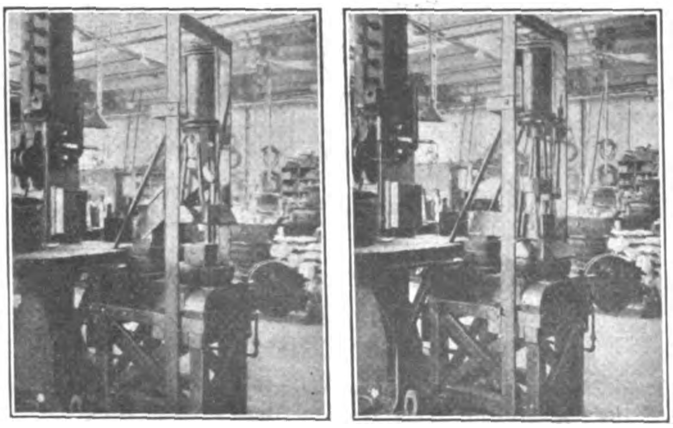
Among the best-known electric railway shops in the United States are those of the Portland Railway, Light & Power Company, which were built in 1912 and were described in the issue of the ELECTRIC RAILWAY JOURNAL for July 26, 1913. The shops have been in use more than eight years and during this time have demonstrated their adaptability to the needs of the property. Articles covering details of practices in the shops have appeared in the columns of this paper from time to time, many of them signed by F. P. Maize, master mechanic. About six years ago Mr. Maize put into operation a planning system by which the routine and special shop work is taken care of somewhat along manufacturing lines. He covered this plan in an article in the March 18, 1916, issue, page 539, and H. C. Brumbaugh, of the mechanical department of the same company, told of the modifications which had been made in this system during the following year. This article was printed in the March 17, 1917, issue, page 488. One of the editors of the paper visited the Portland shops recently and learned from Mr. Maize that the



AT LEFT, BOX-TYPE MOTOR BEARINGS HAVE BEEN BUILT UP BY WELDING ON COPPER. AT RIGHT, A SPECIAL TRACKWORK JIG WHICH HAS GIVEN A GOOD ACCOUNT OF ITSELF war had not made necessary the abandonment of the planning system, but that abnormal labor conditions had made it necessary to combine some of the operations into groups in order to simplify the system somewhat.

At the time of the visit a job of remodeling summer cars was going through the shop, eleven cars being included in the order. A photograph of one of these cars is reproduced.

The plan in this remodeling was to produce a one-man car at a minimum of expense, to which end the side was closed in with wood, utilizing the curtain grooves in the posts as guides. Rectangular fixed sash were placed above the sidings, and above these were placed small sash which could be inclined inward for ventilation. In addition eight Garland ventilators were installed on the roof, four on each side. Simple folding steps and door were installed and the car was completed. The changes mentioned cost about $400.



FIELD COIL PRESS COMBINED WITH TESTING TRANSFORMER

Welding has been practiced in this shop for many years, one of the latest applications being in the building up of babbitted brass bearings for General Electric 210 box-type motors when these become worn so as to be loose in the motor housing. The bearings are built up with copper by the electric arc on the deposit system, old motor field wire being used for welding metal. When they are built up they are turned off a trifle large and hydraulically pressed into the housing. The fit is made so that a force of about four tons is required in the press.

THIS JIG FACILITATES SPECIAL TRACKWORK WELDING

A great deal of the special trackwork for the company is made in the shop, electric welding being extensively employed. In this connection a jig has been devised for holding pieces of special work in a vertical position to facilitate the depositing of the welding metal.

The jig was made from the frame of a discarded Brill maximum traction truck, with a center bearing attached to the frame, as shown in one of the illustrations herewith.

The frame is of flat steel ⅞ in. x 3 in. The bearing is simply a piece of 3-in. pipe with square flanges, which are spaced about 18 in. apart. The frame and bearing are connected by angle irons carried from the frame to the bearing flanges at both ends, one side of the jig being kept flat so that it will act as a faceplate, to which the special work can be bolted.

In action the jig is laid on the ground and the piece of special trackwork is bolted in place. The jig is then hoisted by means of a crane and the whole thing is supported on a rod resting on trunnions.

The special work is bolted so as to balance around the axis as nearly as possible. The operator in welding up the joints can thus rotate the work so that the joints come in such a position as to suit his convenience. Obviously the weld is most satisfactory when gravitation aids in the depositing of the metal. This simple device is reported to have been very effective in accomplishing this purpose.

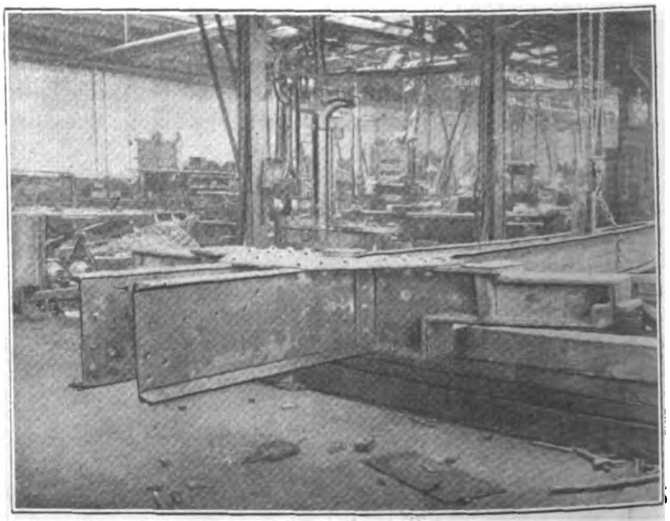
A STEEL UNDERFRAME THAT WILL WITHSTAND BUMPING

The Portland company has a great many freight cars, the construction of which is not as rugged as might be desired. It has been found in some cases desirable to put under the bodies of these cars a steel underframe like that of which one end is shown in one of the illustrations. This is built up of two 15-in. channel sections, with cast-steel bolsters riveted in place and reinforced with a ½-in. gusset plate, riveted and welded in position; ⅞-in. rivets being used. This is the company's standard underframe for freight cars, which have a carrying capacity of 80,000 lb. and a length of 41 ft. As shown in the picture, the center sill runs through and the bolster is made up in two sections.

One of the latest devices constructed in the shop is the field coil press, by means of which a hot field coil can be compressed to shape and the transformer test for insulation can be applied at the same time. Pictures of the press are reproduced herewith with a pressure plate in the "up" and "down" positions respectively.

The press consists of an 8-in. air cylinder mounted at the top of a frame of 1 in. x 4-in. steel bar. The plunger carries a rectangular pressure plate with a hole in it large enough for it to surround the core of the transformer. This pressure plate is of wood and it is attached to the plunger by four legs.

The testing transformer is mounted on a stout wooden table, and at the base of the vertical limb is a plate upon which the field coil under pressure and test rest. Valves for controlling the air supply to the cylinder are mounted at the side of the table.

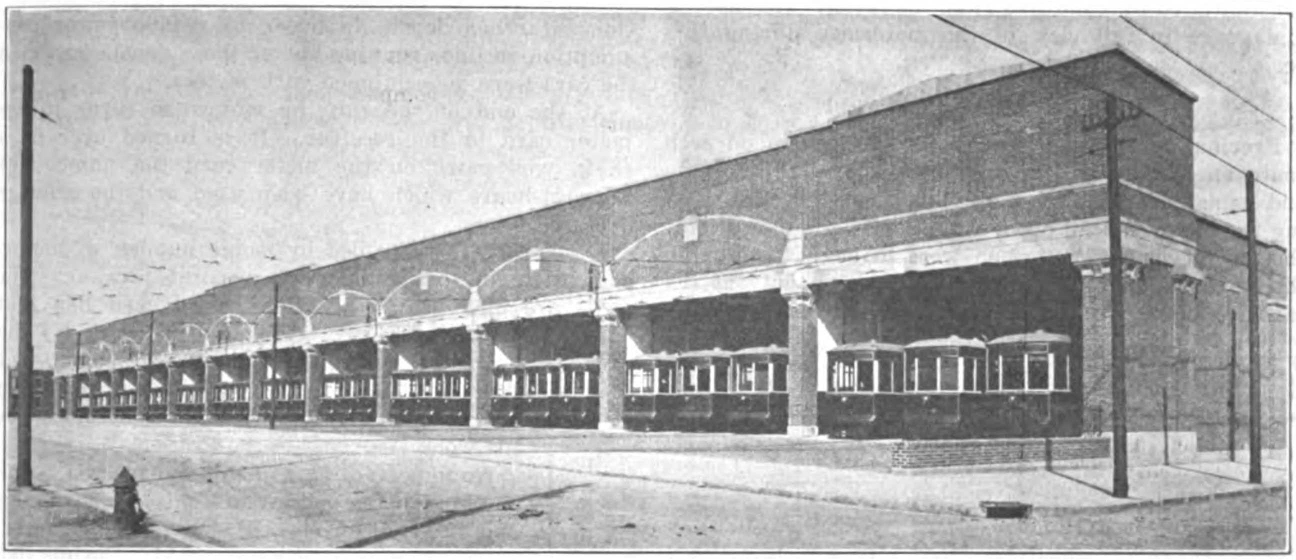


PART OF UNDERFRAME FOR FREIGHT CAR

This combined pressing and testing device is a great time saver as it eliminates one operation in putting a field coil "through the mill."

Substantial Energy Saving on P.R.T.

Cars Operating Out of Callowhill Depot Are Equipped with Meters Which Are Used Both for Economical Operation and for Timing Inspections—Instructors Explain to Men Methods to Be Used in Order to Reduce Amount of Power Consumed—Records Posted in Trainmen's Quarters, Resulting in Great Rivalry to Keep Records Low

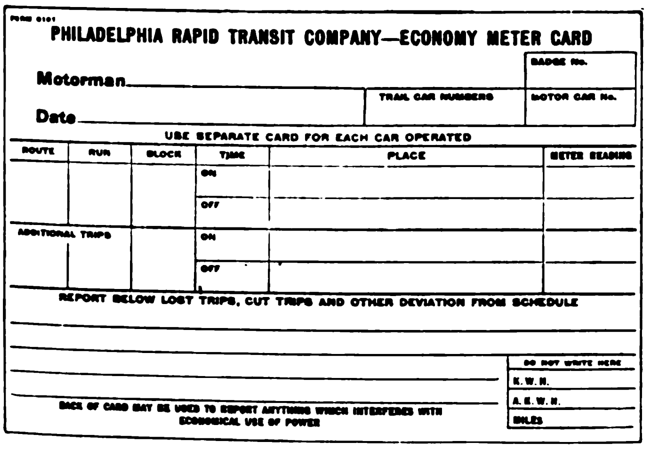


CALLOWHILL DEPOT, PHILADELPHIA RAPID TRANSIT COMPANY

SINCE the middle of last summer the Philadelphia Rapid Transit Company has been operating substantially all cars out of the Callowhill Depot with the aid of Economy watt-hour meters, which are used both in inducing energy saving and in controlling maintenance inspection. Nine complete routes and one partial route are operated from this depot, the total number of cars equipped with meters being 300. A total of 310 meters suffices for this work. The type of meter employed is one equipped with the usual kilowatt-hour dial for reading the car-energy consumption and in addition with three inspection dials, known respectively as A, B and C dials, for indicating when the car equipment is due for inspection.

Installation of the meters was begun at the Callowhill Depot on May 5, 1920, and was completed on Aug. 12. The meters were installed at an average rate of three per day, and as soon as each route was completely equipped the trainmen were asked to turn in a record of meter readings at the beginning and end of each relief, one record card being required for each car on which each man operated. The cards used are of the form shown in Fig. 1, a standard size of 4 in. x 6 in. having been selected for convenience in filing. It will be noted that this card calls for the name of the motorman, the date and the number of the motorman's badge, the motor car, the trail cars, the route, the run and the block. The times and places when and where the motorman takes the car are called for, as well as the meter reading corresponding.

While the meters were being installed, and before the motormen were asked to turn in cards, the readings of all meters already installed were reported each day, together with the corresponding mileage, so as to fur-



PHILADELPHIA RAPID TRANSIT COMPANY—ECONOMY METER CARD

BADGE No.

Motorman

TRAIL CAR NUMBERS

MOTOR CAR No.

Date

USE SEPARATE CARD FOR EACH CAR OPERATED

ROUTE	RUN	BLOCK	TIME	PLACE	METER READING
			ON		
			OFF		
ADDITIONAL TRIPS			ON		
			OFF		

REPORT BELOW LOST TRIPS, CUT TRIPS AND OTHER DEVIATION FROM SCHEDULE

DO NOT WRITE HERE

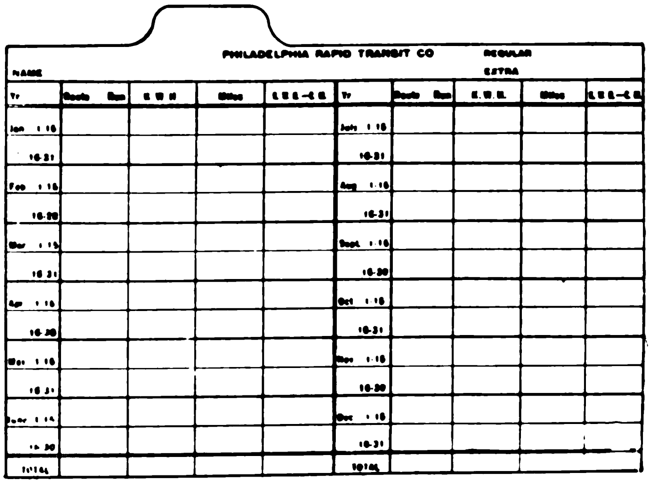
K. W. H.

A. E. W. H.

MILES

BACK OF CARD MAY BE USED TO REPORT ANYTHING WHICH INTERFERES WITH ECONOMICAL USE OF POWER

FIG. 1—CARD USED FOR RECORDING ORIGINAL METER DATA FILED BY MOTORMAN



PHILADELPHIA RAPID TRANSIT CO

REGULAR

EXTRA

NAME

Yr	Route Run	K.W.H.	Miles	K.W.H.-C.M.	Yr	Route Run	K.W.H.	Miles	K.W.H.-C.M.
Jan 1-15					July 1-15				
16-31					16-31				
Feb 1-15					Aug 1-15				
16-28					16-31				
Mar 1-15					Sept 1-15				
16-31					16-30				
Apr 1-15					Oct 1-15				
16-30					16-31				
May 1-15					Nov 1-15				
16-31					16-30				
June 1-15					Dec 1-15				
16-30					16-31				
Total					Total				

FIG. 2—GUIDE USED IN FILING METER CARDS AND IN SUMMARIZING DATA

nish the basis for later determining the saving. Daily records were not available for some of the routes, so that the so-called reference period was estimated by using the total power consumption on each car from the time the meter was installed until the motorman turned in the first record. These records of the performance prior to the time that the motormen began turning in cards were carefully gone over and any items which appeared unreasonable and could not be substantiated were omitted from the result. The meters' dials were in full view of the motormen during this period.

INSTRUCTION AND FOLLOW-UP

Previous to the inauguration of the system on each route an instructor saw each motorman on the route and explained the method of filling out the card, having the motorman fill out a sample. On the morning of the day when the motormen were to begin turning in their records one of the inspectors was on duty at the carhouse to see that each man was provided with a card or cards and that he remembered his instructions in filling them out.

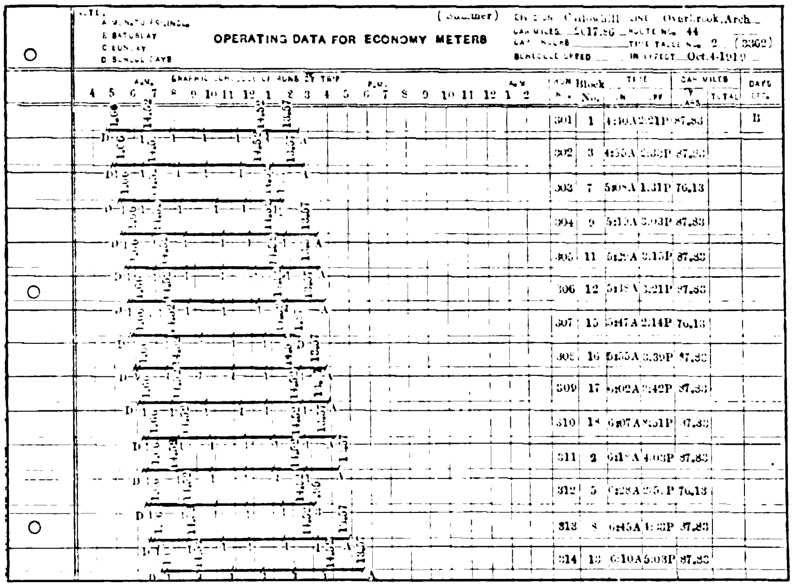


FIG. 3—GRAPHIC SCHEDULE FOR USE IN CHECKING DATA ON METER CARDS

A statement was made up showing the energy consumption per car-mile by each individual motorman, and this was posted in the trainmen's quarters each day for the first three days after the inauguration of the system on each route. Since the first three days the records have been compiled by half-month periods. These statements are posted in the trainmen's quarters within two or three days following the end of each period.

The instructors were given copies of the daily reports for each newly inaugurated route and of the semi-monthly reports for all routes. They rode with the men whose records showed high power consumption and explained the method to be used in order to reduce the amount of power consumed. They also rode with the men whose records showed particularly low power consumption and gave them encouragement to continue their careful operating and to describe their methods to the other men.

The record as posted each half month showed the men classified by type of run and by line, giving the name of the man with the best, or lowest, energy consumption in each class at the head of the list, and showing the others in the order of kilowatt-hour consumption per car-mile.

The men showed considerable enthusiasm and rivalry in trying to keep their records low and accomplished substantial savings almost immediately after they began turning in records.

After the instructors had been engaged in this work for two months they were assigned to give instructions at other depots in order to reduce power consumption on lines running out of those depots in which the cars were not equipped with meters.

At the end of the run the motorman turns in his meter card to the receiver. It is turned over to a clerk, who notes on the meter card the number of kilowatt-hours which have been used and the mileage operated.

The cards are then filed by badge number of motorman, each line being filed in a separate drawer. The cards are filed behind a guide record card like that shown in Fig. 2. This routine work for the 300 cars requires the full time of one girl, but actually two are employed for about half time upon it in order to provide an understudy for the work.

An important part of this routine task is the checking of the motorman's entries and finding and entering on each card the mileage corresponding to the run. A graphic schedule like that shown in Fig. 3 is employed for this purpose. A second chart, like that shown in Fig. 4, is used for quickly making adjustments in mileage in case of extra trips or turnbacks.

At the end of each semi-monthly period the filing drawer for each route is removed from the file and the entries on the cards are totalized for kilowatt-hours and miles for the period by means of an adding machine. The adding machine slips are turned over to a clerk, who computes the kilowatt-hours per car-mile for each man and on each route for each of the three groups of men; that is, for those having early runs, swing runs and late runs respectively.

In the semi-monthly summarizing work four clerks and a stenographer are employed for one and one-half days.

The results are tabulated in uniform style and posted in the trainmen's quarters in from two to three days following the end of the period covered.

PUTTING THE RESULTS IN ATTRACTIVE FORM

For use of the company officials the data are also graphed for each route in the general form represented in Fig. 5, which shows the saving expressed in terms of an average pre-meter-period consumption. The does not allow for seasonal variation in energy consumption per car-mile, which is cared for in the chart reproduced in Fig. 6.

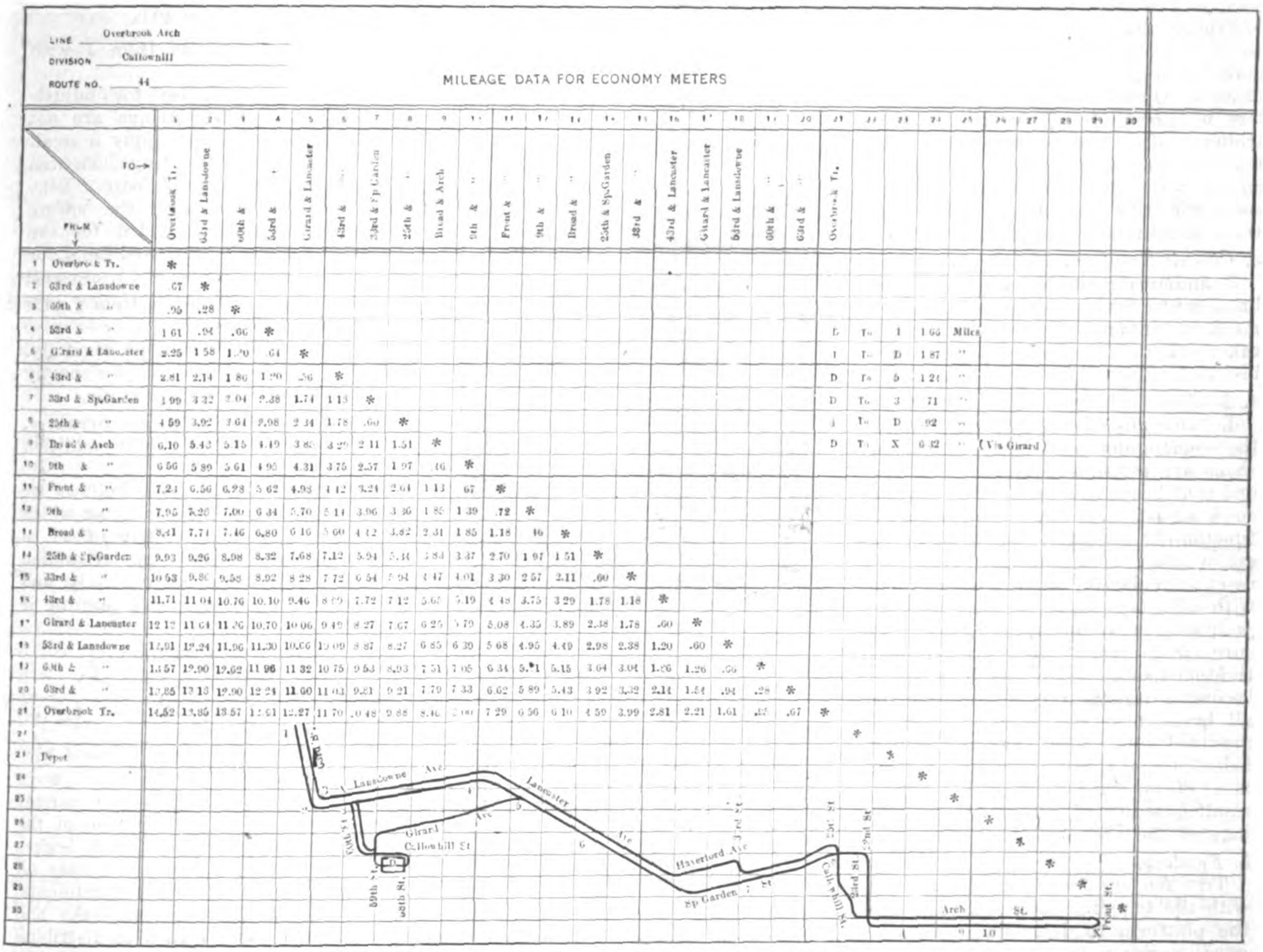
The effect of the use of meters on an individual motorman is graphically shown in Fig. 7, in which a progressive improvement is noted. The motorman whose record is here given started in with an energy consumption higher than the average for the line and at the end of the period recorded had a much lower record than the average, having reduced his energy consumption practically 30 per cent in less than three months.

An important use of the Economy meters is that of making mechanical and electrical car inspections on the basis of kilowatt-hours rather than on the mileage and time basis. These meters have a separate set of three dials for this purpose.

The A, B and C dials are each equipped with a stationary marker hand, or "telltale," enameled red, which can be set at any predetermined point corresponding to that number of kilowatt-hours of energy consumption which may be selected as the limit of inspection of any particular part of the equipment. This setting is simply the kilowatt-hours equivalent of the car mileage inspection interval. The dials also are equipped with meter-driven hands which make one revolution for 5,000, 15,000 and 30,000 kw.-hr. for the A, B and C dials respectively.

In practice the inspection interval markers are so set that the kilowatt-hour intervals on the B dial are multiples of those on the A dial, and those on the C dial are multiples of those on the B dial. Thus the cars are brought in for inspection in accordance with the coincidence of the moving and stationary hands. This brings about the occurrence of ends of two or three inspection intervals at the same time, with the result that cars are not housed so frequently as they otherwise would be. After an inspection has been made the meter-driven hands which announced the inspection are turned back to a stop pin at zero. To do this a key must be inserted in a lock which releases the reset plungers, one for each dial, at the bottom of the meter case; withdrawal of the key interlocks the reset plungers and prevents unauthorized movement of the inspection dial hands. This dial and the reset function independently of the cyclometer type dial, which registers the car-energy consumption.

The mechanical department of the railway has worked out an inspection and maintenance schedule utilizing the dials which is covered in a series of instructions issued to inspectors. These are reproduced on pages 358 and 359. When the inspector checks up the conductors' registers at night he also checks on a form like that shown in Fig. 8 the numbers of cars due for A, B or C inspection. This information is turned over to the carhouse foreman, who orders the cars in as they can be spared. The rolling-stock department records daily inspections by the meter dials on the form shown in Fig. 9.


60th St.
Lansdowne Ave.
Lancaster Ave.
Girard Ave.
Callowhill St.
Haverford Ave.
Sp. Garden St.
Arch St.
Front St.
59th St.
60th St.
33rd St.
22nd St.
Callowhill St.
1
2
3
4
5
6
9
10
X

LINE Overbrook Arch
DIVISION Callowhill
ROUTE NO. 44

MILEAGE DATA FOR ECONOMY METERS

	FROM ↓ TO →	1 Overbrook Tr.	2 63rd & Lansdowne	3 60th &	4 52rd &	5 Girard & Lancaster	6 43rd &	7 33rd & Sp.Garden	8 25th &	9 Broad & Arch	10 9th &	11 Front &	12 9th &	13 Broad &	14 25th & Sp.Garden	15 33rd &	16 43rd & Lancaster	17 Girard & Lancaster	18 52rd & Lansdowne	19 60th &	20 63rd &	21 Overbrook Tr.	22	23	24	25	26	27	28	29	30
1	Overbrook Tr.	*																													
2	63rd & Lansdowne	.67	*																												
3	60th & "	.95	.28	*																											
4	52rd & "	1.61	.94	.66	*																	D	To	1	1.66	Miles					
5	Girard & Lancaster	2.25	1.58	1.30	.64	*																1	To	D	1.87	"					
6	43rd & "	2.81	2.14	1.86	1.20	.56	*															D	To	5	1.24	"					
7	33rd & Sp.Garden	3.99	3.32	3.04	2.38	1.74	1.13	*														D	To	3	.71	"					
8	25th & "	4.59	3.92	3.64	2.98	2.34	1.78	.60	*													3	To	D	.92	"					
9	Broad & Arch	6.10	5.43	5.15	4.49	3.85	3.29	2.11	1.51	*												D	To	X	6.32	"	(Via Girard)				
10	9th & "	6.56	5.89	5.61	4.95	4.31	3.75	2.57	1.97	.46	*																				
11	Front & "	7.23	6.56	6.28	5.62	4.98	4.42	3.24	2.64	1.13	.67	*																			
12	9th "	7.95	7.28	7.00	6.34	5.70	5.14	3.96	3.36	1.85	1.39	.72	*																		
13	Broad & "	8.41	7.71	7.46	6.80	6.16	5.60	4.42	3.82	2.31	1.85	1.18	.46	*																	
14	25th & Sp.Garden	9.93	9.26	8.98	8.32	7.68	7.12	5.94	5.34	3.84	3.37	2.70	1.97	1.51	*																
15	33rd & "	10.53	9.86	9.58	8.92	8.28	7.72	6.54	5.94	4.47	4.01	3.30	2.57	2.11	.60	*															
16	43rd & "	11.71	11.04	10.76	10.10	9.46	8.90	7.72	7.12	5.65	5.19	4.48	3.75	3.29	1.78	1.18	*														
17	Girard & Lancaster	12.12	11.64	11.36	10.70	10.06	9.49	8.27	7.67	6.25	5.79	5.08	4.35	3.89	2.38	1.78	.60	*													
18	52rd & Lansdowne	12.91	12.24	11.96	11.30	10.66	10.09	8.87	8.27	6.85	6.39	5.68	4.95	4.49	2.98	2.38	1.20	.60	*												
19	60th & "	13.57	12.90	12.62	11.96	11.32	10.75	9.53	8.93	7.51	7.05	6.34	5.61	5.15	3.64	3.04	1.86	1.26	.56	*											
20	63rd & "	13.85	13.13	12.90	12.24	11.60	11.03	9.81	9.21	7.79	7.33	6.62	5.89	5.43	3.92	3.32	2.14	1.54	.94	.28	*										
21	Overbrook Tr.	14.52	13.85	13.57	12.91	12.27	11.70	10.48	9.88	8.46	8.00	7.29	6.56	6.10	4.59	3.99	2.81	2.21	1.61	.95	.67	*									
22																							*								
23	Depot																							*							
24																									*						
25																										*					
26																											*				
27																												*			
28																													*		
29																														*	
30																															*

FIG. 4—CHART USED FOR COMPUTING MILEAGE FOR ENTRY ON METER CARDS

In the Callowhill Depot there are the following different types of cars: (1) Near-side cars, equipped with modern motors; (2) the Hog Island cars, equipped with modern motors and type H L control; (3) the pay-within cars, equipped with an old type of motor and type K control. Both the near-side and the Hog Island type cars are equipped with slack adjusters, while the pay-within type is not.

At the present time the setting for the A dial in-

(See continuation on page 360)

Instructions for Inspection of Equipment[*]

Inspection by the A Dial

(ITEMS 1 TO 10)

1. *Trolleys.*

Examine trolley wheels to see that contact springs are in good condition, and that there are enough washers between wheel and contact springs, that the wheel is not flat, and that its diameter is not below the condemning gage. Be sure that trolley catchers and rope are in good condition.

2. *Controllers.*

Replace all controller fingers and segments which are worn to the scrapping point. Blow dust from the controller, after which wipe all grease and dirt from fingers and cylinder, and make a very light application of lubricant. Operate the P C type controllers by power from the master controller (after the main switch has been opened) to determine whether all points are made correctly. Examine contactor tips for wear and put a trace of lubricant on the cams.

3. *Circuit Breaker and Line Breaker.*

Examine circuit breakers and line breakers to determine wear and adjustment of contacts. Note should also be taken of the location of the power-breaking adjustment.

4. *Brakes.*

Replace any shoes that are worn to the condemning point and see that all shoes are properly equipped with keys and that heads are tight. Be sure that slack adjusters, if any are installed, are functioning properly, and that adjusters which are working incorrectly are reset or replaced. On cars not equipped with adjusters make the necessary adjustments with turnbuckles, and make sure that jamb nuts are properly tightened so as to prevent brakes from becoming prematurely slack. See that all brake pins are in good condition, provided with cotter keys and well lubricated, and that the air governor cuts in at 65 lb. and out at 75 lb. Apply a small quantity of grease to side bearings of the slide type.

5. *Fenders.*

Trip fenders from the platform and with the tripping gate, and reset from the platform to determine whether in good working order. Replace broken slats and apply lubrication if needed. Examine screens under the platform on cars of the near-side and Public Service type to see that they are in good condition.

6. *Sanders.*

Examine sand pipes as to alignment with the rail and apply sand to insure that it is flowing freely.

7. *Motors.*

Examine motor brushes for chipping and wear, brush springs for weakness and breakage and commutator for flashover. Any evidence of flashover should be reported to the chief inspector. Apply a wrench to all gear-case and motor bolts to insure their tightness.

8. *Journal Boxes.*

Examine journal boxes for loose lids and have necessary repairs made.

9. *Trap Doors.*

Remove any dirt that has accumulated around trap doors.

10. *Air Compressors.*

Examine air compressors for brush-spring tension and brush wear.

Inspection by the B Dial

(ITEMS 11 TO 24)

Items 11 to 16 like Items 1 to 6 above except for additions as indicated.

13. *Circuit Breaker and Line Breaker.* (Same as Item 3 with the addition below.)

Gage line breaker contactor finger to determine if contact pressure is sufficient.

FRONT PLATFORM OF CAR SHOWING POSITION OF METER

16. *Sanders.* (Same as Item 6 with the addition below.)

Examine valves and piping for leaks.

17. *Wheels.*

Gage wheels for thin flanges and report thin flanges to the shop foreman.

18. *Journal Boxes.* (Same as Item 8.)

19. *Motors.* (Same as Item 7 with the addition below.)

Fill armature and axle bearing with oil to the point indicated by the gage or with the measure provided for the purpose. Examine motor leads closely for poor insulation and properly tape any that are found in bad condition. Wipe carbon dust off brushholders, insulators and yokes carefully.

20. *Trap Doors.* (Same as Item 9.)

21. *Doors.*

Examine doors and steps for adjustment. See that steps are completely up when doors are closed and entirely down when doors are open. Properly lubricate all moving points such as tracks, levels, slides, guides and crankpins. On doors which are operated by an overhead engine carefully wipe out all waste, oil and grease which have accumulated in the engine box. Examine doors which are operated by air engines for speed, and if they are too slow or too fast adjust them.

22. *Engineer's Valves.*

Try engineer's valves and lubricate them if they are not working freely.

23. *Air Compressors.*

Examine air compressors for brush spring tension and brush wear. Oil them if necessary.

24. *Air Governors.*

Examine air governors as to condition of tips and leads, and for air leaks.

Inspection by the C Dial

(ITEMS 25 TO 49)

25. *Trolleys.* (Same as Item 1 with addition below.)

Examine trolley bases for adjustment, *i.e.*, that ball bearings are not becoming too loose, and apply a small quantity of oil to the bearings. Tighten trolley base terminals if loose. Take trolley pole tension with the spring balance or weights provided for the purpose. Examine links and pins for wear. Paint pole and base if necessary.

26. *Controllers.* (Same as Item 2 with addition below.)

Examine cable connections carefully. Replace cylinders which are partly short-circuited across insulators.

27. *Circuit Breakers and Line Breakers.* (Same as Item 13 with addition below.)

Blow out breakers with bellows or dry air from the reservoir, after which apply a very small quantity of oil to the contactor hinge pin. Examine covers of line breakers carefully and make necessary repairs and painting if necessary.

28. *Fenders.* (Same as Item 5.)

29. *Sanders.* (Same as Item 16.)

30. *Brakes.* (Same as Item 4 with addition below.)

Put all release springs in good condition, and replace bent beams, worn heads and worn hangers and hanger brackets subject to the decision of the chief inspector. Apply hand brakes from both ends of the car and make all necessary repairs and adjustments. Examine brake pistons for leaks and give them a quarter turn to distribute wear. Repack slack adjusters with grease provided for that purpose and thoroughly clean threads. Replace slack adjuster rocker arms and fingers that are worn excessively. Thoroughly lubricate the radial bar rollers and all rub plates and replace them if necessary.

31. *Wheels.*

Gage wheels for thin flanges, and also for limit wear of treads, and call the attention of the shop foreman to conditions found.

32. *Journals.*

Examine journal boxes for loose lids and make necessary repairs. Examine them also to see that they have a sufficient quantity of waste well saturated with oil.

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[*] The inspection and repair must be such that, in the opinion of the foreman, the car will stay in service until the next inspection.

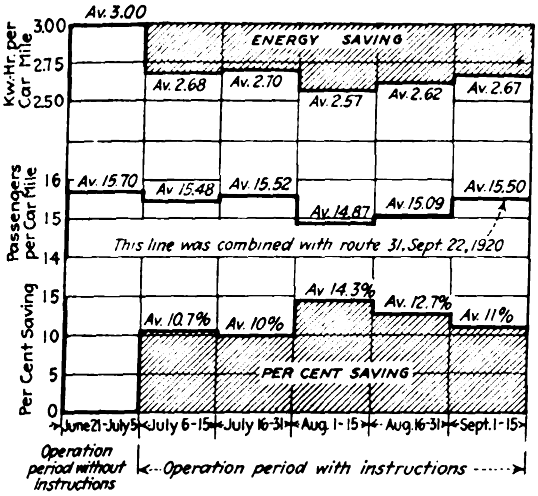


FIG. 5—GRAPHIC PRESENTATION OF POWER OPERATING DATA TO SHOW RESULTS OF USE OF METERS

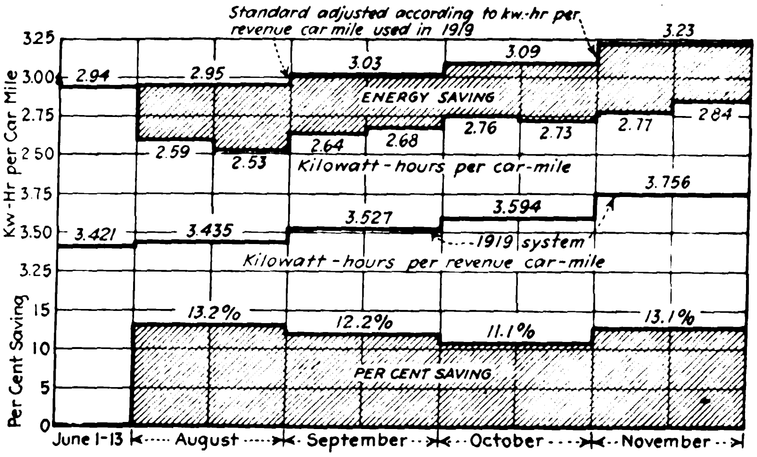


FIG. 6. GRAPHIC RECORD WITH ALLOWANCE FOR SEASONAL VARIATIONS IN ENERGY CONSUMPTION PER CAR-MILE

33. *Trucks.*

Tighten all truck bolts if loose and replace lost bolts. Examine truck frames for bends and breaks and elliptic springs for breaks and cracks. Examine coil springs also. Raise the car body sufficiently to permit the application of a small quantity of grease to center bearings and to side bearings of the slide type.

34. *Drawbars and Couplers.*

Inspect drawbars, drawheads, Tomlinson couplers, and all parts pertaining thereto to see that they are in good working order.

35. *Motors.* (Same as Item 19 with addition below.)

Remove waste from motor oil boxes and replace with new any waste that is in bad condition. Use the waste removed from armature boxes in axle boxes if not damaged from overheating. Examine all oil-box lids as to hinges and springs and axle bearings for wear. Lubricate gears and pinion with the grease provided for this purpose, and in the quantities prescribed by the chief inspector. Examine pinions to ascertain if any are loose or worn to the condemning point. Tighten axle collars if loose, and adjust them if necessary. Examine also suspension bars, springs and bolts. Take armature clearance with the gage provided therefor. Blow out all motors with dry air, after which wipe holders, yokes, commutators and string bands carefully with cloth. Do not use "two-ways" or splice motor leads. Renew leads which are in bad condition.

36. *Trap Doors.*

Remove any dirt that has accumulated around trap doors and make all necessary repairs.

37. *Doors.* (Same as Item 21 with addition below.)

Replace badly worn parts, examine door engines for leaks and repack with grease if necessary.

38. *Engineer's Valves.*

If engineer's valves are not in prime condition take them apart and clean and pack them with grease provided for this purpose.

39. *Air Compressors.*

Examine air compressors for brush spring tension and brush wear. Oil them if necessary. Test compressors for time required in pumping from zero to 75 lb. to determine condition of valves and piston rings. Blow-dust from motor, after which wipe brush-holders and commutator with cloth.

40. *Air Governors.*

Include in the air governor inspection test to determine the pressure at which the governor cuts in and out and make all necessary repairs and adjustments.

41. *Emergency Valves.*

Examine emergency valves, such as used on S. K. and S. P. C. cars, to determine if they function properly by applying engineer's valve to emergency position and noting the quick action of the brake and the time required for full release. If valves are sluggish take them apart and thoroughly clean and properly lubricate them.

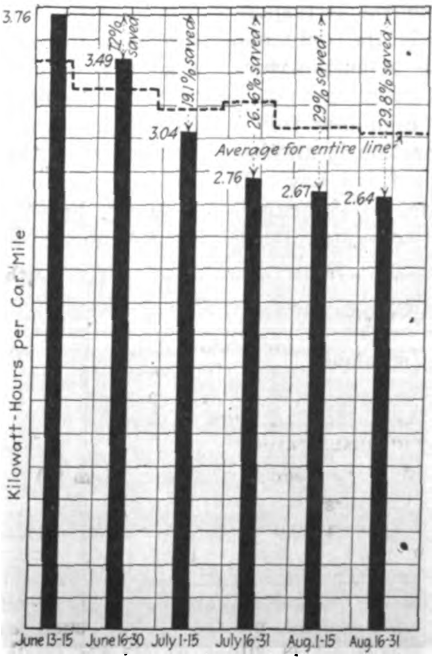


FIG. 7—GRAPH SHOWING EFFECT OF CARE ON PART OF MOTORMAN IN REDUCING ENERGY CONSUMPTION

42. *Gongs.*

Examine gong plungers and clappers for wear and replace if needed and tighten floor plates if loose.

43. *Fuse Boxes.*

Lubricate fuse binding screws if necessary. Examine leads for bad insulation and corrosion at terminals. Paint box if necessary.

44. *Rheostats.*

Examine rheostats for loose or warped grids, loose terminals and hanger bolts, bad leads and connections and make replacements where necessary.

45. *Glass.*

Include in glass inspection all glass in car, such as headlight lenses, red and green light lenses, vestibule windows, door glass, side windows, deck glass and air gage glass. Replace any glass that is cracked or broken and make necessary repairs to all that is loose.

46. *Seats.*

In inspection of seats include a thorough examination of cross-over seat mechanism as well as cushions and backs of all seats. Make replacements and repairs where needed.

47. *Car Body Fixtures.*

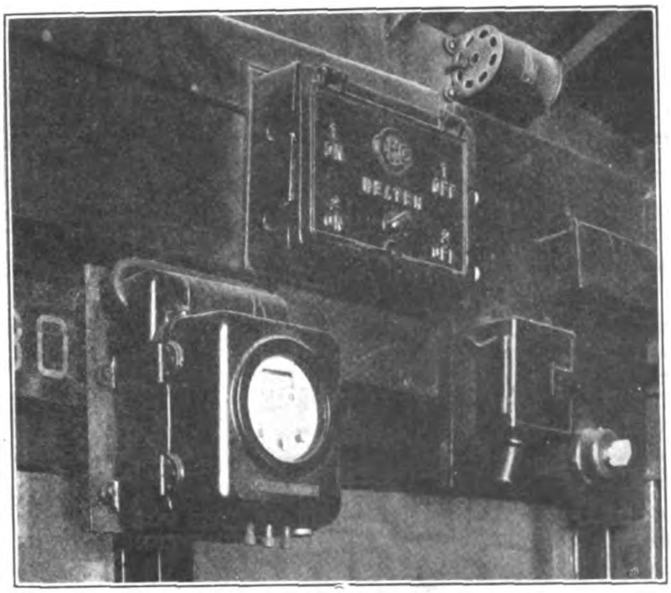
Include in the inspection of car body fixtures the register backs, signal bells, pulleys, push buttons and buzzers, grab handles and hand straps, window screens, signs and heaters. Make all necessary repairs, replace broken parts and tighten loose parts. Examine emergency jacks and lubricate and repair them if necessary.

48. *Switches.*

Include in this item the inspection of all switches, such as air, light, heat, drum, power and all other auxiliary circuit switches, to see that they are in proper working order.

49. *Bus-Line Couplers.*

On cars which are operated in trains or which pull trailers, examine the bus-line couplers to see that the insulation is in good condition. Examine carefully also the supporting springs and attachments and make necessary repairs.



KILOWATT-HOUR METER IN POSITION SHOWING A, B AND C DIALS USED FOR DETERMINING LENGTH OF INSPECTION PERIOD

spection on the near-side cars is 1,500 kw.-hr., for the B dial 6,000 kw.-hr. and for the C dial 12,000 kw.-hr. The setting on the Hog Island cars is, A dial 1,690 kw.-hr., B dial 6,750 kw.-hr. and C dial 13,500 kw.-hr. The setting on the pay-within cars is, A dial 875 kw.-hr., B dial 4,375 kw.-hr. and C dial 13,125 kw.-hr.

Thus it is seen that the interval between A inspections on the cars with the slack adjusters is greater than it is on the pay-within cars, which are not equipped with slack adjusters.

PROCEDURE IN CARHOUSE ROUTINE

Roughly, the plan is to divide the work at the carhouse into units of approximately 100 cars each. In other words, there are three inspection gangs, each of which is in charge of one "inspection leader." Each gang consists of approximately seven workmen, who as nearly as possible are all-round men. The leader is in reality a working foreman and, of course, is responsible for the work of his gang. He is the only one authorized to reset the inspection hands after the work of inspection is completed.

The general plan is to put all the cars due for A inspection in one bay, all due for B inspection in another bay and all due for C inspection in a third bay. If during the work of inspection any part of the car is condemned so that it cannot be readily repaired in the bay it is shifted to what is called the shop bay, where there are facilities such as cranes, etc., for doing various kinds of heavier repair work.

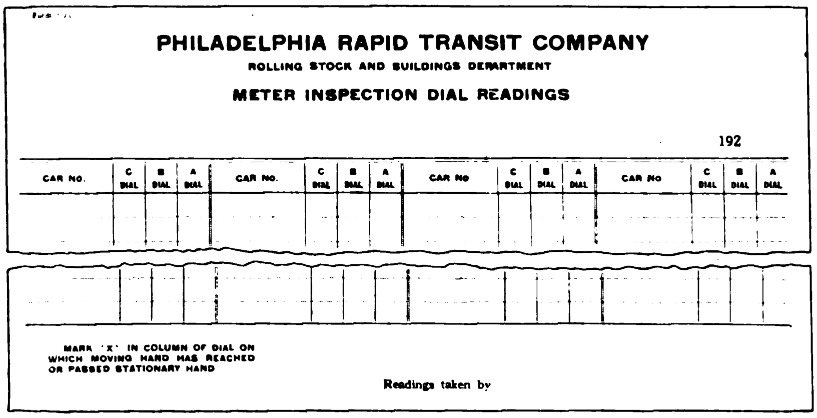
RESULTS SECURED

As shown by the comparison chart for 1920 as compared with 1919 the saving at the car induced by the meters has averaged 12 per cent in actual energy consumption of power distributed from the several substations feeding the West Philadelphia district. The mileage operated within the district fed by a certain group of substations was determined for the months affected both in 1919 and 1920. The reduction in energy consumption at the car for September as compared with May amounted to 8.8 per cent. The corresponding reduction at the substations for the West Philadelphia district was 5.9 per cent. As the mileage operated out of the Callowhill Depot was 31.3 per cent of the total for the district the saving for the Callowhill Division, which is equipped with meters, can be estimated at 19 per cent. The actual saving at the substation board was, of course, somewhere between 8.8 and 19 per cent. To be conservative the company estimates it at 10 per cent.

When operating on the kilowatt-hour inspection basis there is also a saving in maintenance labor due to the reduced number of times the cars come in for inspection. For example, in the semi-monthly period from Oct. 1 to 15 the average number of cars operated was 219. Under the former procedure these would have been inspected every day, a total of 3,285 inspections. Under inspection on the kilowatt-hour basis, the inspections actually made totaled but 602, of which 398 were for items called for by the A dial, 135 for those called for by the B dial and 69 for those called for by the C dial. The average interval between inspections was thus lengthened from one day to five and one-half days.

The reduction in cost of inspection under the new method is estimated at about 6 cents per meter per day. As the energy saving is about 19 cents per meter per day there is a total saving of approximately 25 cents per car per day. This is the net saving after deducting interest and depreciation on the cost of the meters installed, clerical work and overhead which accompany a general reduction in car-energy consumption.

As to the maintenance of the meters, up to the time this article was written no time had been spent on the inspection of the meters. Arrangements are now being made, however, to overhaul them, and this will be done annually hereafter. The total time necessary for the inspection will be about two hours per meter.



PHILADELPHIA RAPID TRANSIT COMPANY
ROLLING STOCK AND BUILDINGS DEPARTMENT
METER INSPECTION DIAL READINGS

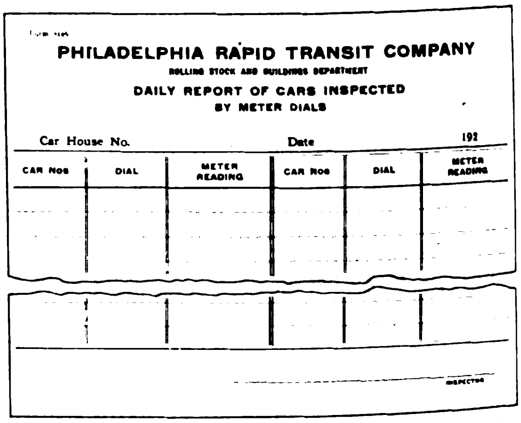
192

CAR NO.	C DIAL	B DIAL	A DIAL	CAR NO.	C DIAL	B DIAL	A DIAL	CAR NO	C DIAL	B DIAL	A DIAL	CAR NO	C DIAL	B DIAL	A DIAL

MARK "X" IN COLUMN OF DIAL ON WHICH MOVING HAND HAS REACHED OR PASSED STATIONARY HAND

Readings taken by

FIG. 8—FORM USED IN REPORTING READINGS ON METER INSPECTION DIALS



PHILADELPHIA RAPID TRANSIT COMPANY
ROLLING STOCK AND BUILDINGS DEPARTMENT
DAILY REPORT OF CARS INSPECTED
BY METER DIALS

Car House No. Date 192

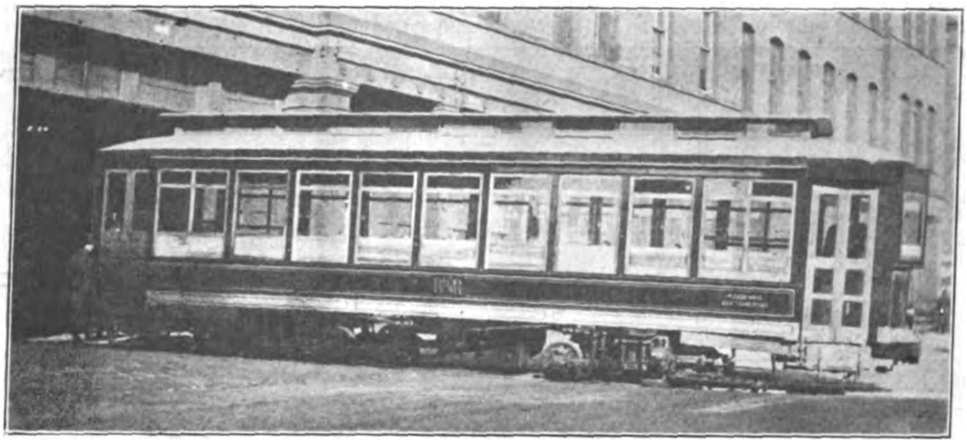
CAR NOS	DIAL	METER READING	CAR NOS	DIAL	METER READING

INSPECTOR

FIG. 9—FORM USED FOR SUMMARIZING RECORDS OF CARS INSPECTED DAILY

One-Man Cars Made from Open Type

Second Avenue Railroad, New York City, Is Reconstructing Some of Its Obsolete Open Cars Into a Particularly Attractive One-Man Type, with Comfort of Passengers a Great Consideration— The Reconstructed Cars Are Provided with Removable Sash So that These May Be Replaced by Screens During the Summer Season



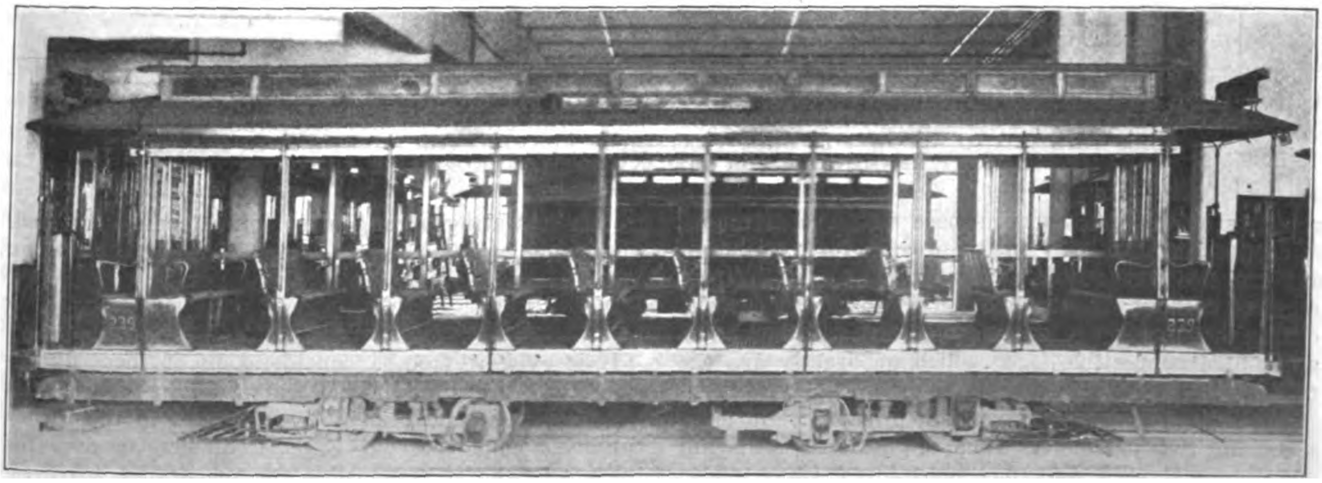
DOUBLE-TRUCK ONE-MAN CAR OF SECOND AVENUE RAILROAD

THE Second Avenue Railroad, New York City, had 100 open cars with twelve benches each which could be operated only in summer, and even then at great operating expense and danger from the multiplicity of accidents inherent to this type of car. The company was in need of more rolling stock of a modern character and decided to remodel these cars for one-man operation. Several have now been reconstructed and the enthusiasm with which they have been received by the patrons of the railway, together with the small cost of their reconstruction, has made the officials of the railway feel that they are an unqualified success. Accompanying illustrations show the process of reconstruction, starting with an open car as it was originally and leading up to the finished cars now in service.

In making this reconstruction the first operation is to remove all of the cross seats, part of the bulkhead, the running board and attachments at the sides, the old-type lighting fixtures and the various routing and destination signs. With the car thus stripped of its seats and operating equipment the reconstruction is carried out by using old parts wherever possible.

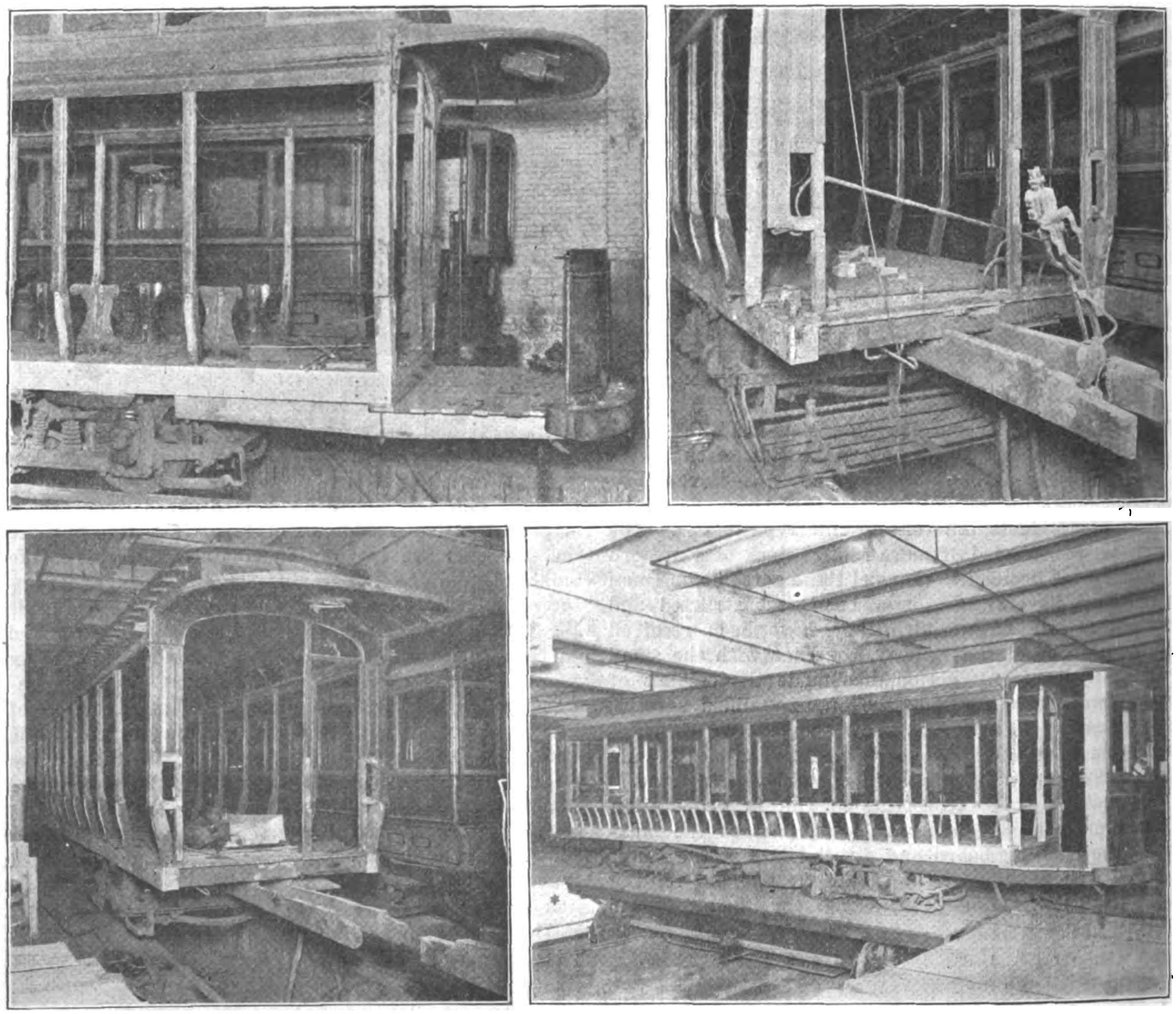
To provide for entrance to the platforms with a single folding step the platforms are dropped from their original position a distance of 7 in. For this purpose the side sills are cut off immediately in front of the bulkhead, and the center sills are cut down and reinforced to help support the new platforms. The side sills formerly consisted of oak, 7 in. x 4½ in., reinforced on each side with steel plates, the outside plate being 8 in. x ¼ in. and the inside plate 6 in. x ½ in. This construction is not changed along the center portion of the car, but at the ends two new oak side sills are added, 8 in. x 3 in. x 9 ft. long. In the reconstruction the platforms are lengthened 4½ in. at each end, making the total length of the reconstructed car 38 ft. 2 in.

The platforms are, of course, entirely inclosed, the construction used being the same as is standard on other types of closed cars for this railway. Folding doors and steps operated by National Pneumatic Company's



OPEN CAR BEFORE RECONSTRUCTION

door engines are installed so as to give a door opening of 30 in. In the construction a number of the corner posts were found to be considerably rotted at the lower ends, and these ends are replaced or reinforced to provide a strong construction. A concave bottom belt panel is installed along the entire length of each side and above this the opening between the original upright posts of the open car is filled in with natural-finish oak panels, the tops of these coming just to the tops of the seats. Above these panels sash are installed for the entire width of the openings between the original uprights of the open cars. These sash are arranged to drop a distance of 7 in. to provide for ventilation and are also constructed so that they can be entirely removed without difficulty and can be replaced by screens during the summer. The remodeled cars will thus be of a one-man convertible type, which apparently are the first of this type placed in service by any railway.



AT TOP, LEFT, RECONSTRUCTED DROP PLATFORM. TOP, RIGHT, END FLOORING AND PART OF BULKHEAD REMOVED AND CUTTING OF SIDE SILLS STARTED. AT BOTTOM, LEFT, SIDE SILLS CUT OFF AT ENDS AND CENTER SILLS TRIMMED TO ALLOW FOR DROP PLATFORM. FRAMING FOR BULKHEAD IN PLACE. BOTTOM, RIGHT, FRAMEWORK FOR CONCAVE BOTTOM BELT PANEL IN POSITION

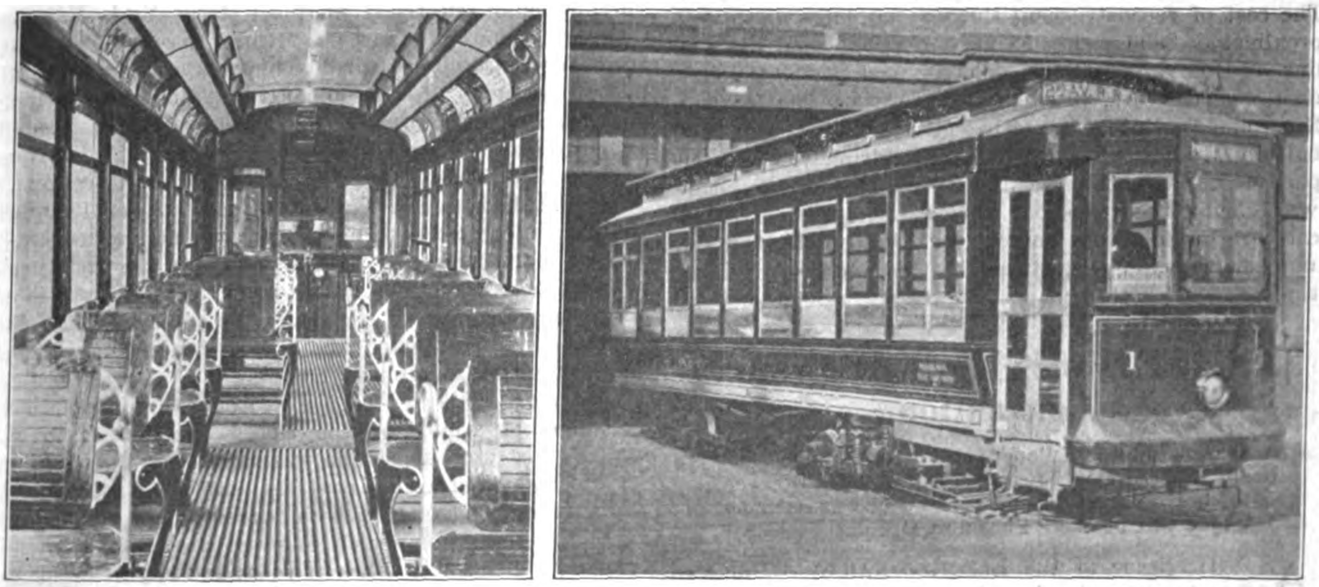
The revised seating arrangement provides eight cross seats for two passengers each, eight cross seats for one passenger each, and four longitudinal seats, one at each corner of the car, to seat two passengers each, making a total seating capacity of thirty-two. All seats are made from the old cross seats, the end castings and other fixtures being used also. The inside end of each of the cross seats is provided with a grab handle made of cast iron and arranged for direct attachment to the end seat fixture. The seating arrangement provides a very roomy car, as the distance from center to center of the cross seats is 35 in. and the aisle width is 25 in. To provide for the aisle width selected seats for but one passenger were necessary. These are installed on opposite sides of the car in the two halves so as to provide a seating arrangement for balancing the load. The larger cross seats are 36 in. long and the smaller ones 19½ in.

LEG ROOM MORE NECESSARY THAN SEATS

It is evident from a consideration of these dimensions that several additional seats could be added if the same seating arrangement as that used in the Birney cars was employed, but C. E. Chalmers, receiver for the road, who is responsible for the design employed, says that he was a passenger on the cars of this road long before he was connected with its operation and that he has a lasting impression of uncomfortable seats and limited leg room. He considers the good will and comfort of the traveling public a far greater consideration than the addition of a few more seats to the cars, and in this reconstruction every attention has been paid to providing a neat, attractive car with as comfortable an arrangement as possible within the limitation of funds available for this reconstruction.

The floors as arranged in the first cars reconstructed have longitudinal floor strips in the aisles and cross floor strips between seats. It is the intention, however, in other cars which are to be constructed to use an Insulite-Mastic floor. This will be carried up a short distance along the sides of the car and at the corners, and will be rounded so as to provide for sanitary cleaning. With this arrangement it will be possible to flush out the interior of the car by turning on a hose without danger of damaging any equipment.

The heating equipment consists of sixteen Gold two-coil cross-seat heaters. These are of special design, as it was necessary to have a short heater for the single cross seats, and in order to make the equipment uniform the same type of heater was used throughout the installation. In the old cars sand boxes were installed under the end seats. In the remodeled cars, to provide for the bulkhead, these sand boxes were moved to a position under the longitudinal seats at the ends of the car. The original sand boxes were foot operated, but the new ones are arranged for air operation.



INTERIOR AND EXTERIOR OF RECONSTRUCTED CAR IN SERVICE

The original lighting arrangement used in the open cars consisted of three five-light clusters on the inside of the car with an additional circuit of five lights distributed on the platform and in the headlights, so that a total of twenty lamps were burning at one time. In the reconstructed lighting arrangement but half this number are burning at one time. A single row of six lights is installed down the center of the car and two additional lights are located on each platform. There is one light in each of the illuminated destination sign boxes and one light in each of the headlights. This makes a total of ten 23-watt lamps which are burning at one time.

The arrangement of the signs has been improved and made to correspond with the standard for the railway. The front glass at each end of the clearstory is lettered "2nd Ave. R.R. Co." In the original open cars an end advertising sign rack prevented light from passing through the end glasses of the clearstory. This has been done away with, so that as at present arranged the lights on the interior of the car illuminate these signs and also provide an attractive car which can be seen a long distance at night. An illuminated destination sign of a roller type, standard with the company, is installed over the front vestibule window and an additional sign reading "Enter at the Front" is placed in the side vestibule windows adjoining the entrance doors. The side panels just to the rear of the entrance doors are lettered "Please Have Exact Fare Ready." The additional lettering used on the car has been made as simple as possible and still is arranged to provide an attractive appearance. A monogram has been substituted for the lettering of the name of the company, which previously extended along the side of the car. The number of the car is placed directly beneath the monogram on the sides and at each end of the car on the right-hand side of the dasher.

The signal installation consists of a push button installed on the upright post between each pair of windows along the sides, with two additional push buttons at the ends of the car. This makes a total of eighteen buttons. Buzzers are provided for signaling the operator. The entire signal installation is of the Consolidated line-voltage type.

In painting the car particular attention has been given to making it attractive and clean. The outside of the car is finished with Pullman green and white, with natural finished oak panels underneath the windows. The interior is finished in cherry and white, with some additional gold striping to improve the appearance. The bird's-eye headlining has been refinished with white enamel. This provides better lighting and also gives an attractive appearance. The seats are finished with a cherry stain, and in fact all of the other interior woodwork and fittings are finished with this cherry stain. Even the cover of the controller, which is of wood, has this. The seat castings, which receive the roughest usage of any part of the equipment, are painted black with gold striping. The floor is painted green.

The original open cars were provided with air brakes, so that the same air-brake equipment has been retained, as well as the original control equipment. In the rewiring of the car it was found possible to use the same cable for the length of the car, as this was long enough to drop down underneath the lower platform and still reach the controllers.

The control is interlocked with the doors, so that the car cannot be started until the doors are closed. The National Pneumatic door engine is installed over the top of the doors and is operated pneumatically from a valve just to the left of the motorman's brake valve. In order to give greater platform space and provide room for the entrance and exit of passengers a drop brake handle is used. On entering the passengers deposit their fares in a Johnson farebox, which is located just to the right of the entrance opening and within easy reach of the operator.

The cars as reconstructed are 38 ft. 2 in. long and weigh approximately 25,000 lb. completely equipped. The cost of reconstructing the first cars has been approximately $800 each. At present the Second Avenue line of this railroad is completely equipped with one-man operated cars, which operate between the Harlem River and Tenth Street and Broadway. A four and one-half-minute headway is maintained during the greater part of the day with a two and one-quarter-minute headway during the rush-hour period. The reconstructed cars are proving very popular with the public, and the number of passengers carried by this line is increasing rapidly.

A. I. E. E. Holds Ninth Midwinter Convention

A Number of Important Papers on Power Distribution Were Read, and Motion Pictures of Circuit Breakers, Switches, Current Transformers and Fuses Under Short Circuit Were Shown at Opening Session

AS THIS issue of the ELECTRIC RAILWAY JOURNAL goes to press the American Institute of Electrical Engineers is in session in New York City at its midwinter meeting, a convention which has come to occupy an important place in the organization's activities. The program included several papers covering matters which have application particularly in electric railway power distribution. These represented part of the work of the Institute's technical committees which handle the highly specialized subjects in the several divisions of the field of electrical engineering.

The convention opened on Wednesday evening with the presidential address of A. W. Berresford, vice-president Cutler-Hammer Manufacturing Company, Milwaukee, Wis. Preceding the opening session the delegates spent the afternoon in visiting local power plants and other points of engineering interest.

In his address President Berresford noted first the tendency of specialists toward segregation, and said that if the A. I. E. E. had not previously been formed it would have been organized at this meeting due to the necessity for conference on technical problems. He then defined the real professional engineer as one who has caught the vision of the value of achievement for its own sake, of the importance of the work done rather than its return to the worker. The standing of electrical engineering as a profesion, he said, is illustrated by the devoted work of the A. I. E. E. committees.

PAPERS ON CIRCUIT BREAKERS AND SWITCHES

The papers of Wednesday evening had been prepared and were presented under the auspices of the protective devices committee, D. W. Roper, superintendent street department Commonwealth Edison Company, Chicago, Ill., chairman. H. R. Woodrow, Stone & Webster, Inc., Boston, Mass., presented the report of the sub-committee on oil circuit breakers and switches. This embodied the results of a questionnaire on oil switch requirements, and covered rated voltage, rated continuous current-carrying capacity, rated momentary current-carrying capacity and rated interrupting capacity. The committee made suggestions as to design under these heads.

REMARKABLE MOTION PICTURE OF SWITCHES AND FUSES IN ACTION

Following the reading of Mr. Woodrow's paper, Philip Torchio, chief electrical engineer New York Edison Company, read a paper on "High-Current Tests on High-Tension Switch Gear." This was accompanied by motion pictures of the apparatus "under fire," the switches being clamped in the closed position and subjected to short-circuit currents of great magnitude. The tests, which covered several varieties of circuit breakers, fuses, etc., had been conducted during 1918 and 1919 by the Edison company engineers with the active co-operation of manufacturers. In the tests, for the first time a synchronized motion-picture machine and an oscillograph were coupled to reproduce the coincident actions of the apparatus tested and the variations in voltage and current in the circuit.

The most striking feature of the exhibit was that considerable arcing of the closed switches occurred under short circuits, which was caused by the opening of the main and arcing contacts due to the mechanical force resulting from the high current.

In the discussion which followed the reading of the papers, the characteristics of fuses and circuit breakers were pointed out, one speaker telling of a fuse in which the fusible wire is in part inclosed by cement blocks distributed along its length, with intervening exposed sections of the wire. This was said to operate successfully, the exposed wire going first and the inclosed wire later, the metal of the latter being absorbed by the cement. The carbon tetrachloride fuse was also mentioned. One speaker traced briefly the history of the circuit breaker, showing how the rapid increase in power-plant capacity had imposed severe requirements upon this vital element of the equipment.

On Thursday a number of papers relating to power cable problems were read. Some of these will be abstracted in a later issue of the ELECTRIC RAILWAY JOURNAL.

It is now possible to obtain from the Bureau of Standards bulletins Nos. 395, 396 and 397 in its series of scientific papers. These cover respectively the relation of the high-temperature treatment of high-speed steel to secondary hardening and red-hardness, the thermal and physical changes accompanying the heating of hardened carbon steels and a study of the relation between the Brinell hardness and the grain size of annealed carbon steels.

American Engineering Council Reports Progress

L. W. Wallace Elected Permanent Executive Secretary at Meeting at Syracuse on Feb. 14—Committee Organization and Assignments Crystallized—President Hoover Outlines Industrial Survey

AMERICAN Engineering Council held its second regular meeting at Syracuse on Monday, Feb. 14, at which time considerable progress was made in perfecting the organization of the committees and committee work. Also the appointment of the permanent secretary was agreed upon.

In the evening a Hoover dinner was given at the Onondaga Hotel to the members of American Engineering Council, of the Council of the A. S. M. E. and of the Technology Club of Syracuse.

The permanent committee on the elimination of waste in industry as appointed by President Hoover consists of the following members: J. Parke Channing, mining engineer, New York, vice-president American Engineering Council and member A. I. M. & M. E., chairman; Dr. Ira N. Hollis, president Worcester Polytechnic Institute, past-president A. S. M. E.; L. W. Wallace, Baltimore, member A. S. M. E., member and president Society of Industrial Engineers, secretary American Engineering Council; H. R. V. Scheel, assistant treasurer Brighton Mills, Passaic, N. J., member A. S. M. E.; L. P. Alford, editor *Management Engineering*, New York, vice-president A. S. M. E., director Society of Industrial Engineers; George D. Babcock, Peoria, Ill.; F. G. Coburn, Bethlehem Shipbuilding Company; Morris L. Cooke, consulting engineer, Philadelphia, member A. S. M. E., Taylor Society and Society of Industrial Engineers. Harrington Emerson, consulting engineer New York, member A. S. M. E. and Society of Industrial Engineers; E. E. Hunt, New York, member Taylor Society; C. E. Knoeppel, industrial engineer, New York, member A. S. M. E. and Society of Industrial Engineers; Robert Linton, mining engineer, Montana, member A. I. M. & M. E.; Fred J. Miller, past president A. S. M. E.; J. H. Williams, New York, member Taylor Society; Robert B. Wolf, New York, vice-president A. S. M. E.

Mr. Hoover, president of American Engineering Council, is also a member of the committee. Mr. Hoover is a member A. S. C. E. and A. S. M. E. and president A. I. M. & M. E. The committee has already started work and will put into operation from the New York and Washington headquarters of the council a nationwide plan of study. This is probably the most ambitious movement in the solution of economical problems which has ever been undertaken by American engineers.

The council has adopted a definite program encouraging the development of local engineering organizations, and in line with this policy will expect local organizations to take a good deal of responsibility in their localities in the various pieces of work which American Engineering Council undertakes.

The council is also working toward a worldwide coordination of the engineering associations. It has changed its committee on Russian affairs into a committee on international relations.

One important piece of work was the election, by unanimous vote, of Lawrence Wilkerson Wallace to be secretary of the council. Mr. Wallace succeeds L. P. Alford of New York, who has been acting secretary since the formation of the council last November.

Mr. Wallace was born in Austin, Texas, August 5, 1881. He was graduated from the Agricultural and Mechanical College of Texas in 1903 with the degree of B.S. in Mechanical Engineering and received the degree of M.E. from Purdue University in 1912. From 1903 to 1906 he served a special apprenticeship with the Santa Fé Railway and was a member of the Purdue faculty from 1906 to 1917, becoming head of the department of railway and industrial management. During this period Mr. Wallace conducted researches and did consulting work in railway mechanical engineering and factory management. For several years he investigated fire losses from locomotive sparks and gave expert testimony in many fire cases.

L. W. WALLACE

Mr. Wallace is an author of technical works and his volume on "Car Design" is used as a textbook as well as generally by designers. He also has written special instruction books for railway educational departments and papers on engineering and management topics before railway and management societies. He was formerly assistant general manager in charge of production of the Diamond Chain & Manufacturing Company of Indianapolis. More recently he has been director of the Red Cross Institute for the Blind in Baltimore.

Mr. Wallace is a member of the American Society of Mechanical Engineers and the vice-chairman of the society's management section. He is now serving his third term as president of the Society of Industrial Engineers.

The temporary headquarters of the council in the Engineering Societies Building, New York City, will soon be transferred to Washington, where the council has established permanent national headquarters in the McLachlen Building.

The council gave formal approval to the action of the committee on procedure requesting that President Harding put an engineer on the Interstate Commerce Committee. The committee was authorized to name six qualified engineers when requested to do so. Activity in behalf of a National Department of Public Works will be continued by the council through the public affairs committee. It was recommended that engineering efforts be extended to the whole question of government reorganization.

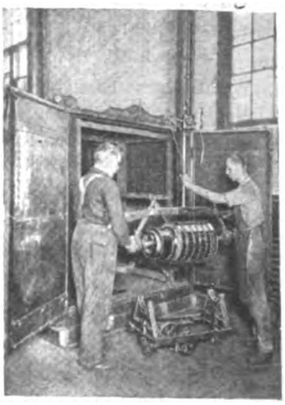
The plan for the registration of engineers as presented in the council's report was indorsed and the appointment of another committee was authorized. The Russian affairs committee was made a new committee on international relations.

The council decided to recommend to President Harding that an engineer be appointed assistant secretary of war. No action was taken relative to the national civic federation, fuel conservation or merchant marine committee appointments. The committee on public affairs was authorized to recommend the congressional appropriation to investigate deeper waterways.

At the dinner in the evening President Hoover delivered an address outlining his ideas on the work of the committee on the elimination of waste in industry.

Shop, Track, Power and Line

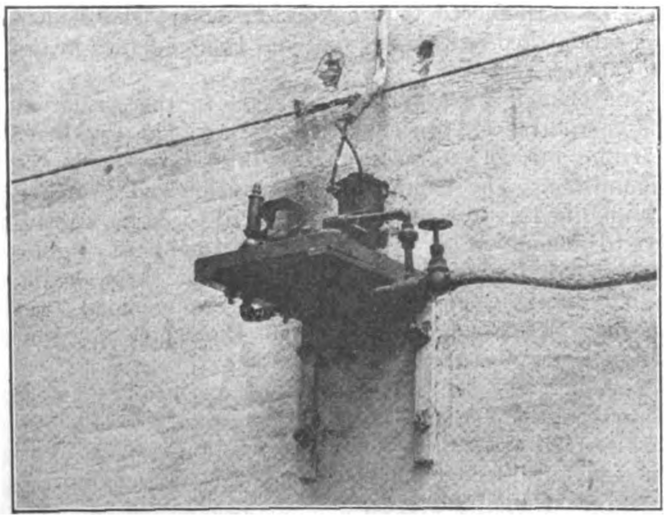
These Articles and Ideas Are from Men on the Job Who Find Special Applications and New Methods an Incentive for Greater Effort — If You Have Something Good Pass It Along



Convenient Shop Call System

When a call comes for a shop foreman while he is attending to some duty in the inspection shop, overhauling shop, storage yard or other place connected with his department the problem of locating him is sometimes a serious one. Many railway shops use a loud-sounding gong or whistle as a signal and sound a different number of blasts or signals to designate different department heads and indicate that their presence is required in the office. With such a system the person signaled must go to the office to learn what is wanted, and as a loud alarm is necessary to reach all parts of the shops or yards this disturbs workmen and distracts them in the performance of their duties.

The Third Avenue Railway, New York City, has a shop call system in its Sixty-fifth Street shop that has proved very satisfactory for such service. Telephones have been located at various convenient points throughout the shop and small whistles electro-pneumatically operated are scattered throughout the building. These whistles are operated from the telephone switchboard by pressing a key. As they are connected in parallel, they all sound the same signal and the person called can find out what is wanted or can answer any outside call by going to the nearest telephone. By this arrangement the signaling whistle can be made very small so as not to prove a disturbing factor for other workmen.

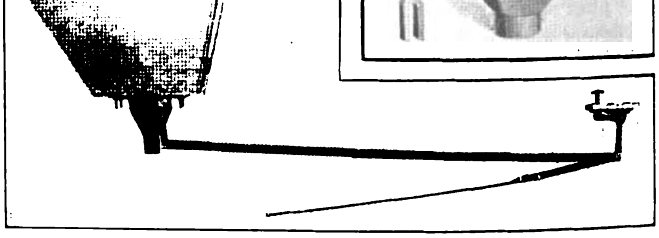


WHISTLE AND MAGNET VALVE FOR SHOP CALL SYSTEM

The mechanism for operating the various whistle signals consists of a magnet valve taken from an old electro-pneumatic switch group and connected to the whistle. When this magnet valve is energized electrically air is admitted to the whistle pipe and so sounds the signal. The magnet valve, together with the whistle and piping, is mounted on a bracket high up on the wall so as to be out of reach of employees and in a location where the signal will be easily heard. With this system in use a man need no longer be tied down to his desk. If his work takes him on frequent visits to other departments he can go with an easy mind, knowing that if he should be needed he can be readily located and that he can communicate with the office without making it necessary to walk the entire length of the yards and shops to find out what is required.

Mechanical Sander for Safety Cars

A foot-operated mechanical sander has been put on the market by the Nichols-Lintern Company, Cleveland, Ohio, which advocates its use as a safety feature on the safety car, to insure the sanding of the track even if the air pressure fails. Accompanying illustrations show a hopper with the sand valve attached and the connections necessary for operating it, also a larger view of the sand valve proper. The complete sand valve is attached to the bottom of the hopper, and the lever at the side is pulled by the action of the pedal. Through a cam it causes a vertical movement of the valve which is attached to the threaded stem, thus making an opening for the sand to flow through. The pronged part of the valve, through its up-and-down movement, prevents bridging of the sand. A strong spring is located under the top cap. This spring closes the valve when the foot



SAND HOPPER WITH FOOT-OPERATED SAND VALVE MECHANISM pressure is released. The working mechanism is completely inclosed within the valve and the cam is within the sand hopper, protected from any outside influence, thus insuring against the rusting of the moving parts.

Fighting Snow in Winnipeg

SOME of the snow-fighting equipment used by the Winnipeg Electric Railway, Winnipeg, Man., is shown in the accompanying illustrations. Snow conditions in Winnipeg are rendered especially trying due to the extremely low temperatures encountered and the dryness of the climate. Heavy winds usually accompany the low temperature and the snow, which is light and dry, drifts readily. This makes it very difficult to keep the tracks clear of snow and as a result it is necessary to operate the sweepers more miles per year than in cities where climatic conditions are more favorable. While the snowfall in Winnipeg is not as heavy as at other points in Canada, yet the sweeper mileage is considerably greater than on most systems of the size of the local railway.

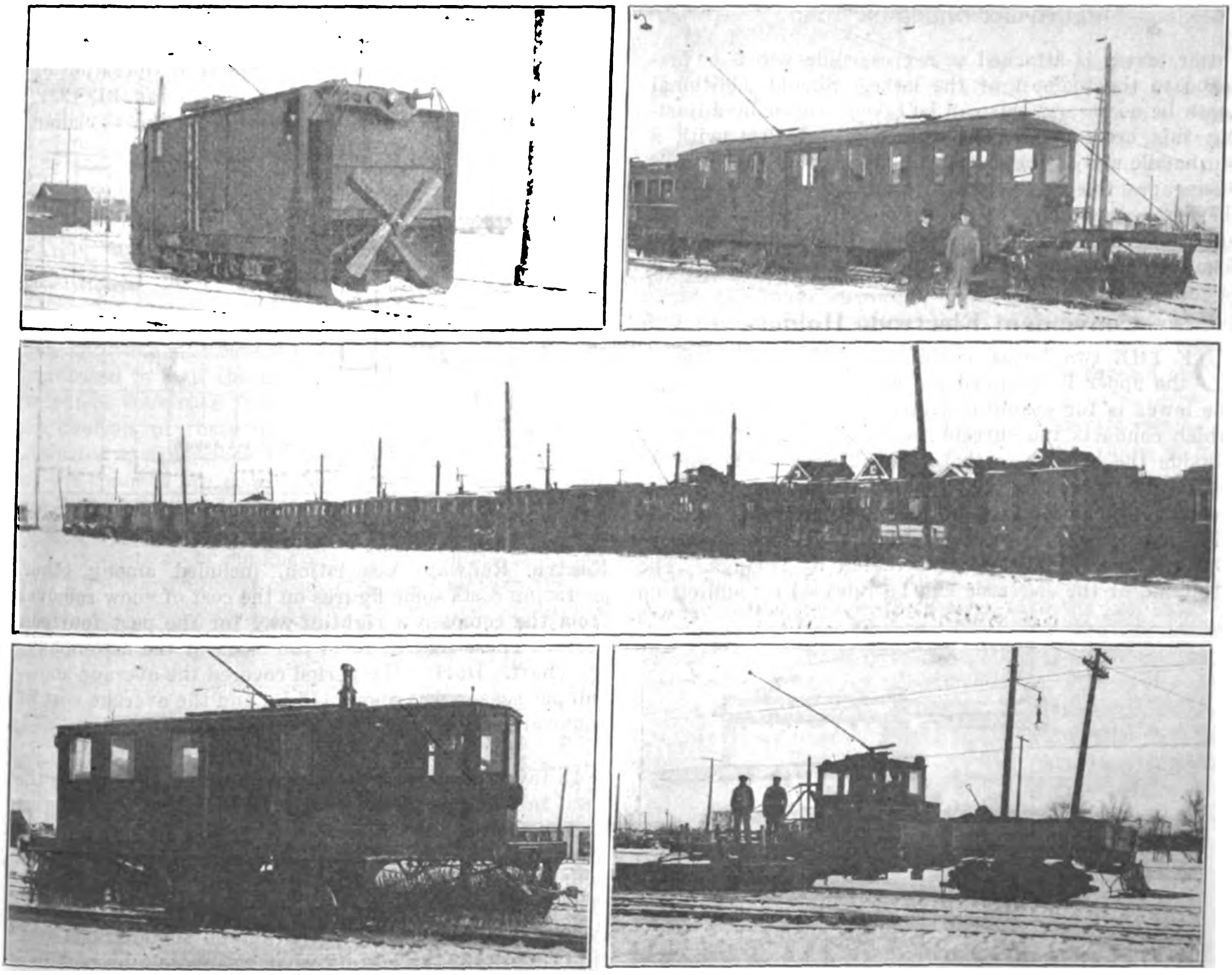
The snow-fighting equipment proper used in Winnipeg consists of one rotary plow, one large double-end sweeper and nine double-end single-truck sweepers. This equipment is all of McGuire-Cummings make, imported from the United States. In addition to this equipment the company also has some auxiliary equipment made in its own shop. This consists of one work car, which is equipped with a 14-ft. wing and is operated by air control for clearing back the snow. This wing as attached to a flatcar is shown in one of the illustrations. Other cars operating on suburban lines are equipped with 14-ft. nose plows attached to the trucks and arranged for lowering and lifting by the motorman from his cab.

Life of Track Files Increased by Acid Sharpening

FILING new rail joints on the lines of the United Railroads of San Francisco has been done for many years with Vixen files, a type whose manufacture was recently discontinued. Inquiry developed the fact that the nearest substitute for these files would cost $18 each.

Some experiments were thereupon made with the acid sharpening process for reclaiming the dulled Vixen files on hand. It was found that if the dulled files were soaked in dilute sulphuric acid for eight hours, the cutting edges would thereby be sharpened to the extent that the file was good for about 30 per cent of the amount of service that could be obtained from a new file.

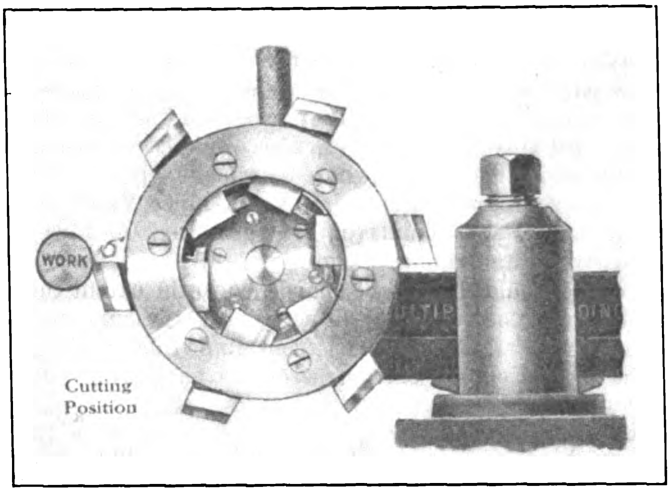
The acid used for the purpose was chemically pure sulphuric acid diluted with twice its volume of pure water. Watertight redwood boxes were found to be the most convenient containers in which to immerse the files.



TOP, LEFT, LARGE ROTARY SNOWPLOW. TOP, RIGHT, DOUBLE-TRUCK, DOUBLE-END SWEEPER. CENTER, A LINE OF SNOW-FIGHTING EQUIPMENT IN THE STORAGE YARDS. BOTTOM, LEFT, SINGLE-TRUCK, DOUBLE-END SWEEPER. BOTTOM, RIGHT, WORK CAR WITH 14-FT. WING ATTACHED

New Type Threading Tool

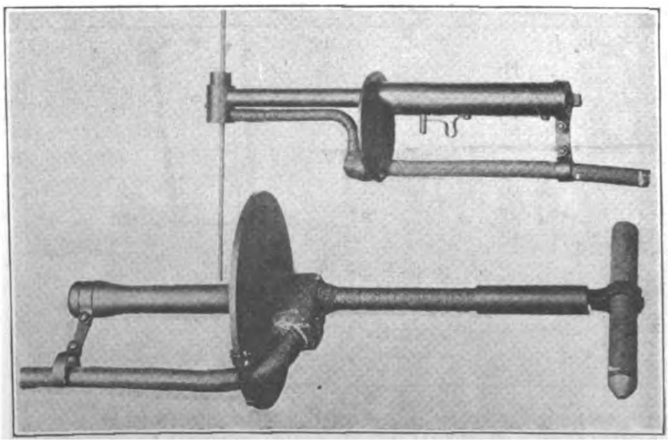
THE Cruban Machine & Steel Corporation, New York, N. Y., is placing on the market a new type of multiplex threading tool. This consists of a cutter turret, in which are mounted six cutting tools arranged so that as the turret is rotated each succeeding knife takes an additional depth of cut, and one complete rotation of the turret is sufficient to cut any thread up to No. 12 pitch without additional adjustment. The cutter turret is attached to a cross-slide which is fastened to the toolpost of the lathe. Should additional depth be necessary, this can be taken care of by adjusting this cross-slide. The turret is provided with a pin handle and at the end of a cut a pull on this handle disengages the cutting knife from the work and sets the succeeding knife in proper position for taking the additional depth of cut necessary. Each knife is held firmly by a locking screw at the bottom of the knife.



MULTIPLEX THREADING TOOL

Convenient Electrode Holders

OF THE two forms of electrode holders illustrated, the upper is designed for metallic electrodes while the lower is for graphite electrodes. In each the cable which conducts the current to the electrode is carried outside the handle, so that a small-sized cable can be used without causing the handle of the holder to become heated to an uncomfortable temperature. The metallic electrode is held by means of a plunger which passes through the tubing and is actuated by springs. The stub end of the electrode can be released by pulling on the trigger shown immediately under the handle of the electrode holder.



HOLDERS FOR METALLIC AND GRAPHITE ELECTRODES

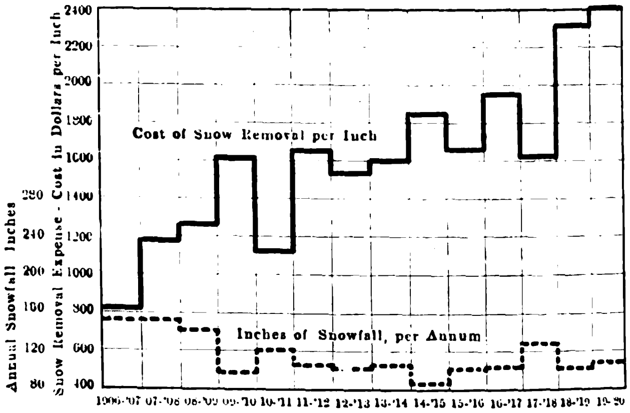
The graphite electrode can be readily removed and replaced by rapping the two jaws, which are merely slipped back into the tubing. These jaws consist of two pieces of cold-rolled steel bent into proper curved shapes to fit the electrodes and are forced back into the tubing, which clinches them together, causing them to hold the electrodes securely. If these jaws should become burned while in service they can be quite readily replaced by forming up a couple of jaws from steel or iron.

Registers Replace Ticket Agents

THE Brooklyn Rapid Transit Company has purchased fifty Rooke automatic registers for use in collecting fares on the rapid transit lines running between Sheepshead Bay and the Stillwell Avenue terminal at Coney Island. During the winter season shuttle service is used between these two points and the ticket agents at stations intervening that are ordinarily required have been done away with through the use of these registers. The fares are collected by collectors who board each train as it leaves the terminal and collect all fares while in transit. This method is working out very satisfactorily.

Snow-Removal Costs in Montreal

COL. J. E. HUTCHESON, general manager Montreal Tramways, in his paper on "Practical Operation of a Service-at-Cost Contract," presented on Jan. 31, 1921, at the seventeenth annual convention of the Canadian Electric Railway Association, included among other operating costs some figures on the cost of snow removal from the company's right-of-way for the past fourteen years. These figures form the basis of the accompanying chart. During the period covered the average snowfall per season was about 115 in. and the average cost of removal per inch was $1,615.



SNOWFALL DATA FOR MONTREAL, QUE.

In investigations made in England with regard to the loss in weight of overhead electric railway contact systems by corrosion and wear it has been found that the heaviest corrosion was on a section of the line over which both steam and electric trains were worked. There the loss averaged approximately 0.82 per cent per year. On a line where there was no steam travel tests indicated that the loss by wear was closely proportional to the density of electric train traffic over the line, and in spite of the very heavy service over this line the wear averaged but 0.3 per cent per annum.

Tendencies in Safety Car Design

Comments on a Previous Article, Outlining Changes in Construction that Have Been Made, Show Diversity of Opinion Regarding Their Desirability—Other Articles on the Same Subject Follow the Letters

SEVERAL letters and other short articles relating to the safety car having been scheduled for publication in this issue of the ELECTRIC RAILWAY JOURNAL, they are gathered together under the above general caption for the readers' convenience.

Letters to the Editors

J. G. BRILL COMPANY
PHILADELPHIA, PA., Feb. 5, 1921.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 15, 1921, page 127, there is published a staff article on the "Trend of Safety Car Construction" which is not only misleading to those unfamiliar with the entire question of the standardized Birney safety car, but is also liable to create such erroneous impressions as will be detrimental to both the manufacturers and the railway operators themselves.

Since the standard Birney safety car was designed there have been many suggestions made which, in the opinion of those making them, would improve the standard construction, but in most cases the increased weight would more than offset any advantages which might be obtained. In some cases when safety cars are ordered the specifications are made to read "standard Birney safety cars, except ——," but it must be borne in mind that where the weight of the car was increased the saving in power, increased acceleration and other advantages of the standard car suffered. Of the twenty-three changes or departures from the standard Birney safety car reported, most of them were included in a few cars and all were not included in all of the cars purchased by half the companies sending in reports, as might be construed from the article in question. Also, an analysis of these departures or changes from the standard specifications reveals that at least 50 per cent of the changes are either now included in the standard car or are essentials determined by climatic conditions which could not very well be retained as a standard. Take, for instance, the heaters. It is illogical to expect that a standard number of heaters could be furnished in Birney safety cars regardless of the climatic conditions. Then, again, in severely cold regions double floors or storm sash may be necessary and should be furnished, but they would involve superfluous weight in warmer climates.

As to the heavier truck, this was adopted some time ago and is adequate for the service. The light-weight truck was designed to carry a limited load, but after a time it was considered advisable to provide a truck with greater carrying capacity than the limited load of the lighter truck.

It is to be expected that the standard Birney safety car will from time to time show progressive improvements in the way of refinements, which will be incorporated at such times that the advantages of quantity production and standardized parts will not be lost. Some refinements have been made, but the general plan, length, width and other dimensions of the standard car remain the same as originally designed after an exhaustive study of the requirements of street railway transportation. The statement in the sub-heading of the article referred to, that "A review of the more recent changes in safety car design points toward the development of a type with increased capacity, etc.," is not borne out by the facts, which are recognized in the last paragraph of the article by the statement, that the "most general feeling in regard to standardization on this particular car seems to be that the present general dimensions of length, width, height and general capacity are satisfactory." I know that you desire to present the standard Birney safety car to your readers with the correct perspective, and for this reason the publication and spirit of this letter will be appreciated.

W. H. HEULINGS, JR.,
Vice-President and General Manager of Sales.

MEDFORD, MASS., Jan. 27, 1921.

To the Editors:

I have been interested in the articles which have recently appeared in the ELECTRIC RAILWAY JOURNAL with reference to the tendencies in design of safety cars. From the expression of these articles it is apparent that a number of street railway men do not give sufficient regard to the conditions which confront the street railway today.

The basic consideration in car design should be that the electric railways no longer have a monopoly of the urban passenger business. The successful car must be designed to meet the competition of the bus.

Barring infrequent stop service over reserved right-of-way passenger transportation may be carried out in two ways, viz.: (a) By transporting passengers in small groups at frequent intervals at moderate speeds, or (b) by transporting passengers in large groups at less frequent intervals at slower speeds. Service (b) is often called mass transportation.

I look forward to the time when, by the equalization of paving and tax burdens, adjustments of fare, and other means, service (b) may be offered to the public at rates which will in themselves take the majority of riders from competing buses, just as service (a) by its frequency and speed is taking riders from its competitors. But in the larger cities service (a) and service (b) cannot be given at the same time over the same tracks. It is obviously impossible to run a 9 or 10 mile-per-hour safety-car schedule over tracks which carry a number of large cars or trains operating at 7 or 8 miles per hour.

It is, therefore, imperative that car design be preceded by a decision as to the service in which the proposed car is to be used. Is the car to be used for mass transportation at slow speeds or is it to be used for service with small units at moderate speeds? Mass transportation requires large cars, trailers or multiple-unit trains. Moderate speed service requires buses, trackless trolleys or cars with speed characteristics at least equal to those of the present safety car.

The ability of the standard safety car to operate at bus-competing speeds is the result of a high ratio of motive power to car-weight and a low ratio of stops to car-miles. Any increase in the weight of the standard car will require larger motors than are now used. To operate the larger motored car at the better schedule speeds of the present car will increase operating expenses and fixed charges more than $1,000 per car per annum; a prohibitive amount. The increased weight will thus force a decreased schedule speed, which in turn will increase platform expense and investment in cars while driving business to our competitors, and we will head back toward the condition of heavy cars and empty seats, which we hope is forever behind us.

Let us devote our energies rather to reducing the weight of the present standard car, for which effort we will be rewarded by decreasing ratios of operating expenses and investment to gross earnings.

The case against increasing the capacity of the safety car is a strong one. The wisdom of Mr. Birney's selection of thirty-two as the seating capacity of the safety car has been borne out by experience. Observant operators know that independent of congestion within the car an increase in the maximum safety car load beyond about fifty passengers reduces the number of passengers carried per car-mile. The larger loads increase the number and duration of stops, thus decreasing the schedule speed and trips per car by an amount more than sufficient to offset the increased car loading. It should be remembered that even with the roomy platforms of large prepayment cars the time taken by each passenger to board or alight increases as the number of passengers boarding or alighting exceeds three or four per stop.

If one must carry more passengers per car than can be carried comfortably by the present safety car he may use a larger car, but the increase in car capacity which must be made to secure an increased loading per car-mile is so great that the service given by the larger car will be slow-speed, mass-transportation service instead of moderate-speed, safety-car service.

A SAFETY CAR FAN.

Safety Car Construction in Canada

Cars Embodying Many Changes from the Standard Birney Type of Construction Are Exhibited at the Car Works of the Ottawa Car Manufacturing Company, Ltd.

AT THE convention of the Canadian Electric Railway Association held in Ottawa, Ont., on Jan. 31 and Feb. 1, safety cars formed one of the principal topics of discussion and many of the attendants took advantage of the close proximity to the Ottawa Car Manufacturing Company's works to inspect some new safety cars which this company has under construction. Some of the changes for Canadian conditions which are embodied in these cars and others being considered were outlined by W. H. McIntyre, general manager, in a circular letter distributed at the convention. The following is an abstract of this letter:

Since the introduction of the Birney safety car there have been certain changes and improvements which our engineers have taken into consideration. These provide for increased safety to the public, reduced maintenance, improvement in appearance of the car, and changes to meet the climatic conditions of Canada. Our company is constructing a one-man car which we feel will be more suitable for Canada than the one now built in the United States. Improvements embodied include:

1. Increased strength of various structural parts.
2. Increased thickness of side sheathing.
3. Double floors with lining between.
4. Agasote headlining.
5. Agasote waist coating belt rail to floor.
6. Storm sash.
7. Wheels 26 in. in diameter.
8. Rubber cushion between underframe and truck.
9. Brake levers provided with safety jaws, not clevices as now used.
10. Additional heaters.
11. Seating arrangement changed.
12. Leather covered seats with the Ottawa flat spring, eliminating all coil springs.
13. Automatic spring bumper.
14. Safety panels for switches.
15. All air-brake piping installed inside the car where practicable.
16. New lighting arrangements.

Other features which are being considered for adoption on our Canadian safety car will increase capacity, provide greater comfort and convenience and additional safety. We have what we term a heavyweight one-man safety car which weighs 24,000 lb. This car is designed for use where existing headways are three minutes or less and where traffic is heavy. The design of this car includes a longer platform at the front, the use of double doors for entrance and exit of passengers, the employment of platform railing to separate incoming from outgoing passengers, the use of longitudinal seats at the ends, including all safety features with the National Pneumatic Company door engine. The equipment is so arranged that the motorman can operate the doors and steps singly if desired. This car has been constructed along the lines described in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 15, 1921, page 130, for a one-man car of somewhat larger proportions and seating capacity than that of the standard Birney car. This car was designed by the Ottawa Car Manufacturing Company a few years ago and there are now fifteen such cars in use.

We believe this is an opportune time for the railway managers of Canada to consider the standardization of street railway cars in Canada, which in the past has been overlooked.

Manager Prefers Single-Door Safety Car

Experiment Showed that Fares Are Lost in Rush Hours with Two-Door Type of Car—Also that Convenience of Passengers Renders Use of All Cross Seats Best

IN CONNECTION with an article in the Jan. 15, 1921, issue on "Trend of Safety Car Construction," in which a variety of changes made or suggested were discussed, the following experiences and conclusions of one safety car user are pertinent:

The first safety car run by this railway, which operates in a small city, but with some very dense intermittent traffic, was of the standard single-door type. Following some experience with this car the management thought it would be an improvement if the front platform was provided with both entrance and exit doors. Consequently a car of the double-door type was installed. It was not long before the company found that the theory of the double door was not working out in practice. Many fares were lost in the busy hours by reason of both doors being open, one for entrance and one for exit. Before the operator could close the exit door on the departure of the last passenger boarding passengers would force their way in through the exit aisle and seat themselves without paying fare. The operator, of course, would go back and try to get all missed fares. This meant the loss of three or four minutes of valuable time, annoyance to those who had already paid fare and several fares lost in any event.

The company next tried the plan of opening the entrance door only after the exit door had been closed. This proved to be an even greater waste of time than the first method. Finally, after timing the loading and unloading of passengers on both types of safety cars, the management learned that the single door was faster than the double doors, with the further advantage that the single-door car allowed no fares to slip by. The company now operates with the single-door system only.

Another interesting experience was in regard to the seating plan. One car had longitudinal seats in the corners to minimize congestion at the ends, while the other car had cross seats throughout. It was noted that passengers on the longitudinal-corner-seat car found it altogether too easy to crowd within the well formed by these seats. On the other hand, the very fact that it was not so convenient to stand near the bulkhead line of the cross-seat car led passengers to go back. The operator also had a greater inducement to remind passengers that they should move backward, for it did not take much of a standing load at the front end to crowd him uncomfortably. Hence the management concluded that the all-cross-seat car was the better in practice after all.

Moralizing a bit upon his experiences, the manager of this company says: "It seems to me that many companies are losing sight of the principle on which the safety car was designed, namely, that a large number of small cars on short headways should replace a small number of large cars on long headways. It seems to be the tendency to try to increase the size of the car and its carrying capacity, which will spoil the very principle for which the car was designed. The safety car is supposed to handle fifty persons as a full load. When the traffic is dense enough to exceed this load more cars are necessary. I believe that it has been proved that even on the congested lines in big cities two Birneys can replace one double-truck car and handle 30 per cent more people in less time. I think that if the various companies would bear in mind the principle on which the safety was designed there would not be so much inclination to enlarge the car and make other changes."

Heavy Short Circuit Kinks Third Rail

A RECENT derailment on the Northwestern Elevated Railroad, Chicago, resulted in a short circuit so violent that it threw the third rail out of alignment for a considerable distance from the point of derailment. Some work was being done on one of the express tracks and both express and local trains were being routed over the local track. In order to provide adequate feeder capacity for this track, therefore, four feeder sections had been tied together solid. When the train derailed the truck of the forward car grounded not only the third rail but the feeder cables, having a combined current setting in the substation of 30,000 amp. Following regular operating practice, the operator of the substation into which these cables lead tried three times to close the circuit breakers, each time throwing his machines off the line. Apparently the current rush through the third rail and feeders was so tremendous that the third rail was stretched out and kinked or buckled in varying amounts all along the line. In at least three places it was kinked and thrown over beyond the middle of the track, tearing loose or breaking the third rail insulators. The most remote of these points of maximum displacement was ¾ mile away. More than an hour after the accident, at this distant point, the third rail was still hot to the touch.

Association News

Prudence in National Affairs Urged

Reduction in Excess Profits Taxes and Income Surtaxes Necessary—Duty on Imports Should Be Made on Current Exchange Rates—Unnecessary Expenses Keep Cost of Living Up

ONE of the speakers at the midyear dinner of the American Electric Railway Association, held Feb. 10, 1921, in Chicago, was Hon. John W. Weeks, ex-Senator from Massachusetts. His address was not available prior to delivery and could not be included in the issue that contained a full account of the conference. Senator Weeks, while not speaking directly on railway matters, did touch upon several things that bore on the cost of railway operation, such as taxes and the cost of living.

REVISION OF TAX LAWS

On the necessity for a revision of the tax laws, he said that before the war about half of the government revenue, outside of post office receipts, came from the tariff and the other half from internal revenue receipts. Because these two sources were insufficient to carry on the war, the government imposed an excess profits tax, modified somewhat from European practices, but still with many irregularities that produced extravagance. When the armistice was signed it was apparent that prices would react. An excess profits tax cannot be collected, he said, when people are losing money, and for that reason as soon as the war was over this form of tax should either have been repealed or greatly modified.

As for the income tax, the surtaxes are too high, not because the person taxed has to pay too much, but because they have led to large investments in non-taxable government securities, with the result that many of the richest men in the country do not pay a single dollar in income surtaxes.

PROTECTIVE TARIFF ON IMPORTS

In 1914 and 1915, when it seemed that the country was on the verge of difficult times and business was bad, the import duty averaged less than 6 per cent. Twenty years ago it was 23 per cent. Today, with the depreciated rate of exchange, the average duty is 5.75 per cent. If the exchange rate was the same as when the law became effective, the amount of duty collected would be twice what it is. Senator Weeks suggested a provision to be made in the law permitting a change in the rate of duty when there was any material modification in the rate of exchange, and stated that the rate of duty on importation must be as reasonable as possible, not only to protect our own market but to enable the people on the other side to get on their feet. Based on the $4,000,000,000 estimate as the cost of governmental operation, import duties should pay, he said, $750,000,000, or 18.5 per cent. This would be a reality today if the duties now assessed were based on normal rates of exchange.

The inheritance tax, Senator Weeks stated, was not revenue in the ordinary sense of the word, but a symbol of property, and every dollar collected should be used to pay off the national debt and not current running expenses.

ECONOMY OF GOVERNMENT

The party that comes into power on March 4 is going to carry out its campaign pledge for economy of government, but people have no conception of how difficult it is to reduce expenditures, even though Congress is the most conservative part of our government. For the last twenty years, with but two exceptions, it has appropriated less money than asked for by bureau officers. Congress is now cutting the life out of a great many appropriations and should have real encouragement from the people at home when it tries to economize.

PRESENT CONDITION NATURAL

In conclusion Mr. Weeks stated that the condition that now exists in this country is perfectly natural. He agrees that we are inflated, that we may look healthy, but in reality are not healthy and will not be until we get back to normal conditions. However, he is optimistic enough to believe that we are tending toward those healthier conditions, but as it takes patience to bring about a state of normalcy such as should exist, every man should have courage. Let him look into his own affairs first and see if he is no worse off than at the beginning of the war. What is needed is courage and ordinary prudence in government and other affairs, and all will go well.

Heavy Traction Experts Confer

A MEETING of the Engineering Association committee on heavy traction met in New York City on Feb. 16, with Chairman Sidney Withington, New York, New Haven & Hartford Railroad, presiding. Present also were A. H. Armstrong, General Electric Company; L. S. Billau, Baltimore & Ohio Railroad (representing J. H. Davis); J. C. Davidson, Norfolk & Western Railway; C. H. Quereau, New York Central Railroad; J. R. Sloan, Pennsylvania System (representing the Association of Railway Electrical Engineers), and L. S. Wells, Long Island Railroad.

The committee first considered the definition of the term "heavy traction," and assumed that for the purposes of its investigations the term would cover roads operating trains of three cars or more or electric locomotives weighing 80 tons or more, or both. By committee assignment Mr. Armstrong and H. W. Cope, Westinghouse Electric & Manufacturing Company, are to compile a list of heavy traction roads for use in making a canvass for data and also to outline a questionnaire on electric locomotive practice that will bring out information supplementary to that contained in the reports of the 1920 and preceding conventions.

Mr. Withington, with other local members of the committee, will compile data on multiple-unit cars. The committee also considered the desirability of adding to its report a bibliography on heavy traction and a summary of what the heavy traction committees of other associations have been doing during the year. The desirability of getting together with electrification committees of other associations was also discussed and a sentiment in favor of a movement to this end was expressed. The meeting adjourned to reconvene probably early in May.

Claims Subjects Chosen

AT THE time of the midyear conference in Chicago last week a joint meeting was held by the Claims Association executive committee and its committee on subjects. Those in attendance at this meeting were: John J. Reynolds, claims attorney Boston Elevated Railway; W. F. Weh, superintendent of accident department Cleveland Railway; R. E. McDougall, general manager New York & Harlem Railroad; W. G. Fitzpatrick, general claim attorney Detroit United Railway; E. L. Lindemuth, claim agent Wilkes-Barre Railway; S. B. Hare, claim agent Altoona & Logan Valley Railway; J. S. Kubu, claim agent New York State Railways; Wallace Muir, claim agent Kentucky Traction & Terminal Company; W. H. Hyland, claim agent Fonda, Johnstown & Gloversville Railway.

The topic of greatest interest to both the industry and the public was considered to be safety. It was therefore decided to have one day of the October convention designated as "Safety Day," and on that day there should be a joint meeting with the T. & T. Association, the entire meeting being devoted to the subject of safety.

The second subject selected for consideration is "What Should Be the Method of Claim Departments in Handling Accidents and Claims." The purpose of this selection, as the title implies, is to bring forth what appears to be, or is believed to be, the most efficient mode of handling accidents and claims without regard to the size of the property or the location thereof.

The third subject chosen was "Constructive Arguments as Opposed to Destructive Contentions in Accident Investigation and Adjustment." This will be considered under the following subdivisions:

1. Refusal to give signed statement, by claimant or witness.
2. Refusal to permit medical examination.
3. Refusal of reasonable settlement without the advice of an attorney, or a threat to employ a "shyster" or a professional negligence attorney.
4. Refusal of claimant to disclose witnesses or attending doctor.
5. Request for company's witnesses.
6. Request by claimant for copy of description of occurrence.
7. Request that claim department repair damaged property.
8. Allegation that unfair advantage is taken of claimant.
9. Contention that any person injured in car accident is entitled to damages.
10. Request for adjuster to make frequent return calls.
11. Refusal to call at claim department offices for discussion.
12. That the company is liable or would not call upon claimant.
13. That settlement with driver for injury indicates liability for property damage.

This subject, it is hoped, will develop a psychological method of procedure in claims work.

The fourth subject will also be considered in a number of subdivisions. The topic is "Essential Points to Cover in Accident Investigation," and the subdivisions follow:

1. Boarding and alighting.
2. Collision with person.
3. Collision with vehicle.
4. Passenger assaulted; ejected; arrested; etc.
5. Passenger struck by passing car.
6. Passenger struck by standing vehicle or obstruction.
7. Vehicle wheel catching in switch or special track work.
8. Unreported accidents.
9. Falling in car.
10. Falling off car.
11. Riding on fender, bumper, etc.

12. Doors closed upon person or passenger.
13. (a) Car derailed.
    (b) Runaway car.
    (c) Car straddling switch.
    (d) Collision of cars.
    (e) Electrical disturbance in controller or motors.

The object of the fourth subject is, of course, the efficient training of the investigator with reference to the points that he should cover in making his investigation of a given accident. It is hoped so to treat this, educationally, as to have it furnish a practical code for guidance in such work.

As the fifth subject it was decided to have a "Free-for-All Discussion" on the following topics:

1. Value of publicity in claims work.
2. Best method of handling hospital cases.
3. Automobile hazard.
4. Using the mails to obtain witnesses' statements.
5. Claims by company for damage to its equipment and how such claims are handled.

It is proposed on this subject to have a series of oral discussions, limited to ten minutes, and this, it is believed, will afford ample scope for the exposition of mature views on the various sub-titles covered.

Employees Send Gavel to President

AN EMBLEM of authority was sent by his Charleston shop employees to President P. H. Gadsden of the American Association for use at the midyear conference at Chicago and thereafter. This gavel is their own handiwork. The following letter came with it to Chicago and explains the how and why of its construction:

CHARLESTON, S. C., Feb. 1, 1921.

P. H. GADSDEN,
President Charleston Consolidated Railway & Lighting Company,
Philadelphia, Pa.

DEAR SIR: Doubly "Our President," as the executive head of the Charleston Railway & Lighting Company and president of the American Electric Railway Association, we, your loyal employees and admirers who have known your worth for long, feel a just pride in the fact that the profession has seen fit to honor you by electing you as its head. We feel that the association in doing this has also honored itself by electing to this high position in the profession one who so richly deserves all the honors which they can bestow as a testimonial of their appreciation of your valuable services to the industry during the trying period of the great war, as well as your tireless efforts at all times to bring their true condition to the attention of the public.

In token of the high regard which we hold for you we therefore ask that you accept this "Emblem of Authority," which is the handiwork of your shop employees of the railway department. This is in no sense of the word a common gavel, as each piece of wood in its composition has, through long years of association, a meaning which we feel that you will appreciate. The dates which it bears, 1897-1921, as well as the twenty-four pieces of mahogany, cherry and maple which form its head, are emblematic of the years of service which these pieces of wood have done for you and the company as parts of the twenty-one old cars which were recently scrapped.

The mahogany parts and case are from the original interior finish of the Jackson and Sharp cars and the cherry strips are from the little Laclede single-truck cars with which the first electric railway service in Charleston was performed. The hickory strip in the handle is from a grab handle of one of the Brill single-truck cars and the maple is from the original flooring of the Jackson and Sharp cars.

We hope that this gavel may reach you in time to be used when you preside at the midwinter meeting of the American Electric Railway Association at Chicago on Feb. 10 and that you will honor us by using it. We also trust that it may be used at the great annual meeting of the association next October.

We therefore ask that you accept it as a token of esteem from

YOUR RAILWAY SHOP EMPLOYEES,
by F. H. HARRIS,
Superintendent of Equipment.

How to Keep the Hired Help on the Job

AS A PART of the publicity service now being carried on by the association it has reprinted in leaflet form the seven points laid down by Paul P. Haynes of the Indiana Public Service Commission in his recent address before the Indiana Public Utility Association, mention of which was made in the issue of this paper for Jan. 22, page 181.

These leaflets can be obtained in any quantity upon application to the secretary's office. A supply of 250 will be furnished gratis, but for quantities in excess thereof a nominal charge will be made.

Central Electric Accountants' Meeting

THE Central Electric Railway Accountants' Association met in annual convention at Dayton, Ohio, on Jan. 21 and 22. The principal subjects which came up for discussion were the cost of production of power and the distribution cost, the establishment of a freight astray bill, the adoption of a scheme for the minimum amount of collections on freight and passenger interline settlements and the use of the unit way bill as compared to the blanket way bill. A definite settlement of none of these questions was reached. The morning session on Jan. 22 was devoted to a round-table discussion of problems confronting individual properties.

Four new members were elected to the association, as follows: W. G. Bell, auditor Springfield (Ohio) Terminal Railway & Power Company; P.. A. Hommel, auditor Dayton (Ohio) & Western Traction Company; Miss E. H. Smith, auditor Cleveland, Alliance & Mahoning Valley Railroad, and J. W. Anthony, freight auditor Interstate Public Service Company.

At noon on Jan. 21, as mentioned in the issue of this paper for Feb. 5, the members present were taken to the plant of the Ohmer Fare Register Company, where luncheon was served to them, after which a trip through the plant was made. The Indiana-Ohio Bowling championship was then decided, the score being slightly in favor of Indiana. Dinner was served at the Elks' Club, following which the association went to a theater party as the guests of Mr. Ohmer.

The following officers were elected for the ensuing year. President, A. R. Baxter, auditor Indianapolis & Cincinnati Traction Company, Rushville, Ind.; first vice-president, Irwin Fullerton, general auditor Detroit United Lines, Detroit, Mich.; second vice-president. F. O. Reed, auditor Western Ohio Railway, Lima, Ohio. R. H. Ewan, auditor Toledo, Fostoria & Findlay Railway, Fostoria, Ohio, and H. F. McColgin, auditor Indianapolis & Louisville Traction Railway, Indianapolis, were elected to membership on the executive committee for a two-year period.

Paving Burden Attacked Abroad

IN ENGLAND, as in the United States, according to C. J. Jewell, electrical engineer Yorkshire (England) Electric Tramways, the question of the track paving burden is a live subject. As a means of relief, he suggests that it might be possible to apportion a part of the mechanically propelled vehicle tax to the maintenance of the railway strip paving. Because the tramcar is rail-borne, he believes, it is impossible for it to cause wear of the road surface, and it seems unfair that the expenses for paving maintenance between the tracks and 18 in. outside should be placed on the patrons of the tramway.

New England Railwayans Meet at Boston

St. Lawrence River Power Project and Equipment Maintenance Featured in New England Street Railway Club Meetings; House Chairman Worrall Also Addressed Meeting Informally

ONE of the most successful groups of meetings in the recent history of the New England Street Railway Club was held at the American House, Boston, Feb. 3, when Henry I. Harriman, president New England Power Company, discussed the St. Lawrence River power project; House Chairman George M. Worrall of the Massachusetts legislative committee on street railways spoke informally on experiences in traction legislation, and W. D. Wright, superintendent of equipment the Rhode Island Company, led a round-table discussion on equipment maintenance. I. A. May, president of the club, occupied the chair at the evening meeting, which followed the usual dinner, and before Mr. Harriman's address five new members were elected. The annual banquet of the club is scheduled for March 22, at the Hotel Copley-Plaza, Boston, and it is hoped to have a member of President-elect Harding's cabinet address the club at that time, and the names of other prominent speakers will be announced later. Dinner will be served at $6 per cover.

Mr. Harriman reviewed the St. Lawrence project comprehensively and emphasized the great benefit it would bring to New England railroads, public utilities and industries through electrification and the distribution of low-priced hydro-electric energy. He pointed out that the scheme would yield about 26,000,000,000 kilowatt-hours per year, assuming development on both sides of the river. The estimated cost is $300,000,000 and about ten years would probably be required to complete the development. A saving of about 30,000,000 tons of coal per year would be secured in this way, releasing the labor of about 100,000 men for other work. Only 2 mills per kilowatt-hour would be required to pay all interest charges and amortize the total cost of the project in thirty-five years. The savings resulting from the use of this latent hydro-electric energy would suffice to pay 4 per cent annually on the entire capitalization of all the railroads of New England. The commercial advantages of the project include the benefits to the transportation world from the construction of a navigable way permitting through water shipments between the New England coast and Great Lake ports.

Mr. Worrall spoke informally about his observations and experiences as a member of the Legislature who has sat for about eight years on the street railway committee.

EQUIPMENT MEN SHOW SUSTAINED INTEREST IN SAFETY CARS

Beginning with a discussion of safety measures as indicated in the recent ruling of the Massachusetts Department of Public Utilities, the equipment conference, participated in by about forty men during a two-hour afternoon session, interchanged experiences and emphasized continuing interest in safety-car practice, headlight work and devices for impelling energy saving on cars.

In discussing safety cars the point was made that it is desirable that a valve easily reached by passengers be located within the car so that, in case the motorman is overcome when resuming speed after a stop, the doors can be unlocked and the brakes applied by those within the car, the power also being shut off. Evidence was introduced to show that little or no safety-car equipment has ever been abandoned after going into service. The composition of this equipment, especially in relation to automatic features, embraces the use of well-tried devices long successful in air-brake work and having an extremely high percentage of reliability.

Several speakers emphasized the excellent record safety cars of the single-truck type have made in snowy weather, as compared with the larger double-truck cars, especially where the latter are provided with but two motors. The use of snow scrapers in northern climates was shown to be vitally essential to the best service from single-truck safety cars in heavy snows. Also, the use of both trolley wheels under sleety conditions has been found helpful in some cases in keeping the cars moving, the forward wheel acting as a sleet cutter for the rear wheel. It was brought out in the discussion that it would probably be feasible for the manufacturers of motors to design a motor of say 40-hp. rating for safety-car service, in case the weights of such cars are carried above 16,000 lb. Such a motor, it was said, might weigh about 500 lb. more than the present 25-hp. equipment. An intermediate size of motor might also be developed if a market for such a motor should materialize.

A short discussion occurred on the location of car rheostats, and the advantages of placing these within the cabs of large snowplows were touched upon. The possibility of locating rheostats of compact design on car roofs in passenger service was also brought forward. Recent improvements in rheostat insulator design have given operating men much satisfaction from the standpoint of trouble reduction.

USE OF DEVICES FOR IMPELLING ECONOMICAL USE OF ENERGY ON CARS IS FAVORED

Measuring apparatus, designed to record the energy consumption of car equipment, the amount of time spent in coasting, the time power is on the car, etc., were freely discussed. It was generally agreed that great improvement in the work of motormen followed the installation of such equipment, provided care was taken to secure the co-operation of employees by clearly explaining to them the objects sought in these installations. Several members testified their appreciation of the cordial co-operation given in the introduction of these devices by representatives of employees' unions and individuals, emphasis being laid upon the appeal to the personal interest of the employee in co-operating to save power and reduce brakeshoe wear and indirectly to better his own prospects through the institution of economies in the operation of the railway system of his company.

The meeting closed with a brief discussion of the possible use of oil in place of grease for gear-case lubrication, although the wisdom of the practice was questioned.

The American Engineering Standards Committee has approved revised specifications and tests for Portland cement, as agreed upon by the appropriate committee of the American Society for Testing Materials and the government departmental committee on cement. Copies of the specifications may be obtained from the standards committee, 29 West Thirty-ninth Street, New York City, or from the A. S. T. M. at a nominal price.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Albany Building New Force

United Traction Determined in Its Stand Against Men Who Rejected Wage Cut

Riot and blizzard have combined to defer the restoration of normal service on the strike-bound trolley lines of Albany, N. Y. Despite the efforts of the management of the United Traction Company, very few cars were operated on the lines during the first week of the strike. Aided by a number of strikebreakers the company has now succeeded in opening up most of the routes. Harry B. Weatherwax, vice-president and general manager, has announced that the railway will soon begin the recruiting of a new operating force to replace the strikers.

All attempts at settlement of the dispute between the railway and its employees have failed. The walkout was precipitated by the announcement that, beginning Jan. 28, wages would be reduced 25 per cent. This would bring the maximum wage down from 60 cents to 45 cents an hour, or to the scale in effect prior to July 1 last. This cut was made necessary by the refusal of the Public Service Commission for the Second District to grant the railway an increase in fare from 7 cents to 10 cents. The commission authorized an 8-cent fare in Albany, but refused an advance in Troy and directed a return to 5 cents in Rensselaer.

The men, who are members of the Amalgamated Association, demanded that the matter of reducing wages be submitted to arbitration. This proposition was flatly rejected by the management on the ground that payment of even the 45-cent scale would result in a considerable loss. The men thereupon walked out, tying up service in Albany, Troy, Rensselaer and other cities.

The Public Service Commission on Feb. 2 directed the company to resume operation not later than Tuesday, Feb. 8. In an attempt to comply with the order the company manned several cars with strikebreakers. The appearance of the cars provoked the wrath of the strikers and their sympathizers. Switches were blocked with dirt and snow. The cars were stoned. Numbers of guy wires were cut.

Governor Orders Police Service

When the first repair wagon left the carhouse it was followed by a large crowd of men and women, and was guarded by six mounted policemen.

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MOUNTED MEN OF TROOP K, N. Y. STATE POLICE, GUARDING LINEMEN REPAIRING WIRES ON UNITED TRACTION LINES

To reinforce the ranks of the city police Governor Nathan L. Miller ordered more than 100 state police to Albany. The state troopers soon succeeded in restoring order. Under the protection thus afforded the company set about to repair the damage to its equipment. For several days "dummy" cars were run on a few lines.

The situation was complicated on the night of Feb. 10 by a six-inch fall of snow. The force of strikebreakers was unable to cope with conditions. The work of clearing the tracks was a matter of days. Meanwhile all vehicular traffic was tied up. The jitneys which had been operating since the "electrics" stopped were snowbound.

Seattle Payroll Met

Private Bank Comes to Aid of Municipal Railway Employees Paid in Future Warrants

The problem of meeting the payroll of the trainmen on the Seattle Municipal Railway lines has been solved temporarily at least by the offer of the Marine National Bank, Seattle, to cash pay warrants of the employees for salaries. The offer, made in view of the "critical situation which would arise in event employees were not able to cash the pay warrants," as the bank explained, will avert the crisis which has developed since Feb. 1, when the city treasurer began setting aside all receipts of the railways to meet $404,000 due in interest on outstanding bonds, chiefly on the $15,000,000 in bonds paid by the city in the purchase of the Stone & Webster lines.

The bank, in making its offer, stated that while problems not contemplated when the city purchased the lines had developed recently it considered the matter as a civic duty, adding that the offer was made "with the hope that upon payment of the employees in cash full attention and time can be given to constructive measures and the ultimate solution of the perplexing problems of the railway system itself." The bank states that cashing of warrants will continue after Feb. 10 "until further notice."

City Treasurer E. L. Terry sets forth that the income of the railways is approximately $17,500 a day and will be available for warrants after Feb. 24, the first twenty-four days' receipts being required for interest charges. The treasurer estimates that eight pay days—four months—need to be met in the manner arranged, each semi-monthly payroll carrying about $135,000. Besides, each month there will be bills of about $150,000 for materials and supplies. The city treasurer states that the fund should be on a cash basis again about June 15.

The payroll crisis is only one of the problems of the railway. The city must now turn its attention to raising $713,000 for interest and principal on the railway bonds by June 15. While the city treasurer stated the system would be back on a cash basis by June 15, Mayor Caldwell states that he evidently did not contemplate setting aside $140,000 a month to meet the September interest charges and the principal retirement to begin March 1, 1921. This item of interest and principal, along with $83,000 owed by the railway to the general fund, would amount to $713,000 by the time the system is on a cash basis again.

New York Transit Bill Introduced

Governor Miller's Program Calls for Revamped System, Release of City's $250,000,000 Investment and Protection for Investor

Governor Miller of New York on Feb. 14 made public a summary of the rapid transit bills to be submitted to the Legislature containing his recommendations for securing statutory relief for the railways in New York City. One of the measures is an amendment to the Public Service Commission law and provides for two commissions. One is to be a Statewide commission with power over all utilities, excepting transit, in New York. The second commission will handle exclusively the metropolitan transit problem. The first commission will have five members; the city commission three, with five year terms.

THE State's police power to modify rates, either by way of increase or decrease, is provided "upon terms, conditions, safeguards or readjustments of franchise or contract rights or obligations."

Sufficient return from operation of the new unified transit system to exempt from the debt limit the city's investment in transit lines is the only specific provision made in the bill on the subject of rates. The whole question is one of adjustment. It is left with the commission to decide.

Home rule is guaranteed to the metropolis in a measure. If, however, the Board of Estimate of New York City is unable or unwilling to co-operate, or unable to decide its own policy, then the commission may conclude an agreement without the approval of the board.

The ideas behind the bills were, perhaps, set forth best by the Governor in a letter to Oliver B. Bridgman, New York, who said that he found quite a few people who had been hesitant about the Governor's program because they had no information with regard to the work the commission would be expected to undertake when it was appointed by the Governor should the Legislature comply with the Governor's recommendation. The plan as outlined to Mr. Bridgman follows:

1. The value of the physical property used in the public service, without reference to present capitalization, should be determined. The data for such valuation of many of the lines must already be in the possession of the present commission. It should not take long to make a valuation of the others.

2. Eliminate all outstanding inter-company leases.

3. Retire outstanding securities except such underlying liens as cannot readily be retired, for which provision looking to eventual payment must be made.

4. Vest in the city title to all lines not already owned by the city, free and clear of all incumbrances, except such underlying liens.

5. Make a lease to a new company, which shall provide for amortization of the determined valuation and for adequate reserves for depreciation, contingencies and the like.

6. Mortgage such lease to an amount approved by the commission, and issue stock and bonds not in excess of the valuations determined by the commission, in exchange for the securities retired.

7. To promote prompt reorganization and revamping of lines without assessing security holders, defer interest and dividends for one or two years, as might be determined by the commission, and at the end of such period prescribe a rate of fare sufficient to pay all charges provided for in the lease.

8. As an incentive to efficient management provision could be made for increased return on capital as fares are decreased, and a reduced return as they are increased.

9. Looking to the eventual transfer of general regulatory powers to the single Statewide Public Service Commission, provision could be made for a board of control, on which the city and the company should have proper representation. The alternative to that would be representation by the city on the Board of Directors of the company. The board of control plan is probably preferable, and that board might well have the powers of the present Transit Construction Commission.

10. As all approved charges will adequately be provided for under the plan, the provisions of the dual contracts for preferential payments could be eliminated and such other changes made as will fit these contracts into the plan, and as may appear to be in the public interest.

11. Provision for the imperative and immediate needs of the city for further transit facilities should be made promptly.

12. Determine what further relief, if any, can be given by legislation.

This outline was suggested merely for the purpose of discussion. The Governor said that a readjustment of the present deplorable situation in New York by any plan that may ultimately be decided upon should have these results:

1. To the public, a revamped and rehabilitated transit system that can and will give adequate service; assurance that the exploiting of the public for stock-jobbing and other purposes is really an evil of the past, and a new set-up that will insure efficient operation of the system at a fair return for service really and fully performed. This would mean an end of the present intolerable conditions which endanger the comfort, the health and even the life of the traveling public.

2. To the city, the ownership of the greatest transit system in the world; the freeing of its present frozen investment in the subways, so that approximately $250,000,000, including the amount for which the city is already obligated, will be released for new subways and extensions, schools and other badly needed municipal improvements, and adequate participation in, and control of, the new system.

3. To the investor, the full protection of the real values in the present transit systems, and the protection and stabilization of the new securities so as to render them an attractive field for investment.

The transit bill embodying the ideas of Governor Miller was introduced in the Senate on Feb. 16 by Senator John Knight, Wyoming, chairman of the public service committee of that body and in the Lower House by Simon Adler, majority leader. No extra copies of the legislation were available on its introduction. This provoked considerable discussion. It was decided that hearings on the bill in New York City would serve no useful purpose. A public hearing will, however, be held at Albany on March 2 before the public service committee of the Senate and judiciary committee of the Assembly.

Power Project a Five-Year Undertaking

Application for water-power development on the Colorado River in Mojave County, Ariz., which, producing 480,000 hp., will make possible the electrification of 500 miles of the Atchison, Topeka & Santa Fé Railway, and irrigation of approximately 500,000 acres of land, has been filed with the Federal Power Commission by E. L. Beyard of Seligman, Ariz. This project is backed by Kansas City and Philadelphia financiers in a corporation capitalized at $6,000,000. In this project it is proposed to construct eight dams, the first of which will be located about 25 miles due north of Needles, Cal., and the last of which will be built inside Grand Canyon National Park.

Dorchester Program Outlined

Alternative Plans Suggested Costing from $20,635,000 to $7,100,000 for their Completion

A comprehensive report, dealing with estimates of investment required and probable operating costs of various plans for increased rapid transit facilities in the Dorchester district of Boston, has been presented to the Massachusetts Legislature by a joint board consisting of the Massachusetts Department of Public Utilities and the Transit Department of Boston.

The several plans discussed are of particular interest in that they involve comparisons of costs by extension of an existing tunnel with costs of operating rapid transit trains on new tracks built on existing steam railroad rights-of-way, and also costs of high-speed surface cars on reserved spaces in public highways. The report also brings out the fact that the Washington Street and Park Street Station facilities of the Cambridge-Dorchester tunnel are already congested, and are not capable of meeting the demands which the proposed extensions of this rapid transit line would impose.

The report shows that to accomplish the generally desired result of relieving the Dorchester traffic situation, the following plans are under consideration, with estimated costs as shown:

Extension of Tunnel, Investment about	$20,635,000
Daily operating deficit	$ 4,649
Use of Midland Division, N. Y. N. H. & H. R.R., Investment about	$10,300,000
Daily operating deficit	$ 2,178
Use of Shawmut Branch, N. Y. N. H. & H. R.R., Investment about	$ 7,100,000
Daily operating deficit	$ 1,200
Complete circuit, using two sections, Investment about	$15,900,000
Daily operating deficit	$ 2,567
Complete circuit, using Shawmut Branch above and surface cars in reserved spaces in streets for balance of circuit. Investment about	$15,900,000
Daily operating deficit	$ 2,233

The investment estimates, and daily operating deficits were computed on present-day costs and traffic densities. The Joint Board gave as its opinion that the wisest course would be to consider the development of only some one part of any of these several plans for the present, and stated that even that would still be subject to acceptance by the trustees operating the Boston Elevated Railway. The latter are now said to be studying the report of the joint board, which meanwhile has recommended to the Legislature the necessity for authorizing a continuance of its study of this subject.

Budgets and Economy Urged

Governors Deal with Electric Railway Problems—Blue-Sky Legislation Also Recommended

Electric railway problems received special attention this year from the Governors of New York, Connecticut and Illinois in their messages to the Legislatures. As a matter of fact the Governor of New York has made the traction problem the subject of a special message. In Connecticut, as noted previously, the Governor addressed the Legislature at length on this matter and transmitted a special report by a committee appointed to consider the entire subject. In Illinois Governor Small urges the creation of a transportation district in furtherance of the recommendations contained in the report made to Mayor Thompson by his special commission.

The messages of the Governors elsewhere indicate a realization on the part of all of them of the need for economy. In fact, practically all the Chief Executives urge closer adherence to the budget system. Another subject to which many of the Governors called attention is the need for stringent laws governing the sale of securities to the public. Workmen's compensation being pretty generally in effect, recommendations on this matter were confined very largely to the strengthening and the modification of the laws already in existence. Other matters that receive attention are water power development and the conflict in authority between state and government over intrastate rates.

Gov. Henry J. Allen, Kansas, said that the Court of Industrial Relations was meant to be a court of human relations, not a court of public utilities. Because of the desire to save the cost of an additional body the Industrial Court was authorized to administer the old public utilities law. He said, however, that if the court was to work out the big, real purpose of its existence, it would need to be relieved of the burden of public utility regulation. He has since sent a special message to the Legislature on this subject.

URGES ABOLITION OF UTILITIES COMMISSION

Gov. Leslie Small, Illinois, urges the General Assembly to repeal the state public utilities law and thereby abolish the State Public Utilities Commission. He further urges the passage of a law giving to all cities in Illinois the right of home rule in the regulation and control of their public utilities. He feels, however, that there should be some state body or agency exercising governmental authority over such properties with powers and jurisdiction similar to the Railroad & Warehouse Commission, which was supplanted by the present Public Utilities Commission. He wants the General Assembly to give this subject immediate attention. He also urges the Assembly to enact legislation to permit the citizens of Chicago and vicinity, if they so elect, to establish an independent transportation district and "to provide for people's ownership and operation of local transportation systems" under the plan advocated in the recent report on transportation to Mayor Thompson of Chicago.

Twenty-six Persons Injured on Long Island Railroad

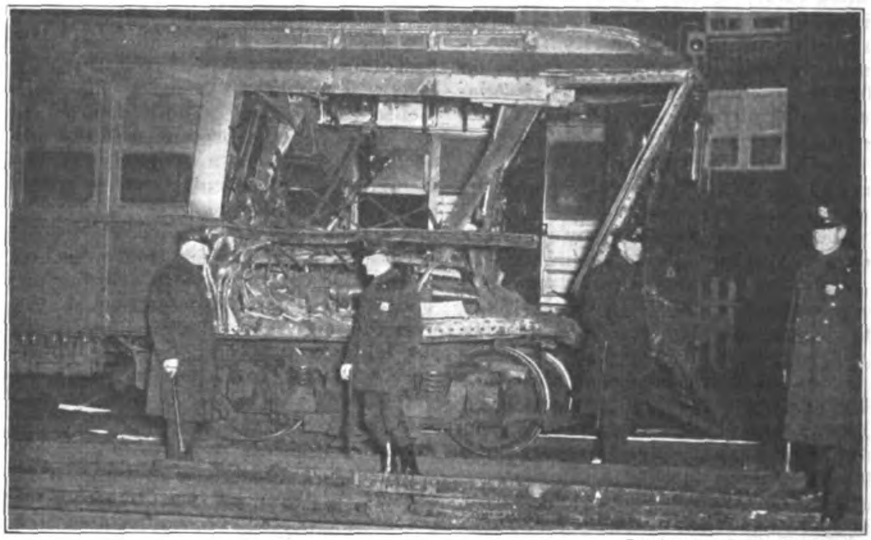
Twenty-six persons were injured in an accident on the Long Island Railroad at 9:40 p.m. on Feb. 13 at Crescent Street, Brooklyn, on the Atlantic Avenue division. It is at this point that the four-track line from Jamaica is reduced to two tracks which continue into the Brooklyn terminal. Up to the afternoon of Feb. 14 the investigation of the accident by the company had not yet been completed.

The testimony of witnesses of the accident, however, indicates that the accident was caused by Motorman Edward Costello, in charge of local Train No. 3653, running past a signal and through the main track switch, which was set against him.

Motorman Thomas Moore, of Train No. 2755—a westbound express from Hempstead—was running on the middle or express track, and had a clear block. He applied the emergency brakes as soon as he realized that the local was occupying the main track, but was too late to stop his train. The express "side-wiped" the local train, partly turning over the first two cars of the local, and derailing one of the cars of the express. The tracks and interlocking device at the Chestnut Street tower were badly damaged.

Motorman Costello, who was arrested, charged with responsibility for the accident, was an experienced man. He entered the service of the Long Island Railroad on May 25, 1906, as a fireman, and was promoted to engineman on May 6, 1912.

Normal train operation in and out of Brooklyn was resumed at about 10 a.m. on Feb. 14.



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DAMAGE SHOWN AS DONE BY EXPRESS RAMMING LOCAL

Counter Plan by City

Municipality Would Seek Authority to Purchase Certain "Day-to-Day" Lines of Detroit United

An ordinance proposed by the Board of Street Railway Commissioners for presentation at the April election provides for the purchase of approximately 25 miles of lines operated by the Detroit United Railway under the so called day-to-day agreements. The measure has been read twice by title in the Council, ordered printed and laid on the table for future action.

The proposal of the Detroit United Railway, which will also be on the April ballot, is the initiative ordinance providing for unified operation of all lines by the Detroit Service-at-Cost Railway under regulation by the city. The Detroit United Railway would receive 6 per cent on the value of its property.

The Street Railway Commission sets forth in a resolution that it has caused to be constructed approximately 18 miles of single track of the Municipal Street Railway system authorized by the electors of the city of Detroit on April 5, 1920, and is now operating cars on part of these lines and desires to add to the operating unit certain other trackage and property authorized to be acquired under the proposition of April 5, upon which certain streets the Detroit United Railway has constructed lines under the terms of day-to-day resolutions passed by the Common Council.

The Commission is advised by the Corporation Counsel that the contracts of purchase need to be approved by the electors of the city before all or any part of the street railway property in question can be purchased.

The question to appear on the ballots is: Shall the city of Detroit and the Board of Street Railway Commissioners be authorized and empowered to purchase at cost thereof less depreciation, all or any part of the street railway property of the Detroit United Railway construction upon the streets, alleys and public places of the city of Detroit, under the terms and conditions set forth in certain day-to-day resolutions or contracts between the city of Detroit and said company.

Payment for these lines is to be made out of the proceeds of the public utility bonds authorized to be issued at the April 5 election. Under the existing agreements in case the city and the Detroit United Railway fail to agree on the price to be paid for the lines, a board of arbitrators will be selected consisting of three members to determine the price to be paid.

Injunction Again Invoked at Detroit

Another restraining order was secured by the Detroit (Mich.) United Railway against the city of Detroit when Judge Denison of the United States Court of Appeals at Cincinnati granted the company's petition for an injunction to prevent the city from interfering with the company's tracks on Harper Avenue between Gratiot Avenue and Montclair. A hearing has been ordered for Feb. 19. Judge Denison was appealed to in the absence of Federal Judge Tuttle from Detroit and the State.

The action is the company's answer to the City Council's action in passing a resolution instructing the street railway commission to notify the company to remove its tracks from Harper Avenue.

In the recent resolution of the Council it is claimed that the Detroit United Railway has partly constructed a concrete base with ties and tracks along Harper Avenue and along the route in question but has never completed it for the operation of cars. The present condition of this construction is held by the commission to be a menace to the public in addition to preventing the city from extending its tracks along Harper to Gratiot Avenue.

The city claims that under the terms of the resolution of May 27, 1919, it was expressly provided that in event of the revocation of the resolution, the company would forthwith remove from the streets, the property to be permitted to be placed therein.

The Council, in the resolution just passed which resulted in the issuing of the restraining order, directed the Commissioner of Public Works or the Street Railway Commission or such other municipal authority as might be necessary to remove the property, in default of the company complying with the city's demand.

Under the terms of the day-to-day agreement now in force between the company and the city, the city claims the right to buy from the Detroit United Railway at any time at the cost of the lines less depreciation. The company maintains that the city's action constitutes an impairment of contract and disputes the city's right to purchase in this case.

Indiana Commission Attacked

Lively Hearing Before General Assembly on Bill to Abolish Commission —Many Commission Defenders

The bill before the General Assembly of Indiana to repeal the law creating the Public Utilities Commission has been reported out of committee and now is on its third reading. In Indiana the law provides that bills shall not be printed until they have been reported out of the committee and passed by a second reading. The forces favoring the bill used the argument that the legislature members who were fighting the bill should at least wait until it had been printed and distributed in order that it might be more thoroughly digested by the individual members who before had no direct connection with the progress of the bill.

REPORT ON COMMISSION'S SERVICES NEEDED

The minority members of the Assembly are hailing with delight the first real division that has stirred the very heavy Republican plurality in both House and Senate. Those opposed to the repeal of the present utilities law declare they have a majority in the House of about seventeen votes, all of which will be cast against the present bill.

A hearing held in the House on Jan. 27 crowded the chamber to overflowing. Those favoring the retention of the present law were overwhelmingly in the majority. Members of the Public Service Commission were present at the hearing, but none of them vouchsafed any information except when incorrect statements were made concerning the work of the commission. B. R. Inman, manager of the Chamber of Commerce of Indiana, called attention to the fact that the alleged expenses of the commission were being used by those opposed to the commission as propaganda to prevent the people from knowing the facts. He said that a statement of facts relative to the service rendered by the commission was more to be desired in connection with the hearing than any opinion that he might express as to the merits or demerits of the proposed bill.

Claude A. Smith, one of the authors of the bill, attacked the commission in a short talk. He pointed to several utility companies which had gone through the duration of the war without a rise in rates.

LARGE ATTENDANCE PRESENT

Among those who spoke before the committee advocating the retention of the commission were Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company; Mayor Charles Jewett, of Indianapolis; Henry A. Barnhart, president of the Indiana Telephone Association; Dick Miller, president of the City Trust Company; E. Vernon Knight, president of the New Albany Veneering Company; Joseph Kebler, vice-president of the Indianapolis Board of Trade, and Joseph E. Bell, former Mayor of Indianapolis. Many men prominent in the gas industry were present, but they did not take the floor.

Wisconsin Railroad Commission Attacked

For the first time since the Wisconsin Railroad Commission was created, its members have been summoned before the State Legislature to explain a decision. The immediate cause of this action was the granting by the commission of a 20 per cent increase in gas rates to the Milwaukee Gas Light Company.

Under the Wisconsin law the Legislature may interpellate the commission, provided a sufficient number of the members sign the petition and not more than a certain proportion of them are members of one political party. The commission has been asked to produce all records in the case and to explain the basis of its orders and the extent of the investigation made into the financial status of the company.

A petition has also been filed with the Legislature by the Federated Trades Council of Milwaukee asking for the abolition of the commission. A bill to that effect has actually been introduced in the Assembly. It seeks the repeal of all the commission laws and provides for the regulation of public utilities by local authorities.

The commission will be interpolated on Feb. 24. Meanwhile it has ordered a public hearing in Milwaukee on Feb. 18 on the question of reopening its decision in the gas rate case.

Anti-Traction Bills Introduced in Illinois

The bill which would create a transportation district and pave the way for people's ownership and 5-cent fares in Chicago was introduced in the upper house of the Illinois General Assembly on Feb. 8. The following day bills were introduced to repeal the public utilities act and to grant home rule in the regulation and control of public utilities.

The indications are that these bills will be vigorously pushed with the idea of having them passed by the Legislature in time to place them before the people for referendum at the April 5 election. Unless affirmative action is secured by Feb. 23, however, the matter cannot be included in the April election.

The bill which would create a transportation district is identical with that formulated by Mayor Thompson's traction commission and approved by the Chicago City Council.

A counter municipal ownership proposition was also introduced in the Lower House by Representative Church, and by Senator Evans in the Upper House. This bill would provide for municipal ownership by raising the municipal tax limitations from 5 per cent to 15 per cent where the excess is to be used exclusively for the purchase of utility properties.

Still the Road Was Permitted to Die!

Residents of Providence and Danielson, R. I., mourn the loss of the Providence & Danielson Railway, authorized recently to be scrapped. The thing these people feared has come upon them. Despite all that the road did for them, these people have suffered the line to decay and die. The funeral oration as delivered by the Danielson *Transcript* showed ingratitude, the marble-hearted fiend, at its worst. That paper said:

> The road is dead. Its life has been a beneficent one. It served a previously isolated country. It turned a worthless wilderness into greenbacks. It doubled and trebled real estate values. It brought the farmer nearer to the city markets, and gave the merchant a quick freight. It gave an impetus to village growth and improvement. The city and country folks came and went and knew each other better. There was greater homogeneity.
>
> Educational privileges were enchanced and multiplied. The city newspaper came out daily where before it was unknown. Scores of bright Rhode Island boys and girls came up to our Killingly High School, or further down the line attended the city schools.
>
> Churches were benefited. Religious gatherings and conventions were better attended. There was a more frequent interchange and intermingling of the pastors and congregations of different churches. Country churches were often served by city pastors. Thus was fraternal feeling and better acquaintance made possible.
>
> Healthful and pleasant recreation and enjoyment were promoted. Picnics, Old Home Days, fairs, etc., multiplied along the line, and an ever helpful and courteous management catered to the pleasure of its patrons.
>
> The road was always popular with summer tourists, who were seeking a day's outing and were delighted by the transition from the lowlands, the smoke and the smells of the city to the fresh breezes of the western highlands. During its brief life of less than twenty years it transported more than 20,000,000 people.
>
> With unfeigned sorrow and many regrets we see our old friend handed over to the merciless undertaker of the junk heap. The hand of local progress has moved backward along the dial even beyond the time of the stage coach days of genial John Richards and William Stone. Providence is again a distant city.

Service-at-Cost Legislation for Milwaukee

The Common Council of Milwaukee, Wis., in special session on Feb. 1, 1921, adopted a resolution authorizing the City Attorney to co-operate with the committee on acquisition of public utilities in formulating legislation, which if passed would enable the city to negotiate with the Milwaukee Electric Railway & Light Company for the operation of Milwaukee's railway system on a "service-at-cost" basis.

The resolution was previously unanimously endorsed by the Council's joint committee on finance and legislation. The action was asked of the Council by the committee on acquisition of public utilities, an official body, which for about a year has been investigating the question of municipal ownership of public utilities in Milwaukee, particularly of the electric railway system.

F. S. Hunt, chairman of the committee, is reported to have said recently:

> If the valuation of the property can be decided on, the committee, I believe I can say, would report in favor of a "cost of service" plan for the operation of the railway lines. This would be similar to the plan now in effect in Cleveland with one addition.

Removal of New Jersey Commissioners Sustained

The Court of Errors and Appeals of New Jersey on Feb. 15 by a vote of seven to six sustained the action of Governor Edwards in removing from office the four members of the Public Utilities Commission for alleged misconduct and neglect of duty. This confirms the decision of the Supreme Court, which also upheld the "ouster" in quo warranto proceedings brought by the Attorney General to test the right of the ousted members of the board to continue in office.

The decision of Feb. 15 removes all question as to the legal status of the commissioners removed from office by the Governor last September. The Board, however, continued to function until the Supreme Court decision affirming the "ouster" was rendered on Dec. 27.

Chief Justice Gummere in his opinion on Feb. 15 said the court was justified in assuming that the Governor had found all the members guilty of some of the charges of neglect or misconduct and that that afforded justification for his action.

Immediately upon receipt of word that the Court of Errors and Appeals had upheld Governor Edwards in ousting the commissioners serving under the old law the Republican leaders rushed through the Legislature the Walworth bill for a new Public Utilities Commission.

News Notes

Decision Against One-Man Cars.—The City Commission of Port Huron, Mich., has refused permission to the City Electric Railway to operate the one-man type of car in the city of Port Huron.

Brooklyn Shops on Short Shift.—Lindley M. Garrison, receiver for the Brooklyn (N. Y.) Rapid Transit Company, announced on Feb. 11 that the general repair shops of the company will be shut down one week this month and one week next month and that the inspection shops will be operated five days a week instead of six, as heretofore. The reason, the receiver said, is that work, which had piled up in the shops since the strike, has become normal again, and this means is taken to avoid the alternative of laying off a considerable number of employees. The order will affect about 1,500 persons. Since the first of the year, Mr. Garrison added, 300 employees have been laid off, largely in the surface repair shops, because of decrease in the amount of work, due to the discontinuance of a number of the surface lines.

Programs of Meetings

American Association of Engineers

A national engineering conference on public information will be held in the Congress Hotel, Chicago, on Feb. 25 under the auspices of the American Association of Engineers. Among those who will address the sessions are Richard H. Waldo, general manager of the Inter-Racial Council, and State Chief Engineer Mack of Wisconsin. F. W. Feiker, vice-president of the McGraw-Hill Publishing Company, and Ivy L. Lee, director of publicity for the Interborough Rapid Transit Company, will present papers. R. W. Crumm of the Iowa Engineering Society will tell of the publicity work which his society has done in Iowa. The purpose of the conference is to discuss the question of engineering publicity from every possible angle and reach decisions upon the effectiveness of various publicity methods. Among the round table discussions will be such subjects as "Technical News Service," "A National Clipping Service," "How Publicity Helps a Community" and "Engineering Publicity from Standpoint of the Public."

Wisconsin Electrical Association

The thirteenth annual convention of the Wisconsin Electrical Association will be held at the Hotel Pfister, Milwaukee, Wis., March 23 and 24. A joint session with the Wisconsin Gas Association will be held on the afternoon of March 23, at which time an address on safety will be given by Charles B. Scott, manager the Safety Bureau, Chicago, an address on "Public Utility Associations," by R. V. Prather, secretary, Illinois Electric Railway Association and of the Great Lakes Geographical Division N. E. L. A., and a third address on the work of the Wisconsin Public Utilities Bureau by Frantz Herwig, director.

On March 24 the following papers will be heard:

"Induction Regulators," by Frank Hershey, General Electric Company; "Electrical Merchandising," by C. E. Michel, sales manager, Union Electric Light & Power Company, St. Louis, Mo.; and a "Symposium on One-Man Car Operation," by B. W. Arnold, Eastern Wisconsin Electric Company; H. A. Mullett, the Milwaukee Electric Railway & Light Company; R. M. Howard, Wisconsin Railway, Light & Power Company; Dudley Montgomery, Madison Railways Company, and C. R. Phenicie, Wisconsin Public Service Company.

Other papers will deal with the subjects of "Street Railway Rate Schedules," by W. H. Sawyer, president East St. Louis & Suburban Railway; "Power Factor—Methods of Correction, Measurement and Application to Rates," by F. A. Coffin, sales manager the Milwaukee Electric Railway & Light Company; and "Customer's Demand as a Factor in Rate-Making," by L. B. Andrus, American Public Utilities Company.

Financial and Corporate

$1,073,020 Deficit in Seattle

Preliminary Accounting for Municipal Railway Shows Serious Situation —Revenues Now Increasing

According to a summary issued by City Comptroller H. W. Carroll the Seattle (Wash.) Municipal Railway shows a deficit of $1,073,020 for the year 1920, $677,178 of this sum being charges for depreciation. The statement showing passengers carried notes a decline in traffic beginning in February, 1920, and continuing throughout the year.

While cash fares slumped when the first fare increase was adopted there was a marked increase in the number of "deadhead" rides, the year's total showing an increase of 363,297 rides by policemen, firemen, mail carriers and railway employees, or about one-third more than in 1919. The railway is reimbursed for all this riding, except that done by railway employees.

At the same time there was a decrease of 9,114,648 in the number of cash rides during the year, as compared with 1919. While $61,777 is charged to loss on property retired from service a footnote explains that other losses from property retirements, amounting to approximately $165,000, are being accounted for, but that exact figures are not yet available.

The total revenue for the year was $5,463,393, of which $5,410,764 was from fares. The total expenditures were $6,536,413, including $865,660 in interest on bonds and warrants.

At the end of December, 1920, the cash deficit of the railway system was $95,318, and there were warrants outstanding of $19,205. This showing is against a cash balance on hand of $208,064 on Jan. 1, 1920. The comptroller's office, in issuing the figures for the year, estimated that the system would be back on a cash basis by May 1.

It is announced that since Jan. 9, when the 8½-cent fare went into effect, the revenues have mounted to an average of $18,550 a day. This includes tokens purchased but not used, the actual fares received and earned being about $17,500 a day. The increase in revenue is said to be about $2,800 a day.

Increase of $228,310 in Texas Electric Net Earnings

Stockholders of the Texas Electric Railway held their annual meeting at Dallas, Texas, recently. The officers were re-elected.

In his report J. F. Strickland, president of the company, gave the gross earnings from operation for the year as $3,454,615, an increase of $503,104, or 17 per cent over the previous year. Operating expenses and taxes totaled $2,013,072, an increase over 1919 of $274,794, or 15.8 per cent. Net earnings from operation were $1,441,543, an increase of $228,310, or 18.8 per cent over those of the previous year.

The report cited that regular dividends have been paid at the rate of 7 per cent on the first and second preferred stocks and other regular dividends on the common stock. The sum of $210,000 has been set aside from the surplus into the renewal and replacement reserve, to be used for purposes of maintenance and upbuilding the company's property, it was stated. The surplus of the company has increased $356,914 during the year.

The report pointed out that the company is "being called upon constantly to make additional investments in the various communities which we serve," on account of paving work programs along the various lines. In this connection it says:

> We would again point out that if these local railway systems are to be a successful, growing part of the rapidly growing communities which are served by them, some sort of relief such as increased fares, reduction of taxes or abolition of paving charges, or possibly all of these, must be worked out.

United Railways, St. Louis, Appraised at $48,936,805

The Missouri Public Service Commission has placed a value as of Jan. 1, 1919, of $48,220,316 on the properties of the United Railways, St. Louis, including the Florissant Construction, Real Estate and Investment Company and the St. Louis County Street Railway and $716,497 on the Missouri Electric Railroad. This total value of $48,936,805 covers both carrier and non-carrier property. Conforming to the practice of the Missouri Commission the items of promotion and going value have been omitted, not that they have no place in a valuation but for the reason that it is the practice of the commission to make due allowance for these items at the time of fixing the fair present value of the property.

The par value of securities outstanding on Dec. 31, 1920, including $4,200,000 of receivers certificates, amounted to $95,581,000. The total market value of these securities at that time was $30,136,221.

Bankers Study New Orleans Problem

A number of bankers of New York and Philadelphia conferred on Feb. 14 with Receiver O'Keefe, of the New Orleans Railway & Light Company, at New Orleans relative to straightening out the affairs of the railway. Among those who took part in the conference were M. M. Buckner, president of the New York Trust Company; G. M. Dahl, vice-president of the Chase National Bank, New York; Joseph Wayne, president of the Girard National Bank, Philadelphia; George M. Reilly, Reilly, Brock & Company, Philadelphia; Clarence Harper, Harper, Turner & Company, Philadelphia; J. A. Caldwell, Philadelphia.

A survey of the company's lines was planned by the bankers for Feb. 15 with the view of determining what is needed to put the lines in good working condition. It was expected that following the inspection a formal statement would be given out to the press.

New Charter Proposed

British Columbia Electric Railway Seeks to Place Company Under Railway Commission of Canada

The British Columbia Electric Railway, Vancouver, B. C., has applied for a Federal charter under the name of Vancouver, Fraser Valley & Southern Railway, the name of one of its existing interurban lines. The intention is to have the Vancouver, Fraser Valley & Southern Railway, under its new charter, take over the whole of the company's properties consisting of city and interurban lines in Vancouver, North Vancouver, New Westminster and Victoria, and its light and power systems with the exception of its power plants. The company's gas properties would not be included under the new charter. It is proposed also to change the name of the Vancouver, Fraser Valley & Southern Railway back to the British Columbia Electric Railway or a similar name.

The object of this move is to place the company under the jurisdiction of the Board of Railway Commissioners of Canada, a Federal body, and by that means obtain the stability as regards fares and rates which will enable the company to raise new capital. At the present time the company is temporarily under that commission, having been taken under Federal control in 1919 by an Act of Parliament not intended to operate on electric railways.

The Parliament of Canada, at its last session passed an amending Act returning the British Columbia Electric Railway to provincial jurisdiction about July 1, 1921. Owing to the abolition of the Provincial Public Utilities Commission, this would thrust the company back on its original franchises which call for a 5-cent fare although a 6-cent city fare and a 7-cent suburban fare are the rates now charged.

The alternatives before the company are the negotiating of new franchise rates with half a dozen cities and municipalities, or obtaining authority from a separate commission. The latter course has taken the form of an application for Dominion Charter in the absence of a Provincial Commission. The company is pointing out that new capital will be urgently required during the next year or two and that it will be impossible to obtain it if its fares are not on a stable basis.

Holding Company and Leases Scrapped

Rhode Island Properties Simplify Financial Structure and Secure State Aid—Jitneys Eliminated

Direct ownership by a new company of the electric railway properties at Providence, R. I., is provided in place of the former involved system of holding companies and leases under the plan for the reorganization of the railways there as approved by the joint reorganization committee. This committee consists of Michael F. Dooley, Stephen O. Metcalf and Samuel P. Colt. The existing securities to be readjusted by the plan consist of $13,998,000 of bonds and $8,000,000 of stock. The new securities provided by the plan will consist of $12,598,200 of bonds and $7,999,800 of stock, making a reduction in the capitalization of $1,400,000.

A FEATURE of the plan is that the board of directors of the United Electric Railways, the successor company, shall consist of nine members, five elected by the stockholders, one appointed by the trustee under the general and refunding mortgage, two appointed by the Governor by and with the advice and consent of the Senate and one appointed by the Mayor of Providence.

TABLE SHOWING ALLOCATION OF BONDS AND STOCK OF NEW COMPANY AT PROVIDENCE

New Company Bonds and Stock		For $4,708,000 Rhode Island Suburban Railway First Mortgage 4% Bonds	For $247,000 Pawtuxet Valley Electric Street Railway First Mortgage 5% Bonds	For $43,000 Cumberland Street Railway First Mortgage 6% Bonds	For $9,000,000 United Traction & Electric Company First Mortgage 5% Bonds	For $8,000,000 United Traction & Electric Company Capital Stock	For Cash	Totals
Prior Lien Mortgage	Series A 7%	....	....	....	....	....	$1,000,000	$1,000,000
Twenty-five Year Gold Bonds	Series B 4%	$1,883,200	$98,800	$17,200	....	....	....	1,999,200
General and Refunding	Series A 5%	....	....	....	$8,100,000	....	....	*8,100,000
Mortgage Thirty Year Gold Bonds	Series B 4%	2,354,000	123,500	21,500	....	....	....	2,499,000
Capital stock		470,800	24,700	4,300	900,000	$6,600,000	....	†7,999,800
Totals		$4,708,000	$247,000	$43,000	$9,000,000	$6,600,000	$1,000,000	

* An additional amount not to exceed $500,000 general and refunding bonds Series A are reserved for issue to provide for the acquisition of such of the Rhode Island Company Properties as the joint reorganization committee may determine to acquire.

† Additional capital stock may be issued in the discretion of the joint reorganization committee for the purposes of the plan to the amount permitted by the Rhode Island Public Utilities Commission.

The charter of the new company limits to $22,000,000 the par value of the stocks, bonds or other evidences of indebtedness which may be issued in payment for the lines and properties which it is proposed to take over. A comparison of present capitalization of the United Traction System and the proposed new capitalization follows:

(a) Amount of existing Securities to be readjusted by the plan:		
Bonds..........	$13,998,000	
Stocks..........	8,000,000	$21,998,000
(b) New securities provided by the plan in lieu of existing securities:		
Bonds:		
Prior lien Series B 4s............	$1,999,200	
General refunding mortgage Series A 5s............	8,100,000	
General refunding mortgage Series B 4s............	2,499,000	
Total.........	$12,598,200	
Stock............	7,000,800	20,598,000
(c) Reduction....................		$1 400,000

In addition to these securities there will also be an issue of $1,000,000 of prior lien, Series A, 7 per cent bonds, which will be sold for cash.

The plan and agreement of reorganization contemplate the acquisition and operation of the railway lines and properties included in the reorganized system by the United Electric Railways. The charter of this company was granted by the Rhode Island General Assembly at its 1919 session and amended at the 1920 session. Under it the United Electric Railways is authorized to acquire the lines and property of the Union Railroad, Providence Cable Tramway, Pawtucket Street Railway and Rhode Island Suburban Railway (formerly leased to the Rhode Island Company and controlled by the United Traction & Electric Company), the lines and property owned by the Rhode Island Company, and the lines and properties formerly leased to the Rhode Island Company by the Sea View Railroad and the Providence & Danielson Railway. The consent of the Attorney-General of the State of Rhode Island is required if less than the whole of the foregoing properties are acquired.

As stated previously, the charter limits to $22,000,000 the par value of the stocks, bonds or other evidences of indebtedness of the new company which may be issued in payment for the lines and properties mentioned, and limits to 6 per cent the dividends which may be paid upon the capital stock of the new company, except that a deficiency in any year may be made good in a subsequent year or years.

The General Assembly at its 1920 session passed acts exempting the new company from all taxes except taxes imposed by cities or towns upon its land, buildings or other tangible property, freeing it from certain paving and street improvement obligations imposed upon electric railways by the Rhode Island laws, and making all town and city ordinances affecting it subject to review by the Public Utilities Commission.

The city of Providence has also recently passed an ordinance regulating jitneys and motor-buses. This it is believed will prevent in large measure the unfair competition to which the railways have heretofore been subject.

The allocation of bonds and stocks of the new company is shown in the accompanying table.

In the opinion of the several committees representing the security holders, the plan presents the following advantages:

1. It provides at least $1,000,000 cash for rehabilitation, of which there is present need.
2. It reduces the fixed charges upon the United Traction System to $654,928. The amount which the Rhode Island Company was required by its leases to pay upon the same properties as fixed charges was $1,050,000.
3. It reduces the aggregate capitalization to an amount which, although much less than the estimated cost of reproduction of the property, should be representative of just expectations of income return under ordinary future conditions.
4. It obtains the benefit of the yearly exemption from taxation and limitation of paving and other obligations which will result, it is estimated, in an annual saving of more than $500,000.
5. It substitutes the direct ownership by the new company of the entire properties for the former involved system of holding companies and leases—a result which will undoubtedly be beneficial from the point of view of organization and will remove a source of public misunderstanding.
6. It secures the control of the Public Utilities Commission over the issue of securities by the new company, the limitation in the charter upon the capitalization and dividends of the new company, and the representation of the State and the city of Providence upon its board of directors;—all of which will, it is believed, be conducive to the interests of the security holders as well as of the public.

City Joins Rental Appeal Case

The City of Philadelphia, Pa., and the Public Service Commission have filed petitions in the State Supreme Court asking for an allowance of an appeal to that tribunal from a decision of the Superior Court which relieved the underlying companies of the Philadelphia Rapid Transit Company from the necessity of obeying a commission order directing them to answer complaints about rentals paid.

The decision of the Superior Court was referred to in the ELECTRIC RAILWAY JOURNAL for Dec. 25, page 1303.

Following the decision of the Superior Court the United Business Men's Association filed a petition for an appeal in the Supreme Court. In this proceeding the city and the Public Service Commission have now joined. The Supreme Court will hear the case in Philadelphia on April 18.

Brooklyn Receiver Asks Instructions

Petition of 120 Pages to Court Contains Statement of Earnings and Summary of Debt

Facts about the conduct of the Brooklyn (N. Y.) Rapid Transit Company under the administration of Lindley M. Garrison as receiver are contained in a 120-page petition by Mr. Garrison to the court, making a report as to the affairs of the company and seeking instructions of the court. In general the petition says that it seems too clear to require elaborate statement that the transportation problem in Brooklyn should be treated as a whole and that it is impossible satisfactorily to deal with it piecemeal.

THE petition points out that while under existing conditions there is no centralized authority capable of dealing with the situation as an entirety, and while it is not suggested that the court, under existing conditions, can deal as adequately with the question presented to it as it could if there were such a centralized authority capable of dealing with the situation as a whole, it is nevertheless important in the opinion of the receiver to consider the necessities of the situation as a whole with a view to meeting it as fully as existing law permits.

COMPARATIVE INCOME ACCOUNT OF BROOKLYN RAPID TRANSIT CO.

	From Jan. 1, 1919, to Nov. 30, 1920	Five Months to Nov. 30, 1920	Month of November, 1920
Total revenue	$30,380,838	$6,505,821	$1,339,383
Total operating expenses	26,867,980	5,238,490	1,082,127
Revenue over operating expenses	$3,512,858	$1,267,331	$257,256
Total taxes	469,156	104,784	20,961
Revenue over expenses and taxes	$3,043,700	$1,162,546	$236,294
Total income deductions	*1,999,170	*641,716	*128,341
Surplus	$1,044,530	$520,830	$107,952

*Does not include interest on any bonded indebtedness.

Limitations of space prevent more than an indication of the general contents of the report. Separate figures of operation are presented for the various companies included in the system from Jan. 1, 1919, to Nov. 30, 1920, for the five months to Nov. 30, 1920, and for November, 1920, together with detailed statements of the obligations of the various companies, interest in default, taxes and other claims unpaid, facts about changes in fares such as the changing of an extra 5 cents on certain lines, results with one-man cars, etc.

The comparative income statement of the Brooklyn Rapid Transit Company for the periods previously referred to, as condensed by the ELECTRIC RAILWAY JOURNAL, is shown in the accompanying table.

The separate statement of the Nassau Electric Railroad for the five months to Nov. 30, 1920, includes strike expenses of $342,246 in the item total street railway operating of $2,390,699. The similar statement of the Brooklyn, Queens County & Suburban Railroad includes strike expenses of $101,621. The statement of the Coney Island & Brooklyn Railroad includes $127,981 for strike expenses. Similar figures for the New York Consolidated Railroad are $1,271,543, making the total direct strike loss $1,847,393. Indirect losses are estimated at $720,000 additional. These are exclusive of the Brooklyn City Railroad, returned to its owners.

The detailed statement as to the bonded indebtedness (including bank loans secured by bonds) of the Brooklyn Rapid Transit Company and the interest in default thereon shows that there is an outstanding indebtedness against the property company of $73,255,000, excluding indebtedness to constituent companies aggregating $6,427,437 (and interest due thereon of $648,579). All of this indebtedness is in default and, as of Dec. 31, 1920, there is interest in default on the said indebtedness of $11,652,358. Foreclosure proceedings have been brought by the trustees of all of the several mortgages of the Brooklyn Rapid Transit Company.

In addition to the foregoing bonded indebtedness, there is also the indebtedness created by the receiver's certificates, of which at the present time $5,000,000 in principal amount are the sole indebtedness of the receiver.

INDEBTEDNESS OF BROOKLYN RAPID TRANSIT COMPANY

Nature of Debt	Issued	Owned	Pledged	Net Outstanding	Annual Interest
First mortgage 5 per cent bonds	$7,000,000	$5,000	$25,000	$6,970,000	$348,500
First refunding mortgage 4 per cent bonds	27,621,000	5,092,000	17,329,000	5,200,000	208,000
Consolidated mortgage 6 per cent bonds	29,000,000	291,327	28,708,672	....	....
Total bonded indebtedness	$63,621,000	$5,388,327	$46,062,672	$12,170,000	$556,500
Three-year 7 per cent gold notes	$57,230,000	....	....	$57,230,000	$4,006,100
Six-year 5 per cent gold notes	505,000	....	....	505,000	30,300
Bills payable, banks and trust companies	3,350,000	....	....	3,350,000	201,000
Total notes and bills payable	$61,085,000	....	....	$61,085,000	$4,237,400
Grand total	$124,706,000	$5,388,327	$46,062,672	$73,255,000	$4,793,800
Exclusive of bills payable to constituent companies					6,427,437
Interest thereon to Dec. 31, 1920					648,579

The statement of bonded indebtedness and notes and bills payable of the Brooklyn Rapid Transit Company is shown in the accompanying table.

There are also claims against the company for debts arising prior to the receivership under contract (exclusive of bank loans, notes, bonds and inter-company claims) by 522 creditors for an aggregate amount of $775,181, upon which there is an admitted liability of $749,382, and liability for the balance of $25,798 is in question. No claims have been filed against the company for tort damage.

The application shows that the Nassau Electric Railroad receiver has suspended in whole or in part the operation of the following lines:

Ocean Avenue (in part).
Rogers Avenue.
Church Avenue.
Seventh Avenue.
Park Avenue.
39th Street-Coney Island (in part).
Hicks Street.

The Brooklyn, Queens County & Suburban Railroad receiver has suspended in whole or in part operation of the

Metropolitan Avenue line (in part).
Wyckoff Avenue line.
Ralph Avenue shuttle line.

The Coney Island & Brooklyn Railroad receiver (in conjunction with the Nassau receiver and the Brooklyn City Railroad) has ceased operating the experimental Park Slope Line.

The application shows that the following additional lines are failing at the present time to earn even their direct operating expenses:

Wilson Avenue line.
Ralph-Rockaway line.
Eighth Avenue line.
Vanderbilt Avenue line.
West End Avenue line.
Eighty-sixth Street line.
Ocean Avenue line.
Broadway line.
Jamaica Avenue line.
Reid Avenue line.
Broadway-Ferry shuttle.
Metropolitan Avenue line.
Utica Avenue line.
Franklin Avenue line.
Smith Street line.

The application shows that having, under the order of the Public Service Commission and the Supreme Court, purchased seventy-three safety cars and having paid on account thereof in cash the amount of $170,703, the Nassau receiver, for lack of funds, has had to default on his car lease warrants issued for the remaining installments of purchase price which amount to $299,647, and that he is in danger of having the cars taken away from him, losing both the cars and the money.

The application shows that there has been a 35 per cent increase in wages since the appointment of the receiver; adding approximately $4,700,000 to the cost of operation during receivership.

In addition to wage increases the cost of operating during receivership was increased by the advance in the price of coal from $3 per ton to $9 per ton and substantial advances in other prices.

The application points out that the property of each individual company in receivership and the income therefrom must be separately administered for the benefit of each company's particular creditors so that neither the funds nor the property of any one receivership can be used for the benefit of any other receivership.

The petition of Mr. Garrison to the court was heard by Judge Mayer on Feb. 14. At that time two new phases of the railway situation were disclosed. One was the suggestion that the 5-cent fare should be confined to surface lines operating within the borders of the old city of Brooklyn and the other that Mr. Garrison had prepared papers in an action against the city for approximately $20,000,000 for losses incurred because of the city's delay in completing the dual system, a part of which the Brooklyn Rapid Transit Company is to operate under Contract 4. The discussion lasted for more than three hours.

The suggestion that the area of the old city of Brooklyn before consolidation should constitute one 5-cent fare zone and all of the numerous towns that make up the present Brooklyn Borough another 5-cent fare zone each came in a flurry of argument of how to keep in operation fifteen surface lines that could not support themselves.

Financial News Notes

Refunding Issue Offered.—Tucker, Anthony & Company, New York, N. Y., are offering at 96¼ and interest to yield about 7.30 per cent $914,000 of 7 per cent first refunding mortgage sinking fund gold bonds of the Manchester Traction, Light & Power Company, Manchester, N. H. The bonds are dated Aug. 1, 1917, and are due Aug. 1, 1952. The purpose of the issue is to refund a like amount of consolidated mortgage 5 per cent bonds due April 1, 1921. After April 1, 1921, the refunding mortgage sinking fund gold bonds now being offered will be a first lien on the property.

Road Saved from Scrap Pile. — The Carlisle & Mt. Holly Railroad, Carlisle, Pa., has purchased from McGovern & Company, New York, the 7-mile electric railway between Carlisle, Pa., and Mt. Holly, Pa. This road was formerly operated by the Cumberland Railway, which sold all its track and rolling stock to the McGovern Company. Mention of this sale was made in the ELECTRIC RAILWAY JOURNAL for Dec. 18, 1920. The line between Carisle and Newville, Pa., will be torn up and sold for scrap in the spring. Thomas MacDonald is president of the new company. H. M. DeLone is secretary and treasurer.

Additional Defendants in Restitution Suit. — The suit brought by Ella Van Deusen against the Maumee Valley Railways & Light Company, which resulted in the company being placed in the hands of Raleigh D. Mills, as receiver, was enlivened when Thomas H. Tracy, one of the defendants named in the original suit, asked in a cross petition that seventeen additional defendants be brought into the suit. The suit is a test to determine whether the original stockholders can be made liable for $900,000 of debts including matured bonds and for money due under the double liability clause in stock subscriptions.

E. A. McNutt a Barcelona Director. —Following the regular annual meeting of the stockholders of the Barcelona Traction, Light & Power Company at Toronto, Ont., a special general meeting ratified a new by-law of the directors removing the compulsory feature which had been provided for the redemption of a certain amount of preferred stock each year. The change was made coupled with the provision that the company may redeem preferred shares at 110 at any time it sees fit. E. A. McNutt, of the Sun Life Insurance Company, Toronto, replaces T. B. Macauley, president of the Sun Life, as a director of the utility at the latter's request.

Senate Modifies Valuation Measure. —Court review of the valuation to be fixed by the engineering firm engaged by the New Jersey Valuation Commission is provided for under the Senate Mackay bill adopted by the New Jersey Senate. Senator Parry, of Essex County, fought the bill, urging his measure, which would not make mandatory the valuations fixed by the appraisers. Mr. Parry argued that the engineers' report on the value of the Trenton & Mercer County Traction Corporation and the Public Service Railway should only be considered by the Public Utility Commission as an element in arriving at a basis of fares. The Mackay measure would make the valuation mandatory.

Extension of Time for Readjustment. —The depositors of the first mortgage 5 per cent sinking fund thirty-year bonds of the Albany Southern Railroad, Hudson, N. Y., who had entrusted their securities with the Bankers Trust Company, New York, have been notified that the time in which the plan for the financial readjustment of the company may be declared operative has been extended to June, 1921. This extension applies also to the privilege of depositing bonds under the plan. It is also announced that the first refunding bonds to be issued under the amended plan will bear interest from March 1, 1921. Payment of the coupon due on that date on the bonds on deposit with the Bankers Trust Company will be made by the company to registered holders of certificates of deposits.

Treasurer Unaware of Sale Negotiations.—The Watertown (N. Y.) *Standard* said, in a recent issue, that according to a rumor in circulation in that city the Northern New York Utilities, Inc., was negotiating for the purchase of the property of the Black River Traction Company. It was said that the utilities would purchase the railroad and extend it to Carthage through Black River, Felts Mills, Great Bend, Deferiet and Herrings, thus linking up this chain of small industrial villages between Watertown and Carthage and paving the way for the development of the section. Richard Krementz of Krementz & Company, Newark, N. J., treasurer of the Black River Traction Company, asked by the ELECTRIC RAILWAY JOURNAL to confirm the report contained in the *Standard*, said it was all new to him.

Operating Organization Provided by Court.—Approval of a contract entered into between Henry C. Paul, receiver for the Fort Wayne, Van Wert & Lima Traction Company and the Indiana Service Corporation, whereby the latter is to supply officials for the maintenance and operation of the Fort Wayne, Van Wert & Lima Company for the next six months, or as long as the receiver deems necessary, was made by Judge A. B. Anderson, in Federal court at Indianapolis recently. Mr. Paul, in his petition to the court, alleged that the Fort Wayne, Van Wert & Lima Traction Company is now and has for some time been operated by the Ohio Electric Railway under a lease, and had not left any officials in charge and in order to continue the operation of the road it would be necessary for these officials to be selected. He says the Indiana Service Corporation has offered the interurban the service of its general manager, engineer of maintenance, superintendent of transportation and engineer of distribution.

Duluth Company Reports to City.—Herbert Warren, vice-president and general manager of the Duluth (Minn.) Street Railway, has filed with the city auditor the report of the company for the year ended recently. The total revenue. derived from transportation last year was $1,477,912. By far the largest portion of this, $1,476,145, was derived from fares paid, and the balance came from mails, chartering cars and other sources. The total revenue from other railway operations is listed at $8,140. This makes the total operating revenue $1,486,053. Added to this is non-operating revenue of $19,924. The total revenue of the company for 1920 is shown as $1,505,977. The total operating expense of the company, including taxes, interest of funded debt and miscellaneous debits, was $1,419,466. The reports shows that $86,511 is available for sinking funds, additions to property and distribution. The sums of $60,000 for dividends and $18,946 for expenses was transferred to the Duluth-Superior Traction Company, which controls the local lines in Duluth. The capital liabilities of the company are $3,942,643, included in which are $1,200,000 of stock and $2,516,590 of bonds.

Traffic and Transportation

Fares Before Referee

Railway at Fort Worth Wants to Retain Seven-Cent Rate—Asks Ten per Cent Return

The Northern Texas Traction Company, Fort Worth, Tex., is combatting the city's order to reduce fares from 7 cents to 6 cents. The city charter of Fort Worth and the franchise granted the Northern Texas Traction Company, permit the company to raise fares without authority from the city government, but the city has the right to investigate and determine the reasonableness of the fare. This the city is now doing.

The city issued an order directing the company to reduce its fares to 6 cents. Upon the refusal of the company to comply with this demand the city, after negotiations with the company, appointed N. A. Dodge, Fort Worth, as referee to conduct an investigation and hear testimony from both sides and to determine the reasonableness of the 7-cent fare. He has been conducting hearings bearing on the valuation of the company's property, the earnings, operating costs and other factors that enter into the question of reasonableness of the fare charged.

TEN PER CENT RETURN SOUGHT

In its opening statement the company's attorneys admitted the right of the city to regulate fares and to see that they permit only a reasonable amount of return. This right, however, counsel maintained, is limited by the Constitution of the United States which guarantees protection against confiscation through the imposition of an unreasonable rate, and that the right of protection extends not only to the title of the property itself, but also to a fair and equitable rate of return on the invested capital.

The "fair rate of return" asked by the traction company's counsel in this instance was 10 per cent, and it was declared that "any rate fixed by the public authorities so low as to yield insufficient revenue to pay operating costs and leave for the owner a fair return on the value of the property devoted to the public service, is not only unfair and unreasonable, but is also confiscatory."

The attorneys declared that they would show that anything less than a 7-cent fare would not yield a fair return and would in effect be confiscatory.

H. P. Gillette, expert for the company, taking the 1915 appraisement as a basis and adding to it the cost of additions since made, declared the historical value of the property to be $6,182,468. Its reproduction value as of Jan. 1, 1921, taking the Interstate Commerce Commission table of items as a basis, he placed at $11,575,513.

Counsel for the city took issue with Mr. Gillette as to the reproduction theory of fixing valuation for rate-making purposes, and Mr. Powell declared that such theory did not afford a fair rate-making basis.

George H. Clifford, vice-president and general manager of the company, declared that at no time in the history of the company had it earned a fair return. Starting with 1917 he declared there had been a big increase in the company's expenses, due to the rise in wages and the cost of materials, yet despite this no increase in fares had been made until May, 1920.

REFERRED TO REFEREE

When the hearing was concluded, Mr. Dodge, the referee, took the matter under consideration.

Dime Fare in Worcester

An order dated Feb. 4, has been issued by the Massachusetts Department of Public Utilities authorizing an increase in fares on the Worcester Consolidated Street Railway. The increase affects both the city of Worcester and outlying lines. The order also abolishes certain transfer charges heretofore collected. The new rates took effect on Feb. 6.

The order provides for a 10-cent flat fare in the city, abolishing the former two-zone system in which 7-cent fares were charged in each zone. Free transfers are established throughout the new flat-fare area which includes the whole area formerly divided into two zones. The order also establishes 7-cent fares on all suburban lines where the fare was formerly 6 cents. Transfer charges are abolished on lines operated from Beacon Park and from North Village through the center of the town of Webster to Perryville.

Proposals were made by Mayor Sullivan of Worcester to reduce fares in the city zones to 5 cents for the first zone and 3 cents for the second zone, on the ground that increased riding would result in greater revenue to the company at no addditional expense. This proposition was subjected to analysis by the commission, which concluded that even though additional riders could be carried without additional cost, it would require an increase of 37 per cent in the actual number of passengers carried to even equal the revenue received during the past year. In that year 38,045,575 revenue passengers were carried in one zone and 6,713,926 in the second zone. It was established that the Worcester Consolidated Street Railway would require a minimum of $199,274 additional revenue to meet its expenses during the present year, without any allowance for depreciation or profit to the road.

Five Cents Suggested

Bridgeport Committee Wants This Basic Fare — Desires Railway's Obligations Be Reduced

The special transportation committee appointed some time ago by Mayor Clifford B. Wilson of Bridgeport, Conn., presented a comprehensive report to the Common Council on Feb. 7. The recommendations made will be referred to the legislative committee of the Council for presentation to the Legislature. The committee recommends a return to the 5-cent fare by the Connecticut Company as the best solution of Bridgeport's trolley tangle.

In submitting its report the committee explains the failure of the 10-cent fare either to increase the company's revenue or to restore the good will of the car patron. It believes that under a zone plan with a basic 5-cent fare and "harmonized" zone transfers the problem could be settled profitably for the company in increased revenue and for the public in better service. The committee approves of a 6-cent cash fare or a ticket plan whereby twenty tickets are sold for $1. The ticket system is urged both as a matter of safeguarding the company's revenue and as a measure of safety and expedition in the operation of one-man cars.

RESULTS OF INTENSIVE STUDY

The committee has studied carefully the subject of bus competition, taxation, etc. It concluded that:

1. The 5-cent fare should be restored between city center and city limits, with a compulsory ticket system under which 20 tickets could be purchased for $1.
2. The recommendations of the Public Utilities Commission should stand in regard to division of the Connecticut Company into complete operating and accounting units.
3. The State should be divided into five regions grouped about the large cities in which electric railway business centers; these regions center about Hartford, Waterbury, Norwich, New Haven and Bridgeport.
4. A deputy should be appointed by the Public Utilities Commission to supervise all railway and bus traffic within each region and be amenable to the authority of the Public Utilities Commission only. This supervisor should make reports twice a year to the Public Utilities Commission.
5. The recent suggestions of the Public Utilities Commission should be put into effect regarding removal of street paving and highway bridge obligations from the railways.
6. The recent recommendations of the Public Utilities Commission should be put into effect in regard to taxing railways on net earnings and making the same demands upon bus companies as on railways in regard to taxation, financial reports, etc.
7. The street railways should be permitted to operate buses.
8. The Public Utilities Commission should grant bus lines franchises for interurban routes and that the city should grant franchises for city bus lines only after public hearings, with the right of appeal to Public Utilities Commission within thirty days if permit is rejected.
9. Public motor bus lines must furnish protection for passengers through liability assurances carried by the operators.

The committee explains that it is not intended to imply that the 5-cent unit fare should cover the same zones as were in effect originally. It suggests rather that the zones be arranged to conform to the value of the fare paid and to centers of traffic like the city center and to important industrial locations. It suggests working out these zones under the plan of supervision which the committee itself recommends.

Bus Injunction Held Unwarranted

Application of Public Service Railway of New Jersey for Relief Called Groundless in Report of Vice-Chancellor

No ground exists for the granting of an injunction to restrain the operation of jitneys competing with the Public Service Railway of New Jersey, according to an opinion filed in the State Court of Chancery by Vice-Chancellor Griffin on Feb. 10. The Vice-Chancellor held that under the cases bearing on the subject matter of the controversy the Public Service Railway has no cause to enjoin competing carriers from using the public streets. He accordingly advised that a decree be handed down dismissing the railway's petition. The railway on June 3 last instituted legal proceedings to halt ruinous jitney competition with its lines. Thirty-six bus operators and a number of municipalities, including the city of Newark, were named in the action as defendants. The railway contended that the buses were operating in violation of the Kates act regulating vehicular traffic and that their operation should be discontinued in the interest of both the railway and the community.

IN THE suit the complainant made no point of the use made by jitneys of its tracks, but based its right to relief on the sole ground that the defendants are illegally operating jitneys in the streets of Newark and other communities, to complainant's "great loss and damage," and that "this illegality gives it a right to an injunction."

TWO QUESTIONS INVOLVED

The proposition thus presented the Vice-Chancellor divides into two questions:

1. Has the defendant a lawful right to carry on the business of a common carrier of passengers for hire in the public streets?
2. If the defendant is without such right may the complainant maintain its bill to restrain on the ground that the competition is unlawful and complainant is suffering an irreparable injury therefrom?

Complainant, he says, contends for the negative on the ground that the defendant has not the consent required under the Kates act, and that the consent granted by Newark is null and void because it was not granted in the manner provided by the Kates act and also by the limited franchise act.

Merritt Lane, counsel for the defendant, contended that the consents from the municipalities are valid, even though not granted in the manner directed by the limited franchise act. He argued further that even if the consents were not lawfully granted the complainant had no standing to object.

In the view he takes of the case, the Vice-Chancellor says, it was not necessary to determine the validity of the consents, because the case could be decided upon the second proposition.

KATES ACT IN PUBLIC INTEREST

Of the Kates act the Vice-Chancellor says it is quite clear that it was passed "for the protection of the public, and for revenue. And it nowhere appears that it was enacted in any manner for the benefit of street railways." "This," the Vice-Chancellor says, "leads to the question whether, if the consent be invalid, the complainant may for its own advantage assert this invalidity." The opinion follows in part:

> The right of the people to use the public highways of the State freely and without hindrance, subject only to proper police regulations, unless the Legislature should otherwise ordain, is unquestioned, and in the exercise of this right the people are not exercising a franchise.
>
> Thus persons complying with the Kates act do not acquire a franchise to use the public highways. The act is prohibitive in that it takes away rights formerly possessed; and permissive and regulative in that it authorizes the use upon complying with the terms of the act. The plain purpose of the act was primarily not to license, but to regulate and control the operations of these vehicles in the crowded streets of cities for the public benefit and safety, and for revenue. It was not passed for the benefit of street railways.

HIGHWAYS PUBLIC PROPERTY

> The franchise of the complainant is as to its tracks and ways, and gives it the exclusive use thereof as against competing carriers, in the manner indicated in Camden Horse Railroad against Citizens Coach Company. It has no grant outside of the tracks and ways, and, therefore, when it seeks to enjoin competing carriers from using a highway in a manner declared lawful . . . I feel bound, following Elizabethtown Gas Light Company vs. Green, . . . to hold that it has no standing in this court to ask for injunctive relief.
>
> This conclusion is reached regardless of whether the defendant is operating his auto buses without having the consent required under the Kates act, and is guilty of a misdemeanor.

One-Man Cars in Boston

The first double-truck one-man cars ever operated in the city of Boston made their appearance on Sunday, Feb. 6, when the Eastern Massachusetts Street Railway inaugurated this service on the Woodlawn-Chelsea-Scollay Square line. The normal weekday service consists of four of these cars on twenty-minute headway, while rush-hour schedules call for eight cars.

Another novel feature of this service, so far as Boston is concerned, is the adoption of the pay-leave system on outbound trips of these one-man cars. As the in-town terminus is at Scollay Square, in the old subway, where the prepayment system has not been adopted by the Eastern Massachusetts Street Railway, and as other heavy loading points are also found outside the subway, it was decided to try the pay-leave system, and reports thus far received indicate that it is entirely successful.

The double-truck one-man cars in use are former two-man cars converted in the company's own shops. Although these are the first to go into service on lines in Boston the Eastern Massachusetts Street Railway has been converting double-truck cars for a considerable period, and already has about 300 in operation on various parts of its system. It has already operated about 2,000,000 car-miles with this type of converted double-truck one-man car. These cars are equipped with a special device, approved by the Massachusetts Department of Public Utilities, to enable the operator or any passenger in an emergency to open the rear doors by pulling on a cord, similar to the ordinary bell cord, running the entire length of the car.

Nine Cents in Cincinnati

New Rate Goes Into Effect March 1—City Street Railway Commissioner Planning Protest

Fare on the lines of the Cincinnati (Ohio) Traction Company will be raised another half a cent, to 9 cents, effective March 1. Walter A. Draper, vice-president of the company, following several conferences with officials and lawyers of the company made this announcement, saying it was the intention of the company to increase the fare because of an existing deficit.

The deficit for the months of December and January, the traction company announced, is approximately $100,000. The accumulated deficit of the company to date is about $650,000.

Under the franchise the 9-cent fare will be in operation from March 1 to May 30. Should the receipts for March and April show a deficit the company has the right under the franchise to advertise a further increase of half a cent on May 15, making the fare 9½ cents effective on June 1. A fare of 10 cents would be reached on Sept. 1, providing the reports showed a deficit for the months of June and July.

SUIT NOW PENDING

City Street Railway Director W. C. Culkins, following a conference with the city solicitor and Mr. Draper, said:

> I have placed before City Solicitor Saul Zielonka certain information which, I believe, shows that the increase in fare to 9 cents announced by the traction company is not warranted.

Mr. Zielonka stated after studying all the information Mr. Culkins supplied him that he will determine whether he would be warranted in bringing a suit to enjoin the fare increase.

A suit now pending in the courts would, if decided in the city's favor, obviate the necessity of a fare increase. This action was brought at the request of Mr. Culkins, who demands an accounting from the Cincinnati Traction Company, the Ohio Traction Company and the Cincinnati Car Company, of transactions among them in which it is charged the latter two companies benefited at the expense of the first named to the extent of $350,000.

Mr. Culkins questions the deficit of the traction company saying:

> I am not prepared to admit that any deficit exists if proper adjustments are made by the company.

Louisville Goes to Seven Cents

In a signed statement issued in announcement form on Feb. 16 the Louisville (Ky.) Railway, over the signature of President James P. Barnes, announces that starting at 4 a.m., Feb. 21, fares will be increased from 5 to 7 cents.

This announcement followed advice of Federal Judge Evans in an opinion in the case of the Louisville Railway vs. the Mayor and City Attorney, to prevent interference with an increase in fares, the company having asked for an injunction in the Federal Court.

Judge Evans held that a restraining order could not be issued until the need becomes actual instead of abstract, and advised the plaintiff to put the increase into effect immediately so that action may be taken. The original bill for relief included the Common Council in its citation, but was amended to take in the City of Louisville, the Mayor and the City Attorney.

One-Man Cars on All Lines

One-man cars were recently placed in operation on the Hillyard line of the Washington Water Power Company, Spokane, Wash. This change marks the passing of the two-man car on the Washington Water Power System. Seventeen of the big cars formerly used have been converted to the one-man type. The near-side stops have replaced the far-side stops. The company was one of the first electric railways in the country to adopt the one-man car for general use. The first cars were converted about five years ago. Since that time the company has steadily pushed the conversion until last year all its cars except those on the Hillyard line were in charge of one man each. The Hillyard cars are the largest of the system and are believed by company officials to be among the largest one-man cars operated anywhere in the country. It has been the experience of the management that the larger cars are more economical in operation than the smaller ones.

Ten-Cent Fare Asked in Denver

E. Stenger, receiver for the Denver (Col.) Tramway, on Feb. 11 petitioned the United States District Court, District of Colorado, for an advance in fares from 6 to 10 cents for adults and from 3 to 5 cents for children. Arguments on the petition will be heard by Judge Robert E. Lewis on Feb. 16.

The petition sets out that the company is laboring under a burden of high costs of operation, struggling with inadequate and worn out equipment in an attempt to render satisfactory service to the public, with the possibility of confiscation of the property unless fares are advanced and that the company is carrying a tremendous load of debt which is constantly expanding.

While agreeing that the city under its police powers has the right to regulate the rate of fare the receiver contends that it must not force the company to charge a fare that is confiscatory. Permission is asked of the court to give up the franchise obtained in 1906 for a period of twenty years, declaring it to be worse than useless to the company. Franchises granted the company in 1885 and 1886 without time limit, accord the company practically the same privileges as the 1906 franchise.

Transportation News Notes

Fare Election Declared Illegal.—The election held in Shreveport, La., last May authorizing the Shreveport Traction Company to increase its fare from 5 cents to 6 cents to remain in effect until Dec. 31, 1923, has been declared illegal by Judge J. R. Land of the Circuit Court at Shreveport. The 6c. fare had been in effect for several months.

Interurban Wants More.—John E. Zimmerman of the firm of Day & Zimmerman, Philadelphia, Pa., recently appeared at a public hearing in Alexandria, Va., to explain the need for increased rates on lines of the Washington-Virginia Railway. The company has applied to the Interstate Commerce Commission for permission to increase its rates. The railway wishes to retire its 25-trip ticket book and to increase the price of a fifty-two-trip book between Washington and Alexandria from $4.46 to $5.58. Other proportionate increases have been asked.

Court Ends More Transfers.—Federal Judge Hough recently signed an order restraining officials of the city and state of New York from seeking to prevent the Fifty-ninth Street Crosstown Railway from discontinuing the exchange of transfers with the Sixth, Seventh, First, Second and Lexington Avenue lines. The company is part of the Third Avenue Railway system. The court stated that to compel the company to continue the transfer system would violate the law, because it would be confiscatory, and stated that the company received only 2 cents from each transfer passenger and that it cost 3.96 cents per passenger, to say nothing of more than half a cent additional needed to meet interest on borrowed money.

Would Retain 7-Cent Fare.—Officials of the Indiana Service Corporation, Fort Wayne, Ind., recently appeared before the State Public Service Commission at a hearing on the company's application for authority to continue to charge a 7-cent fare on the Fort Wayne city lines. The 7-cent fare took effect on Sept. 15 last. The rate was formerly 5 cents. Figures were submitted to the commission showing that during the months of October, November and December, with the 7-cent fare in effect, a total of 3,914,895 passengers were carried on the Fort Wayne city cars. This was a decrease of 6,331 from the number carried in the same period of 1919. Passenger revenue during the three months totaled $248,810, which was an increase of $52,805 over the corresponding three months of 1919. An increase of 58,985 car-miles was shown. Operating expenses amounted to $211,296, an increase of $62,738. Data were also submitted showing that the average return on the investment for the last three months of 1920 was 6.75 per cent. During January, 1921, the number of passengers carried was 146,917 less than during January, 1920, while passenger revenue dropped $9,996.

Ten Cents in McAlester.—The Oklahoma Corporation Commission granted permission to the Pittsburgh County Railway, McAlester, operating city and interurban lines, to increase its rates, effective Feb. 15. The rate for the McAlester city lines and for territory west of the city to the state penitentiary is fixed at 10 cents single fare or three rides for 25 cents. A 5-cent fare is granted for students traveling to and from public or Sunday schools. Twelve tickets will be sold for $1 good between any two points on the interurban lines where the regular cash fare was 10 cents. A complete new set of rates is also made for interurban traffic and for express and baggage shipments. The commission found, in making its order, that present owners had never made sufficient profits to pay operating expenses and taxes, provide for depreciation and earn a reasonable return upon the capital invested. It also found that the cost of coal and electric current used for power had increased more than $25,000 per annum.

Railway Defendant in Suit.—Alleging breach of contract and claiming that the 7-cent fare has worked irreparable injury to the development of its land the Ortega Company recently filed an injunction in the Federal Court for the Southern District of Florida to restrain the Jacksonville Traction Company from maintaining a 7-cent fare. The Ortega Company, which built the line, states that when it sold the franchise to the Jacksonville Traction Company, it was on the condition that a 5-cent fare would be the maximum fare charged. The company, being engaged in the development of land in the section served by the traction company, and since it was for the purpose of furthering the sale of these lands that the 5-cent fare was contracted for in the agreement, claims that the railway has broken its contract even though the Railroad Commission authorized the increase in fares. Receiver Triay as defendant has filed a motion for dismissal of the proceedings alleging that under the Supreme Court's decision instructing the Railroad Commission to assume jurisdiction, no binding contract can be made with a municipality or individual by a railroad or common carrier. It is also contended in the receiver's motion for dismissal that private contracts and obligations must yield to the welfare of the public.

Personal Mention

Operating Skill Recognized

G. B. Anderson Appointed Manager of Transportation Los Angeles Railway —F. H. Van Vranken Promoted

For the second time within one year promotions have come to George B. Anderson and F. H. Van Vranken of the Los Angeles (Cal.) Railway. Under the new plan of organization recently announced by G. J. Kuhrts, general manager, Mr. Anderson, who has served as manager of service, is made manager of transportation, while Mr. Van Vranken, general superintendent of the railway since May 1 of last year, becomes assistant to the general manager.

The position of manager of transportation supersedes that of general superintendent and gives Mr. Anderson direction of the entire operating department. Mr. Anderson joined the Los Angeles Railway forces three years ago as director of public relations. Since that time he has advanced rapidly. He has the unique record of having been more than fifty years old when he entered the electric railway industry and of having had no previous experience in any phase of the transportation business. He established the merit system, under which trainmen receive credits and demerits according to their grade of service rendered. These marks are the basis upon which a yearly bonus is paid.

G. B. ANDERSON

Mr. Van Vranken, who becomes assistant to the general manager, was born in Schenectady, N. Y., in 1865. At the age of nineteen years he became a brakeman with the Southern Pacific. He served that road successively as brakeman, freight conductor, yardmaster and passenger conductor. In 1902 he was appointed division superintendent of the Pacific Electric Railway, continuing in that capacity until 1911, when he resigned to join the Los Angeles Railway as assistant superintendent. Two years later his title was changed to assistant to the general superintendent. He continued to serve in that capacity until his promotion to general superintendent last May.

Several other changes in the operating personnel have been announced by General Manager Kuhrts. R. B. Hill continues as superintendent of operations. Mr. Hill has held this position since Oct. 1, 1919. R. R. Smith is made assistant superintendent of operations. Mr. Smith entered the employ of the railway in 1904 as a motorman. Three years later he was transferred to the instruction department, and was appointed chief instructor on Jan. 1, 1919.

The position of chief instructor now rests with R. A. Pierson. Mr. Pierson joined the Los Angeles Railway seventeen years ago. Starting as a motorman, he was soon made a dispatcher, and for the past seven years has been in the instruction department. He will be aided by Daniel Healy, who has been given the title of assistant chief instructor. Mr. Healy has been in the service of the railway for the past sixteen years.

Guy D. Wheelock has been appointed superintendent of schedules. Mr. Wheelock was formerly chief dispatcher.

W. J. Van Valkenburg has been made efficiency statistician. Mr. Van Valkenburg has been in the office of Mr. Anderson, now manager of transportation, for several months past.

A. K. Plummer continues as traffic director. A change will be made in the work of the traffic supervisors by dividing the city into three districts, with a supervisor in charge of each district and certain men assigned regularly to each zone. These three district superintendents are J. G. Owen, J. A. Bodley and W. H. Snyder.

Changes in Alabama Road

J. H. Bowles, master mechanic of the Anniston Division of the Alabama Power Company, has been transferred from Anniston to occupy a similar position with the Gadsden Division. M. D. Payne, superintendent of the Gadsden Division, has been placed in charge of transportation and maintenance of way. These changes come as a step toward a reorganization of the operating end of the street railway in Gadsden as announced by the Alabama Power Company. Division Manager Barry, of Anniston, and J. S. Sutherland, of the main office at Birmingham, will spend several weeks there to personally superintend the work and to study the problems that confront the management.

E. M. Graham, President

Youthful Maine Operator Chosen President of the Bangor Railway & Electric Company

Edward M. Graham was elected president of the Bangor Railway & Electric Company, Bangor, Me., at a meeting of the board of directors on Feb. 9. Mr. Graham has filled the position of vice-president and general manager of the railway, and will continue as general manager. Herbert L. Clark, of Philadelphia, was elected vice-president and E. C. Ryder, the former president, will act as general counsel.

When in 1915 Mr. Graham succeeded his father, the late John R. Graham, as the active operating head of the Bangor Railway & Electric Company the Bangor Power Company, the Orono Water Company and the Bar Harbor & Union River Power Company he was only twenty-six years of age and was one of the youngest general managers in the country to have charge of so extensive a property. The younger Mr. Graham gained his practical knowledge of railway and central station management through an experience of several years under his father.

E. M. GRAHAM

He began his career with the Eastern Massachusetts Street Railway, at that time the Bay State Street Railway, which he served in various capacities. At the age of twenty-two years he was made superintendent of the Portland & Brunswick Street Railway and a little later became assistant to the general manager of both the Lewiston, Augusta & Waterville Railway and the Cumberland County Power & Light Company, these being among the large public service corporations of Maine.

Mr. Graham went to Bangor in 1913 as assistant to his father, then the president and active head of the utility properties centering in that city. He has been with the company there ever since. The companies of which Mr. Graham is now president and general manager operate electric railway lines in nine municipalities, in addition to providing sixteen cities and towns with light and power and six with water.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Lower Prices on Pole Line Hardware

Present Demand Light, but Manufacturers Are Hopeful of Good Business Ahead—Prompt Shipments

Following price reductions of 5 to 15 per cent on pole-line hardware that went into effect during December and early January, as mentioned in last week's issue, prices have further declined. General reductions on the entire line, ranging from 5 to 7½ per cent, were put into effect by leading manufacturers on Feb. 15. It is hoped that this reduction will have some effect upon consumers in the way of inducing them to buy, as until the present time demand has been very light. With the closer approach of spring, however, manufacturers are hopeful that the program of extensions on the part of utilities will result in a better market.

In anticipation of this producers are continuing production so as to accumulate reserve stocks. These have been rather low in the past, but should now build up in good shape. Deliveries are considered entirely favorable, being from stock in most instances. In others shipment is not longer than ten days to two weeks.

Insulation Market Remains Quiet

Price Reductions Since First of the Year Have Not Helped Buying—Manufacturers Not Stocking

Little increase has been noted in the buying of fabric insulation and compounds, etc., during the year up to date. Although it is stated that the number of orders which manufacturers are receiving is about normal, at the same time the amount of each order is still disappointingly small. A normal number of bills are sent out each month, but for small figures. Factory production is down pretty near the 50 per cent mark.

Cotton webbings are moving slowly, although recent price decreases of about 18 per cent have been applied. There is some distributer stocking of this class of insulation, as it is thought the bottom price has been reached. Cotton sleeving has undergone several price reductions since the first of the year and is now said to compare favorably with pre-war prices. Compounds of finishing insulated wires are moving fairly well and sales have increased in February over January. Shellacs and varnishes are going slowly.

Varnished silk has little call at present, and its price has held steady since the revisions reported in January. Varnished-cambric tape and cloth are about 10 per cent lower than last quotations made the latter part of January, and the demand is not well sustained. There is little manufacturing for stocks beyond what is deemed necessary to supply immediate future needs. That is, no future production on a large scale is being attempted even with a good outlook for summer business.

Further Decrease in Price of Overhead Line Material

Several Manufacturers Drop Prices 10 per Cent Following General Reductions Made Last Month

Still further price reductions have been made on trolley ears, crossings, splicers, hangers, etc., by several manufacturers. The latest decrease is 5 per cent, effective Feb. 15, and follows reductions ranging from 5 to 15 per cent that were made by almost all manufacturers during the first two weeks of January. Not all producers of overhead line material have announced a new decrease in price, but it seems more than likely that these others will fall in line shortly too.

The market for this class of material remains quiet on the whole, orders being mostly for current maintenance work rather than for the purpose of accumulating stock. Some manufacturers are experiencing a fair current business nevertheless. Deliveries are about all that can be desired.

Charters Granted for Traction Construction in Japan

According to advices from the Guaranty Trust Company of New York, charters have been granted for rail and tramway construction as follows: To the Kanaiwa Electric Tramway for an electric tramway between Ono and Kanaiwa, Ishikawa prefecture; to the Fukutake Electric Tramway for a line between Fukui and Takefu, to the Mito Kaihin Electric Tramway for a line between Mito and Isohama, to the Seto Electric Railway for a line between Nagoya and Seto, to the Motegi Automotive Railway for a line between Nagasaki and Motegei. The Tamagawa Electric Railway has received permission to build a new section between Tamagawa-mura and Kinutamura.

The Yokohama Electric Car Company has applied for permission to extend the electric car line by a double track from Honmoku to the Yawatabasi terminus.

Stock Deliveries Can Be Made on Wood Ties

Demand Is Light as Railroads Are Concerned Over Existing Contracts at High Prices

About the middle of last summer it was stated in these columns that timber owners were loath to cut their trees for railroad ties when so much higher prices could be obtained for board lumber. At the same time labor was comparatively scarce in many tie camps because of the more attractive wages that could be earned at lumber mills. These conditions are now changed materially. The price of board lumber has undergone a considerable decline, while quotations for wood ties cut locally along rights of way remain unchanged. There has been some reduction in prices by large producers who stock and sell ties commercially, it is true, but this reduction is slight and applies where lowered water freight rates have reduced costs. More labor is now available than can be used, but wages, it is stated, have undergone very little reduction.

PRICE SHEETS KEEP DOWN DEMAND

One reason why prices of ties have not declined commensurate with drops in lumber, is because the price sheets issued by the large steam railroads, stating what prices they will pay for ties delivered along the right of way, in many cases cover long term contracts. This factor has aided in cutting down demand as consumers are not anxious to buy ties while quotations are thus artificially maintained.

The market on the whole is extremely quiet just now, but starting this spring producers expect to see a brisk return of buying. They are encouraged in this belief by the large potential need that is known to exist for ties on the part of both steam and electric lines. During the war and since the armistice, buying of wood ties in this country has fallen far below the normal quota that it is estimated must be purchased each year to keep roadbeds in good repair.

The price now in effect, which one of the large steam roads is paying for wood ties delivered along the track, quotes standard white oak ties at from $.95 to $1.85 each depending upon the grade, and chestnut ties from $.75 to $1.50 each. Southern yellow pine ties covering three grades delivered at New York are quoted by a large producer at from $1.10 to $1.65 each.

Deliveries at present are favorable as shipments from storage points in many cases can be made from stock; although the current surplus stocks are kept rather low. For this reason more than one producer is advising its regular customers not to wait until spring before placing orders, as demand coming all at once at that time may very possibly lengthen deliveries.

Lightning Arresters Drop Ten per Cent

Railways Are Not Entering the Market to Cover Spring Needs—Good Stocks and Prompt Deliveries

Price decreases of 10 per cent on railway lightning arresters have been announced by several of the large manufacturers, effective about the middle of this month.

As yet electric railways are not placing orders to cover their spring needs though one large manufacturer states that the volume of inquiries received indicates that they will do so before long. Other producers report an absence even of inquiries, and are not looking for buying to start until thunderstorms are actually a factor to be reckoned with. Good stocks have accumulated at the factories and deliveries can be made promptly at the present time.

Brill Profits Show Gain in 1920

Total Sales Also Surpass High Mark of 1918, When Company Operated Under Large War Contracts

For the year 1920 the sales value of the combined output of J. G. Brill Company's four plants amounts to $17,537,293, according to the annual report of the company just issued. This is a record figure, as it exceeds both the $14,210,622 total sales of 1919 and the previous high mark of $16,761,154, recorded in 1918, when the company was working under large government war contracts. Profits for the past year, after deducting the sum of $964,090 for depreciation, maintenance and repairs, were $1,415,321, from which must be further subtracted $240,000 to cover unassessed federal income and excess profits taxes, and $150,000 against any possible decrease in assets. This makes the net profit for the year $1,025,321, surpassing both $831,869 in 1919 and $916,509 in 1918. The inventory of all raw material on hand was priced at cost or at the prevailing market price at the end of the year, whichever was lower.

The value of unfilled orders on hand as of Feb. 1, 1921, is $3,670,310, which does not compare very favorably with $6,904,792 and $8,204,448 of unfilled orders on the same date in 1920 and 1919 respectively. In view of the present depressed condition of the market, however, this volume of business to start the year seems by no means unfavorable. In fact, regarding the outlook for the present year the tone of the report, which points out the present great necessity for street railway equipment, is optimistic.

Independent Steel Production on Low Basis

Recent Price Cuts of from $3 to $7 of Many Independent Mills Have Not Acted as Stimulus to Buying

With recent recessions in price of from $3 to $5 and even $7 per ton below the Industrial Board's schedule, made by most of the independent steel mills, there has resulted to date little stimulation to buying. Mills are operating at a very unsatisfactory capacity, down as low as 25 per cent being reported in several instances. The leading interest is reported as operating at about 80 per cent, but there is a feeling in the trade that this capacity will be even lower in the very near future.

In the independent field reductions in wages at mills and fabricating shops are becoming common, from 10 to 20 per cent lower pay being quite general. In many instances this has been done without reducing the hours of labor, while in other instances the working time has been cut sometimes to four days a week while keeping the rate of pay the same. The rate of pay at the mills of the corporation has not been changed and reports assert a holding to published prices.

Most of the price changes seem to affect the semi-finished steel products rather than finished products on which there is a relatively great amount of labor. Steel plates are being quoted on a 2.40-cent base, f.o.b. mill, 25 cents below Industrial Board prices. Structural shapes have declined about $4 a ton to a 2.25-cent base. Reductions have been reported up to $7 a ton on blue annealed sheets, while on the black sheets the drop has been about $3. Galvanized holds better.

Consumers are buying only as it is absolutely necessary. While the unstable conditions remain in the price market, there is a current of opinion that this buying will remain light. There is a tendency to expect a recession in price by the leading producer, in which event it is felt that the market will again come to a more stable level. But with operations on a 75 or 80 per cent level it is reasonable to expect a holding in price as long as production can be maintained probably within twenty points of these figures.

Price Cuts Announced on Electric Railway Material

In addition to the price drops on various apparatus announced by the General Electric Company in last week's issue, there have been other reductions by this company on material in the electric railway field. The reduction, which is dated Feb. 9, is approximately 10 per cent and includes railway motor gear cases, brushholders, carbon brushes, car-type circuit breakers, and car-type fuse boxes.

The Westinghouse Electric & Manufacturing Company, it is stated, has also made slight reductions in price on all the above material within the past two weeks with the exception of carbon brushes, but the specific date and amount are not available.

Rolling Stock

Cairo Electric & Traction Company, Cairo, Ill., states that it expects to purchase three single-truck cars.

Concord (N. H.) Electric Railways announces that it has purchased new H. L. control for six interurban cars.

Brockton & Plymouth Street Railway Company, Plymouth, Mass., reports that it expects to purchase eight fare boxes within the next few weeks.

The Hydro-Electric Power Commission of Ontario, Canada, it is learned, contemplates the purchase of new cars for the city of Windsor, Ont., Canada, and is interested in prices immediately. The estimated amount to be expended is placed at $25,000. A. McGill of Windsor is superintendent.

The City of Philadelphia, Pa., mentioned in the Jan. 8 issue as calling for bids on 100 steel passenger cars for the Frankford Elevated Railway, has awarded the contract to J. G. Brill Company. Only fifty cars are ordered at the present time, with the privilege of ordering as many as fifty more later. The motor control, couplers and draft gear and door operating mechanism will be covered by separate contracts and have not yet been awarded. The remainder of the equipment is as follows:

Number of cars ordered	50
Date, bids opened	Feb. 1, 1921
Delivery to be begun by July 1, 1921 and completed by Sept. 30, 1921	
Builder	J. G. Brill Company
Type	All-steel Motor Car
Seating capacity	52
Weight, total	65,000 lb.
Bolster centers, length	38 ft. 0 in.
Length over all	55 ft. 0 in.
Truck wheelbase	6 ft. 8 in.
Width over all	8 ft. 10 in.
Height, rail to top of roof	12 ft. 0 in.
Body	All-steel
Headlining	Agasote
Roof	Arch
Air brakes	Electro-pneumatic
Axles	Quenched and Tempered Carbon Steel
Bumpers	"Hedley"
Signal system	Bell with rope
Center and side bearings	"Stucki"—Side bearing
Couplers	Automatic Car, Air and Electric
Curtain fixtures	None
Curtain material	None
Door operating mechanism	Pneumatic
Gears and pinions	Gen. Elec.
Hand brakes	Brill
Heater equipment	Electric
Journal bearings	M. C. B. plain
Journal boxes	M. C. B. type
Motors, type and number	General Electric 259 inside hung
Seating material	Rattan
Trucks	Brill
Wheels	34 in. Wrought Solid Carbon Steel

Franchises

Hydro-Electric Power Commission, Ontario, Canada.—Since the Ontario Hydro-Electric Power Commission has refused to consent to a renewal for five years of the franchise of the Grand River Railway on Water Street, in Galt, Ont., the company has served notice that it will discontinue the freight service for manufacturers after March.

2. The City Council of Galt is endeavoring to have the Hydro Commission change its decision, as the loss of the freight service will be a serious blow to the city's industries.

Track and Roadway

Lafayette (Ind.) Service Company.—It is proposed to build a new curve to the tracks of the Lafayette Service Company in the southeast part of Lafayette and have the interurban cars of the Terre Haute, Indianapolis & Eastern Traction Company go down South Ninth and Kossuth Streets. Excavations for street improvements in East Main Street have resulted in the railway tracks being undermined and it is over these tracks that the cars of the Terre Haute, Indianapolis & Eastern Traction Company run.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Trenton & Mercer County Traction Corporation will expend $300,000 for maintenance and replacement during the coming year, according to President Rankin Johnson. The company will have 15,000 new ties placed, 300 tons of new rails, 300 poles and ten miles of new trolley wire. Considerable special work will be installed at West State and Prospect Streets.

Orleans-Kenner Traction Company, New Orleans, La.—Officials of the Orleans-Kenner Traction Company have been ordered to remove the spur track in the roadway of Rampart Street. Commissioner Maloney has informed the president of the company that the franchise for the use of the spur track expired two years ago.

Claremont Railway & Lighting Company, Claremont, N. H.—The Claremont Railway & Lighting Company expects to rebuild 1 mile of old track substituting A. S. C. E. 70-lb. rail with Weber joints for old 56-lb. rail with angle bars.

Oklahoma Union Railway, Tulsa, Okla.—The Oklahoma Union Railway, extending from Tulsa to Keifer, is planning to build an extension to Okmulgee as soon as financial conditions improve, according to I. F. Crow, of Tulsa, secretary and general manager of the line. The proposed extension will pass through Beggs and the Beggs oil district. It will be about 50 miles in length.

Texas Electric Railway, Dallas, Tex.—The Texas Electric Railway, which owns and operates the street car system in Waco, Tex., has installed a block signal system on one of its lines as a measure of safety in operation, and announces it will so equip other lines in the city. The block signal system has proved most effective in preventing accidents and making for absolute safety in operation.

Toronto, Ont. — The transportation commission of Toronto will ask the Ontario legislature for power to construct street railway extensions as local improvements and charge the cost to the properties benefited by such extensions. According to this plan adjacent townships would also be called upon to bear their share of the expenditure.

Citizens Railway, Clarksville, Tenn.—The Citizens Railway within the next month will extend its tracks a distance of 2 miles, and in this work 65 to 80 lb. rail will be used.

Burlington (Vt.) Traction Company.—The Burlington Traction Company expects to reconstruct 2 miles of its track in the early summer. Seventy-lb. rail has been ordered for May delivery.

Power Houses, Shops and Buildings

Cairo Electric & Traction Company, Cairo, Ill.—The Cairo Electric & Traction Company will purchase in the near future a motor generator set and rotary converter.

Claremont Railway & Lighting Company, Claremont, N. H. — The Claremont Railway & Lighting Company has purchased and is now installing two 300-kw. rotary transformers.

Charlottesville & Albermarle Railway, Charlottesville, Va. — The Charlottesville & Albermarle Railway within the next month will build an addition to its power plant for installing substation equipment and switchboards.

Concord (N. H.) Electric Railways.—The Concord Electric Railways has purchased new H. L. control for six interurban cars. Complete equipment has also been purchased for one 300-kw. motor generator set.

Brockton & Plymouth Street Railway, Plymouth, Mass.—The Brockton & Plymouth Street Railway will build a substation at Kingston and will purchase one 22,000-volt oil switch.

Evansville & Ohio Valley Railway, Evansville, Ind.—The Evansville & Ohio Valley Railway, has leased the building adjoining the one it now uses as a station at Rockport, Ind., and will remodel, enlarge and convert the building into a suitable station.

Trade Notes

The Alloy Metal Wire Company, 154 Nassau Street, New York City, has filed notice of increase in capital stock from $100,000 to $200,000.

The American Steel & Wire Company, Chicago, is planning to build a three-story addition to its plant in Worcester, to cost about $150,000.

The American Insulated Wire & Cable Company, Chicago, has recently purchased a one-story building at Twenty-second and Fisk Streets, containing 40,000 sq.ft., which will be remodeled and used as a copper-wire rod mill. New equipment to cost about $250,000 will be installed.

The Atlas Valve Company, 282 South Street, Newark, N. J., announces that the company has acquired by purchase from the Ideal Automatic Manufacturing Company the sole patents and rights to manufacture the Ideal automatic pump governor. This rounds out the company's line of valves, pump governors, regulators, etc.

The Cleveland Belting & Machinery Company, 1504-24 University Road, Cleveland, manufacturer of engines and boilers, generators, motors and belting, has enlarged its storage space by an addition 65 x 320 ft. The company says that its business is beginning to improve and expects it will continue to increase from now on.

The Jeffery-Dewitt Insulator Company, Huntington, W. Va., has just put into operation a new kiln which with its supporting accessories will double the insulator capacity of the plant. In addition, in order to have a continuous source of raw material and to be independent of the market for feldspar, the company has purchased its own feldspar mine.

The Acorn Insulated Wire Company, 73 Richards Street, Brooklyn, N. Y., has acquired the plant of the Davis Oil Company on Ninth Street, extending to the Gowanus Basin bulkhead, for a new plant for the manufacture of insulated wire and other products. The property is 146 ft. x 380 ft., improved with five-story buildings, and has been held at about $150,000.

The Black & Decker Manufacturing Company, Towson Heights, Baltimore, Md., announces the opening of a new branch office and service station at 75 Fremont Street, San Francisco. This office will have jurisdiction over the entire Pacific Coast territory and will be in charge of M. A. Johnson. At this address there will be a complete stock of parts carried and a factory-trained mechanic will be on hand.

New Advertising Literature

Metal.—"Monel Metal" is the title of a twenty-eight-page booklet published by the International Nickel Company, 43 Exchange Place, New York City.

Foundry Ladles.—The Whiting Corporation, Harvey, Ill., has issued catalog No. 156, superseding No. 147, covering its foundry ladles.

Electric Rivet-Heating Forge.—The United States Electric Company, New London, Conn., has issued bulletin No. 5, on its electric rivet-heating forge.

Transformers.—The Wagner Electric Manufacturing Company, St. Louis, Mo., has issued bulletin 124, covering its different types of transformers.

Cords and Fixtures.—The Inland Electric Company, 15 N. Franklin Street, Chicago, has issued a folder on Steelite armored portable extension fixtures.

Transformers.—The Esterline Company, Indianapolis, Ind., is distributing a four-page leaflet describing its new portable multi-range current transformers rated at from 25 amp. to 800 amp.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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Electrical Engineers Are Conservative Regarding Cable Rating

THE American Institute of Electrical Engineers took up a vital subject at the midwinter convention last week in New York, when careful consideration was given to the possibility of marking up the safe carrying capacity of electric power cables. The present Institute standard rule, which is of course the basis upon which cables are purchased, rates them upon an ultimate temperature of 85 deg. C. under steady load. This some engineers consider ultra-conservative, but the consensus of opinion at the New York meeting favored the 85-deg. rating, leaving to the owners of the cables the responsibility for results if the standard rating is exceeded. This can safely be done under some conditions and for certain periods, but the standard rule might well remain as it is for the present.

A question of a few degrees more or less may not seem very important to one not responsible for cable manufacture or operation. As a matter of fact, it is fundamentally important, on account of the nature of the materials which are involved. The discussion at New York related to paper cables, but of course the same general considerations apply with rubber-insulated cables. In cables, organic materials are necessarily depended upon for insulation, and such materials are extremely sensitive to the effects of high temperature. The changes which are produced are very subtle and, as inspection of the insulating material is possible only by destruction of the cable, a large factor of safety in loading must be allowed.

Entirely aside from the result of the conference of the Institute on the rating of cables, the information brought out will have great current and reference value to cable owners among electric railways. It will give a sense of security to all of those who have treated their cables with due consideration of their temperature-life characteristics.

The Motor Bus Advances Again

ANOTHER breach in the "greater capacity" fortress of the electric railway is threatened in the London General Omnibus Company's development of the fifty-four-seat motor bus, described elsewhere in this issue. It is true that the Chicago Motor Bus Company can claim priority in bringing out a bus of this capacity, but the London case is more significant in that the super-bus is to be used over narrow, congested, frequent-stop highways for the greater part of its runs, without Chicago's offset of long stretches through public parks. We are therefore to see whether the schedule speed of such a bus can equal the old-time thirty-four-seater, it being a question of a big bus with good passenger interchange facilities but more stops versus a small bus with one-aisle entrance and exit. It is true that the company has had in use for a year or so about two hundred Type K, forty-six-seaters, which also have the spacious platforms of the latest type, but the fifty-four-seater will prove a far harder test.

The significant fact as to efficient use of space is that within a length of 24 ft. 7 in. over all it is possible to carry fifty-four seats, whereas three years ago a length of 22 ft. 6½ in. was required for but thirty-four seats. Expressed in linear dimension of street space, the drop has been from 8 in. to 3.46 in. per seated passenger, and in terms of area (passengers into the product of maximum over all dimensions of width and length) from 4.68 sq.ft. to 3.22 sq.ft. per passenger. Next in importance is the matter of weight, for through the use of such metal as nickel steel for the body framing the weight per seated passenger has been cut from 237 lb. to 173.5 lb.

It is pleasant to add that the two large American double-deck bus operators are also well up in front in both capacity and weight developments. Thus the standard forty-seven-seat bus of the Fifth Avenue Coach Company weighs 190 to 200 lb. per seat, and the new sixty-seat double-deck bus of the Chicago Motor Bus Company was figured to weigh but 209 lb. per seat, despite the inclosure of the top deck. These attainments give rise to the hope that future single-deck buses, which will probably be the most common in the United States, will also embody the use of high-strength materials, for low weight is an urgent necessity in view of the high cost of gasoline.

California's Help Sought in New York Traction Affairs

THE transit situation in New York City and New York State has received a national aspect by the appointment of Senator Hiram W. Johnson of California as special traffic counsel for New York City in opposition to the Miller plan. If Senator Johnson, who has a large popular following in his state, will bring constructive ideas to the New York City problem, his advent is to be welcomed. Criticisms have been directed against his appointment because he comes from far away, but this, of itself, ought not to debar him.

Incidentally, Senator Johnson, while Governor of California, is credited with having been largely responsible for the passage of the California public utilities act in 1911, by which the commission was changed from an elective commission to one appointed by the Governor. By this act the jurisdiction of the commission was extended to include rates, service, finances, facilities and extension of the State's public utilities. In its report for the year ended June 30, 1920, just issued, the California Commission has this to say among other things in regard to the railways within its jurisdiction:

> The interurban and street railways have suffered more, perhaps, than any other class of utilities from the conditions brought about by steadily rising costs during the last few years. With street railway fares fixed at 5 cents, by custom and by franchises, the shrinking value of the dollar threatened disastrous consequences for practically all street railways. And yet it is apparent that, in spite of the more

> severe competition of motor vehicles, the time is by no means here when our cities and rural territories can dispense with electric railway facilities. . . .
>
> The commission has not hesitated to extend to the electric railway systems of the state such relief, by increase of fares or by establishment of the zone system, or by ordering radical operating economies, as would insure a continuation of reasonably good service.
>
> The commission has also taken opportunity to call attention to its belief that the relationship between street railways and the communities they serve should be radically changed and that a modification of obsolete franchise requirements would distinctly be in the interest of the public. . . . The change from unsatisfactory and obsolete term franchises to better indeterminate franchises is now being effected in several communities and is being given careful consideration in others. The commission, under the public utilities act, is called upon to take a part in the creation of better franchise conditions and several proceedings of this nature are now pending.

This plan for California does not seem to differ very greatly from that which Governor Miller proposes for New York City.

The Bus as a Tax Reducer

IT'S all very well to appeal to the other fellow's sense of justice, but there are times when a more convincing argument is needed. A good example of this is the time-disgraced practice of making the car rider pay for the bridges and the street paving used, while no payment other than a nominal license charge is required by every class of private business and pleasure vehicle. The arguments of the railway company as to the unfairness of these charges are generally admitted, but the taxes continue just the same because the temptation to pluck a victim who can't get away is too great to be resisted.

Conditions have changed now, however, and today there are many places where the victim can get away from these extortionate contributions by threatening to substitute a motor-bus service for the trackway. At once the community will become alarmed at the prospect of having its ever-on-the-job transportation service replaced by something that can be withdrawn instanter to more lucrative fields. It will begin to inquire more deeply into the matter and, rather than sacrifice so tangible and comfortable a service as that on rails, seek to retain it by offering to remit the objectionable and unreasonable imposts of the past.

Such a plan is practicable, of course, only when the cost of bus operation per seat is no more than that of car operation plus the paving or bridge charge, but this is often the case on lines of light traffic, and where the line is a poorly paying one or is not paying at all the change is better than to discontinue service altogether. Moreover, the effect on the community of such a change ought to be most salutary. Having admitted the injustice of such a charge where payment can be avoided, the authorities cannot well continue to impose it on routes which are bound to remain trackways.

Of course, it does not follow that the bus will not have to pay for the use of the highway, but as, unlike the car, it does not differ essentially from other vehicles, it is not conceivable that it will ever be singled out for such disproportionate burdens as has been the case since the first legislative Solon wrote that awful clause: "And the tramway shall be responsible for the installation and maintenance of the paving between the rails and for 18 in. on each side thereof," not to mention curb-to-curb paving, street sprinkling or other taxes once so cheerfully drawn out of the street railway's cornucopia!

More Science and Less Law

AN ENGINEER on a hard-pressed electric railway property recently expressed his disappointment at the expenditure by his company of a large sum of money for counsel to fight a certain measure demanded by the authorities and thought unreasonable by the company. "From an engineering standpoint," he said, "the change would have little value, but it could have been made for but little if any more than the sum expended for legal charges to find a way not to comply." The remark offers food for thought. Many public demands are incapable of fulfillment except at prohibitive cost, but there are others nearer the border line of reasonableness and practicability as regards expense where a straining to do what the public wants would be good policy.

Selling Energy to the Farmers

PEDDLING electric service to the farmers seems at first glance to be a little out of place for a company which is supposed to make its bread and butter by transporting commodities of a little more tangible character than electric energy. The old proverb that one who is "a jack of all trades is master of none" is probably quite as true today as it was when the world was a little younger. Nevertheless, many electric railways do other things than sell and deliver transportation service, and in the great interurban country of the Middle West selling electric energy is one of these.

To the old timers in the industry the problem is not a new one. The interurban railways were the pioneer builders of cross-country power lines, and in the very beginning and at intermittent intervals ever since they have been pestered by well-meaning farmers and small-town officials who have desired electric service. These people in their excusable ignorance did not know, and for that matter do not now know, that electric service, like a mule, may have various standards of quality and character and that the particular brand of these useful characteristics afforded by a 600-volt trolley circuit is not well adapted to domestic entanglements. In some instances kindly disposed officials permitted connections to the trolley circuit or to substation buses. The general practice, however, has been either to wholesale energy from the transmission line or do both a wholesale and a retail business through the medium of a subsidiary company.

The recent widespread demand on the part of farmers and residents of outlying villages for electric service seems to be bringing in a whole crop of disturbing questions. Among these may be mentioned the problems of ownership of lines, construction details, financing, methods of operation and maintenance, damage liability and rates. The subject of rates is likely to receive sufficient attention because of its obviousness, but the problems of construction and operating and maintenance methods may be quite as important to the railway from the standpoint of its main business. Rural distribution lines erected, operated and maintained by farmers' mutual associations or stock corporations are likely to prove a distinct menace to the continuity of railway power supply when connected to railway transmission lines unless the railways take an active interest in seeing that these lines are properly built and maintained. And then there is the matter of damage liability. Unless responsibility for this liability is properly fixed, a single accident may cause the railway the loss of valuable good will as well as a monetary loss which the sale of energy for a good many years would not cover. With these problems properly solved, however, the rural power field seems to have large future possibilities. Certainly it is worthy of careful consideration by those electric railways which are now carrying on an electricity supply business.

Why Not "An American Committee on Electrification"?

SO MANY organizations are becoming interested in the subject of electrification of steam railroads that already there is much duplication of effort in gathering, digesting and presenting information in this highly important field. Electrification affects so many interests that it is perfectly proper for the national societies representing these interests to study it from their several points of view. They ought, however, to co-operate in some way so that the results of their work will be cumulative rather than repetitive.

The necessity for co-operation has been for some time in the minds of the men who are active on heavy traction committees in a number of associations. So far they have not been able to do much, except by an attempt at interlocking committee memberships. This prevents duplication somewhat, but its effectiveness is not to be compared with that which could be secured through the functioning of a joint committee, composed possibly of the chairmen of all heavy traction committees in the national societies. This committee could shoulder such duties as the compilation of general electrification data, and it could parcel out among the affiliated special committees the lines of work in which they severally are most interested and can most effectively carry out. There are successful precedents for such a committee in the American Committee on Electrolysis and the American Engineering Standards Committee, not to mention the numerous other joint committees which have less comprehensive scope.

In this connection it is highly important for each organization that is interested in electrification to realize just why it is so interested, and to define the subdivision of the field to which it will devote attention. A joint committee would help in this task. It is easy to see, for example, that the American Railway Association is concerned in this whole matter from the transportation standpoint, while its mechanical section is interested in the maintenance of the electrical equipment and in the design of the electrical rolling-stock. The American Railway Engineering Association looks less at the details of construction of electric locomotives and cars but more at the broader engineering aspects of the problems involved. Then comes the American Electric Railway Engineering Association, which offers the railroads the benefit of the experience of many electric railways with moderately heavy electric locomotives and heavy multiple-unit cars. These and other railway associations are close to the job and are vitally concerned with the success of electrification. There are other groups of associations which are manifesting a lively interest in it also, and the reason is not far to seek.

Take first the engineering associations of a general nature, like the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the Franklin Institute, etc. To them a change in motive power on the steam roads opens up new and attractive possibilities for applying the principles of engineering science and for standardizing practice as it develops. Then there are the other organizations, like the National Electric Light Association, representing the power industries, which look to the railroads as an enormous field for new business. They naturally want to keep in touch with electrification progress.

All of this simply goes to prove how obvious is the necessity for some kind of clearing house for electrification information. This year there will be some duplication of work and waste of energy; next year there will be more, unless a determined effort is made to prevent it.

Service at Cost Not the Same as Cost Plus

IN SOME communities an opposition to service at cost has arisen under the mistaken notion that in principle it is very much like the cost-plus plan of contracting. This latter plan was subject to so much abuse during the war that it is under somewhat of a cloud, and in certain respects deservedly so. Under the cost-plus plan the profits of the contractor increase with the cost of the undertaking, and consequently he is under the temptation to pad the expenses and increase the cost.

The service-at-cost plan of railway operation is not open to this temptation. No matter how expensive or extensive the service, the recompense of the contractor does not increase. With the incentive form of service at cost the recompense actually diminishes with inefficient operation. With straight service at cost the operating company is on what corresponds to a salary basis, all expenses being under supervision of the city, but in no case do the profits increase with the expenses. In fact, in straight service at cost there are no profits, the arrangement being one of hiring at a fixed rate the equipment and working organization of the railway company. Perhaps it is the novelty of this idea of no profit which makes service at cost difficult for the ordinary business man to understand. It is different. Its nearest parallel, of course, is a city department which is self-supporting, like a department of docks or a water department. In fact, the only notable difference is that private management and capital are substituted for public, to the benefit of the community.

Quotation from the Federal Electric Railways Commission Report

No. 9

WHILE eventually it might become expedient for the public to own and operate electric railways, there is nothing in the experience thus far obtained in this country that will justify the assertion that it will result in better or cheaper service than privately operated utilities could afford if properly regulated.

Public ownership and operation of local transportation systems, whether or not it be considered ultimately desirable, is now, because of constitutional and statutory prohibitions of our local governments, and the state of public opinion, practicable in so few instances that private ownership and operation must as a general rule be continued for an extended period.

Commission Studies Newark Traffic

The Engineers of the Board of Public Utility Commissioners of New Jersey Make Thorough Analysis of Street Railway Operation on Broad and Market Streets and Suggest Plans for Extensions and Rerouting—Speed of Cars Found to Be Very Low on Main Thoroughfares

THE traffic inspectors of the New Jersey Board of Public Utility Commissioners have recently completed a comprehensive study of street car traffic on Broad and Market Streets, Newark, and have made suggestions in ways of handling the rush-hour peak traffic. Two of the main streets of Newark are Broad and Market, which cross at right angles approximately in the center of the densest traffic territory, and the present routing of the majority of the cars is on these streets through the center of the city. The traffic situation is further complicated by the extreme number of vehicles which must also use the same arteries followed by the street cars. Congestion and slow movement are perhaps more noticeable on Market Street, and are particularly acute from 4:30 to 6:30 p.m.

The Public Service Railway, to provide for the then steady increase in traffic, built an elaborate terminal in 1915 on Park Place and constructed loops through it so as to reduce the congestion at Broad and Market Streets and Broad and Central Avenue. This, however, was accomplished at the expense of greater congestion at Market and Mulberry Streets.

In 1915 the population of Essex County, of which Newark is a part, was 566,324, while in 1920 it was 652,000, an increase in five years of 86,000, or 15.2 per cent. During this time the Public Service Railway, unfortunately, has not opened up any new routes of importance with the exception of the Port Newark extension, and it has therefore been necessary to care for the increase in traffic during rush hours by the addition of extra service over the established routes. During the war the company adopted the skip-stop plan and thereby increased the available car mileage of existing equipment. This improved the service to some extent even though the company was unable to secure the needed additional equipment properly to care for the increased demands of traffic.

In December, 1917, as the result of a previous investigation of the then existing congestion, the commission's traffic engineers recommended staggered closing hours for department stores and other commercial establishments to spread out the rush-hour traffic. Co-operation with this plan was followed to some extent and for a while resulted in an improvement of the car service. It has not been possible, though, to get the department stores to change their hours of employment so they would not coincide with the general closing hour of other commercial establishments throughout the city. The moving picture theater at present is believed to have much to do with traffic congestion, for the shoppers after making their store purchases often spend considerable time in these places of amusement and are not ready to go home until the rush-hour traffic is really at its peak.

During October and November, 1920, a study was made of the car density on Broad and Market Streets. It was found about 50,000 persons left that city center on street cars during the evening rush hours. To help care for this traffic the company has purchased additional trailers and intends soon to operate them on lines extending through the center of Newark. The operation of these trains, it is said, will result in even greater car density on Broad and Market Streets than at present and will tend further to slow up traffic.

The car density north on Broad Street during the evening rush is shown in the diagram. This shows that the "neck of the bottle" on Broad Street is between Central Avenue and Bridge Street, including the intersection at Central Avenue and Broad Street. The greatest number of car movements in all directions during the two-hour rush at Broad Street and Central Avenue is 525, equivalent to a car every thirteen seconds, which is merely the time required for a car to pass over the intersecting track, for the average headway on the northbound track was thirty seconds, while southbound it was thirty-two seconds. The east and west bound cars at this intersection are those of the Central Avenue line, which operate on an average headway of 3.6 minutes in each direction.

A count made on Oct. 25, 1920, between 4:30 and 6:30 p.m. showed that 242 northbound cars passed the observation point on Broad Street between Central Avenue and Bridge Street. The greatest car density was between 5 and 6 p.m., when a car almost invariably passed every twenty-four seconds, although in some instances there were two cars within the twenty-four-second period. At other times the headway was irregular. Inquiry as to the cause showed this to be due to the time required for loading the cars. Inasmuch as the operators were unable to make up the time lost on the return trip the delays became greater because of the increased car density on Broad Street. As a result of the cars being off schedule the first car appearing would usually be overcrowded.

It also developed that when a car became six or seven minutes late during the evening rush hours it was almost impossible to get it back on schedule before the theater traffic commenced. If the lost time was made up it was by turning back cars before they completed their prescribed route, though this resulted in a portion of the route being without its full quota of service.

On Broad Street the scheduled running time for the cars between Clinton and Bloomfield Avenues, a distance of 1.89 miles, during the evening rush hours is sixteen minutes. The calculated schedule speed per trip is therefore 7.1 m.p.h. Actual observations showed, however, that it was impossible for the car operators to meet this schedule and that, instead, the cars actually developed a speed of but 5 m.p.h., far too low for satisfactory street railway transportation. This meant twenty to twenty-three minutes to make a sixteen-minute run, with the consequent lengthening of headway and unnecessary overcrowding.

As a result of these studies the commission's inspectors concluded that the point of saturation of car flow has been reached at Broad and Market Streets, at Broad

Street and Clinton Avenue and at Broad Street and Central Avenue, and that in order to relieve this condition it is necessary to establish new routes on parallel streets within the central zone.

PLANS FOR RELIEVING TRAFFIC ON BROAD STREET

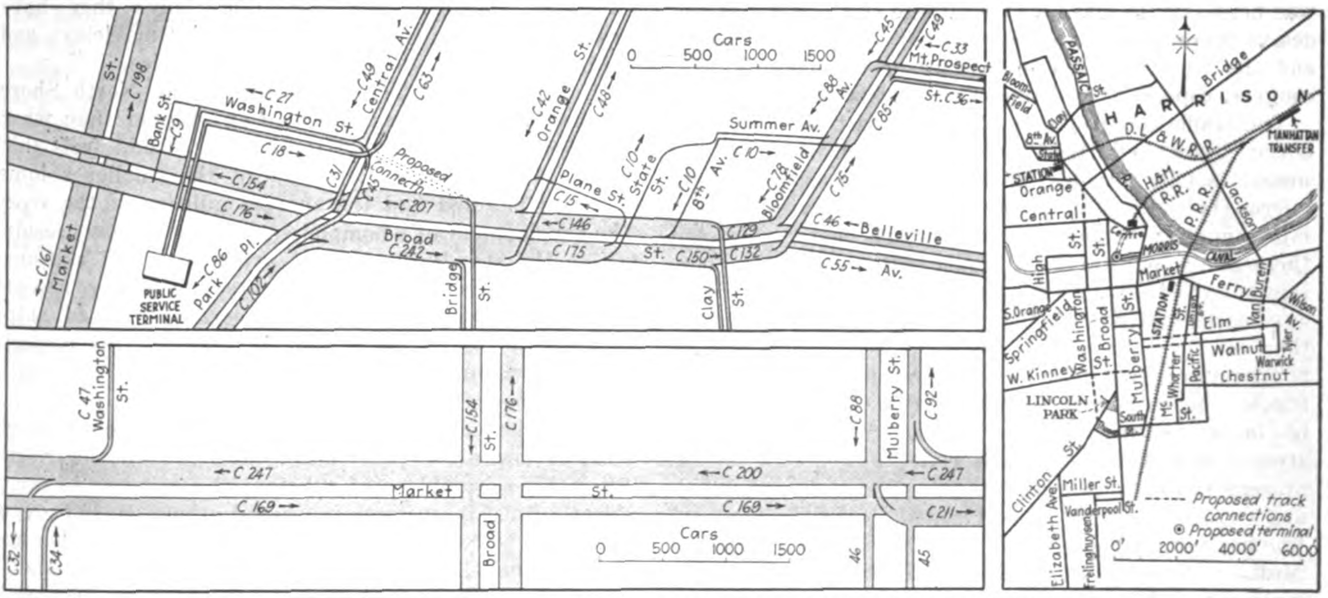
It is suggested that the Hudson & Manhattan station be relocated as an underground station in Military Park opposite the present Public Service Terminal, as was contemplated in 1910 (see map). This would eliminate the existing traffic interchange at the Park Place station, and the rerouting of the surface cars would be made less difficult if a double-track extension was built on Washington Street from Central Avenue north to Broad and from Kinney Street south to Clinton Avenue.

It is also suggested that the city stand the expense of eliminating the offset now existing in Washington Street where it crosses Market Street so that an additional route can be operated from Broad Street to Clinton Avenue via Washington. As the situation now exists this route is impracticable, due to the offset in the street and the heavy traffic on Market Street that would have to be crossed.

Many of the attempts at improvement of the traffic conditions in Newark have been based upon the assumption that the great majority of travelers had as their ultimate destination the intersection of Market and Broad Streets. This assumption is so far from the facts that remedies based upon it have, in a number of instances, served still further to embarrass a large portion of the traveling public. It is quite true that many persons have as their destination some point in close proximity to Market and Broad Streets, but there are also other extremely important destination points. First, the Pennsylvania Railroad Station on Market Street, although not of the importance it once was, cannot longer be ignored in plans for handling traffic; second, Central Railroad Station on Broad Street; third, Park Place Station of Hudson & Manhattan Railroad; fourth, Lackawanna Station on upper Broad Street.

Any study will show that factories are located in all parts of Newark, many of them at very considerable distances from the center of the city. The majority of the commuters to the business part of the city have as their destination various points in an area extending from the Lackawanna Station on the north to Clinton Avenue on the south and from the Courthouse on the west to the Pennsylvania Railroad Station on the east.

At present it is a fairly easy matter to obtain transportation from almost any point in and around Newark to the intersection of Market and Broad or to the Public Service Railway Terminal, but to go from the extreme northern end or the extreme southern end of the city to the Pennsylvania Railroad Station is not at all easy. It is equally difficult to reach the eastern and western parts of the city from the Lackawanna Depot on north Broad Street or the City Hall on south Broad Street. In street railway transportation greatest efficiency obtains only when through routes can be operated. Through routing, however, is only feasible when a sufficient number of persons are traveling with a fair degree of regularity over a substantial portion of the particular routes.


Cars
0 500 1000 1500
Market St.
C 198
C 161
Bank St.
C 9
C 27
Washington St.
C 49
Central Av.
C 63
C 18
C 154
C 176
C 31
C 45
Proposed Connecth
C 207
Broad
C 242
PUBLIC SERVICE TERMINAL
C 86
Park Pl.
C 102
Bridge St.
C 42
Orange St.
C 48
Plane St.
C 15
C 146
C 175
C 10
State St.
8th Av.
C 10
Summer Av.
C 78
Bloomfield
C 88
Av.
C 85
C 45
C 49
C 33
Mt. Prospect St. C 36
C 75
C 129
C 132
C 150
C 46
Belleville
C 55
Av.
Clay St.
C 47 Washington St.
C 154
St.
C 176
C 247
C 169
Market St.
C 200
C 168
Broad
C 88
Mulberry St.
C 92
C 247
C 211
C 32
C 34
46
45
Cars
0 500 1000 1500
PASSAIC R.
HARRISON
Bridge
St.
Bloomfield
Clay
8th Av.
State
STATION
D.L.&W.R.R.
H.&M. R.R.
P.R.R.
MANHATTAN TRANSFER
Jackson
Orange
Central
Centre
MORRIS CANAL
High
St.
St.
Market
Ferry
Van Buren
Wilson Av.
S. Orange
Springfield
Washington
Broad
St.
St.
STATION
Union St.
Elm
Walnut
Tyler
Warwick
Chestnut
W. Kinney
St.
Mulberry
McWhorter St.
Pacific St.
LINCOLN PARK
South St.
St.
Clinton
Miller St.
Elizabeth Ave.
Vanderpool St.
Frelinghuysen
Proposed track connections
Proposed terminal
0' 2000' 4000' 6000'

DIAGRAMS SHOWING CAR FLOW ALONG MARKET AND BROAD STREETS, NEWARK, N. J.

At top, car flow diagram, Broad Street (Newark) between Market Street and Bloomfield Avenue during evening rush hour on Sept. 17, 1920. At right, existing and proposed trolley routes in center of Newark, N. J. At bottom, car flow diagram, Market Street (Newark) between Mulberry Street and Washington Street during evening rush hour.

It is suggested that a loop be built around Lincoln Park. The Public Service Railway Company could then reroute its Broad and Mount Prospect lines so that the northern portions of these lines would terminate at the proposed Lincoln Park loop, while the southern portions could terminate at the existing Lackawanna loop.

It is believed that with the rerouting proposed, the speed of the cars on Broad Street, particularly during the periods of congested traffic, would be materially increased, thereby greatly improving the service and resulting undoubtedly in greater satisfaction on the part of the traveling public. It is believed also that the extensions would doubtless provide for the normal increase in traffic for a considerable number of years.

MARKET STREET CONDITIONS

A similar study was made of the car flow on Market Street as illustrated above. This diagram indicates graphically the number of trolley cars operating past certain intersections. The junction of Market and Mulberry Streets is the heaviest intersection. Here 638 cars pass in the two-hour rush period, equivalent to one car every 11.3 seconds. This is due to the large number of cars routed to the terminal via Mulberry Street in addition to the regular service on that street. Other important junctions on Market Street are at Springfield Avenue and High Street, where there was a total of 325 cars for the rush period of two hours, and also at Market Street and Springfield Avenue, where there were 306 cars.

On Market Street the scheduled running time between the Pennsylvania Railroad and High Street during the rush hours is nine minutes. The distance between these points is approximately 0.86 mile and the speed per trip would thus be approximately 5.7 m.p.h. Between 5:30 and 6:30 p.m. it was impossible for the operators on the majority of the westbound cars to make this scheduled running time, for the cars only developed an average speed of approximately 3.98 m.p.h., or, in other words, thirteen minutes was necessary to make a nine-minute run. Many of the delays were due to the car density on Market Street and the time required in loading or discharging passengers, especially at Broad and Market Streets.

The traffic conditions on Market Street between Mulberry Street and the Pennsylvania Railroad loop are unsatisfactory because Market Street is comparatively narrow between these points. It was observed that the large number of motor vehicles which operate between these points on Market Street greatly retard the operation of the trolley cars. This condition is also dangerous to the patrons of the company desiring to board the cars.

To relieve the excessive car flow density on Market Street the report recommends that immediate steps be taken to establish new traffic routes on parallel streets, following the same general direction as the present route on Market Street. The proposed routes are shown on the map and consist of a double-track line on West Kinney Street from Washington Street to Mulberry Street, with single track east on Walnut Street and west on Elm Street, as these two streets are not of sufficient width to permit the laying of double tracks thereon.

Standardizing Practices in Handling Merchandise Traffic

North Shore Line Has Developed Book of Rules for Agents, Conductors and Other Employees Who Handle l.c.l. Matter—Would Be of Assistance to Other Electric Railway Lines

NEARLY every electric railway management that has started in the business of handling package freight will agree with the sentiment expressed by Britton I. Budd, president Chicago, North Shore & Milwaukee Railroad, that this step involves a lot of hard work and "grief." To go through the process of building up an organization, getting equipment and facilities and working out a system for handling the business expeditiously and without excessive losses is obviously no small task. Then an almost worse problem is that of expanding the organization, facilities and system designed for a $3,000 or $4,000 a month business to handle a $40,000 a month business, particularly when the rate of expansion is well-nigh overwhelming. A certain amount of unsatisfactory service is bound to develop under such conditions.

But appreciating the futility of the work of the man who goes out to sell the service of the railway and succeeds in securing new customers only to have his company fall down in "delivering the goods," Mr. Budd has had a thorough study made by an expert from the steam railway field in an effort to make the service actually rendered live up to the intentions of the company as near 100 per cent as possible. This traffic expert first directed his attention to an analysis of the complaints and correction of the causes for them. This gave him a line on many of the weaknesses in the methods employed and in the organization functioning. He then made a thorough property-wide study of the system of handling this merchandise dispatch business and as a result proceeded to standardize all routine as far as possible. It was found that 90 per cent of the duties of the merchandise dispatch employees could be laid down in a set of rules, leaving but 10 per cent of the total routine to be covered by special orders. These rules have been printed and distributed to the employees involved, and Mr. Budd says they have already had a noticeable effect in reducing delays and claims and, hence, in improving the service.

While the percentage of claims on the North Shore line in this service has not been any higher than what is common in steam road service, Mr. Budd feels that it should be much less in view of the smaller volume of traffic handled and the shorter mileage of the road. The development of a complete set of regulations, resulting in the standardization of practices at all stations, and making inexcusable any incomplete billing, acceptance of improperly packed or poorly consigned shipments, etc., should be a material help in this respect. The printed rules will also materially simplify the task of breaking in new men in the service.

It is believed that a study of this book, though developed to cover the particular conditions on the North Shore lines, would be of substantial assistance to other electric lines in systematizing and otherwise improving their l.c.l. service. A copy of this book of "Rules and Regulations Governing the Handling of Merchandise Traffic," which is printed in loose-leaf form to permit ready correction and enlargement, would no doubt be furnished upon request to Mr. Budd. It was the desire of the editors of the ELECTRIC RAILWAY JOURNAL to reprint this rule book, but space limitations make this impractical, and as the subject matter does not lend itself to abstracting the above plan of calling attention to the work done by the North Shore line seems to be the only feasible way to bring it to the attention of other electric railway men. An idea of the contents can be gained from a list of the first few of the 104 headings under which the subject matter is at present grouped: Merchandise received subject to tariffs; marking merchandise; time, not guaranteed; address of consignee; packing; method of loading; contaminating merchandise; separate local and through merchandise; overloading cars; ordering cars; waybilling merchandise, etc.

According to the annual report of the Department of Public Works, Chicago, 70,078 cu.yd. of snow were removed during the year 1919 from 13,588,196 sq.yd. of streets in the first ward downtown district of Chicago at a cost of $54,052,092, or 77 cents per cubic yard. Also 51,588 cu.yd. were removed from 7,943,892 sq.yd. of main thoroughfares in other parts of the city at a cost of $34,353, or 66 cents per cubic yard.

Insurance Rates Reduced 38 per Cent

Putting House in Order Permits East St. Louis & Suburban Railway to Increase Protection 95 per Cent, with But 16.6 per Cent Increase in the Cost—Keen Competition Inspired Among the Several Departments of the Company as a Result of Monthly Reports

THE East St. Louis & Suburban Railway has found it a very profitable undertaking to co-operate wholeheartedly with the Electrical Inspection Bureau in carrying out the recommendations of the latter's inspectors. These men make it a part of their regular work, if any interest is shown, to report to the insured on the condition of the property from the standpoint of fire risk and to make recommendations as to improvements which, if made, will bring a reduction of so many cents per hundred dollars in the rate charged for protection. This work of the inspection bureau is done on the theory that the insurance companies would rather carry a good risk at a low rate than a bad risk at a high rate.

Getting into the spirit of the work of the Electrical Inspection Bureau, President W. H. Sawyer of the railway set out during 1920 to place the various properties of the company in order in the way that the inspectors wanted it, but restricting the activities of the first year to only those improvements which it could be shown would pay for themselves in two years, through reduced insurance. Carrying out this plan, an expenditure for the entire East St. Louis & Suburban property of approximately $9,000 was made, with a resulting annual saving in the cost of insurance of more than $4,000. That is, in 1919, before the clean-up campaign was started, the rate which the company had to pay was 62.88 cents, while the rate on the 1920 contract is 39.2 cents. Actually, however, the saving made was turned into increased protection.

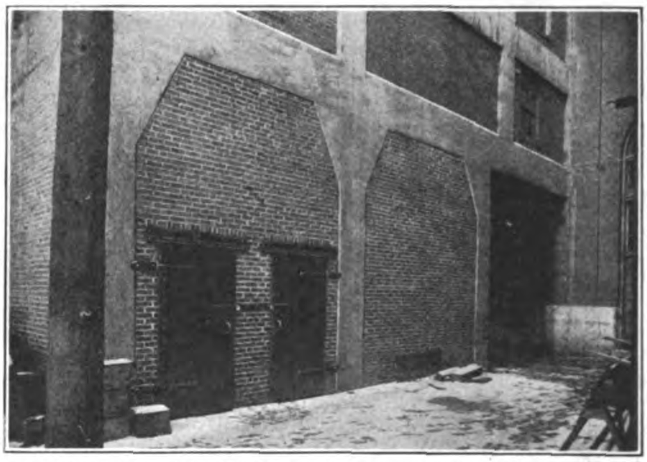
In 1919 the total insurance carried was approximately $900,000 and the annual cost $5,895. This was increased in 1920 to approximately $1,756,000, for which the cost was $6,875, or an increase of $980—16.6 per cent in cost for a 95 per cent increase in insurance. The additional insurance was placed largely on substations and the principal power house, which had previously been carried as fireproof buildings without insurance, but two fires therein had rather conclusively determined that protection was needed.

SOME OF THE DETAIL IMPROVEMENTS MADE

Some of the improvements made at the Winstanley Power House in East St. Louis will serve to indicate what was done over the property generally to accomplish the results noted above. A new fire alarm box was installed close to the power station at a cost of $224.77 to produce an annual saving in the cost of insurance of $101.80. Two additional stand pipes were installed in the power house at a cost of $296.18, with a saving of $254.50. Two additional watchmen's clock stations were installed at a cost of $98 to produce an annual saving of $120. All wooden lockers for workmen scattered through the power station were replaced with steel lockers arranged in two or three groups and equipped with slanting tops to prevent the storage of any articles on top. This change was made at a cost of $201.96 and it resulted in an annual saving of $101.80.

Previously, new and junk materials were stored in lockers and cubbyholes and miscellaneous places in the basement, in addition to five main store places in the basement. All of these materials and supplies were taken from the basement and placed in a non-combustible general storeroom provided by bricking in the space underneath the high-tension switching room, which is supported on concrete pillars, as shown in an accompanying picture. Furthermore, the miscellaneous cubbyholes in the basement were bricked in so that they could not be accumulation places for future junk and rubbish. The total cost for this piece of work was $780 and it produced an annual saving of $305.

One of the biggest savings was made by the installation of Bowser oil pumps and tanks in the main turbine room to replace the old system of simply placing the barrels on their sides and drawing off the oil as needed. The tanks were installed at a cost of $1,190 and they resulted in an annual saving on the insurance cost of $763.50. In addition, there will accrue the saving of about one-half gallon of oil per barrel, which cannot be drained from a barrel, but is withdrawn by the oil pumps, according to the station engineer.

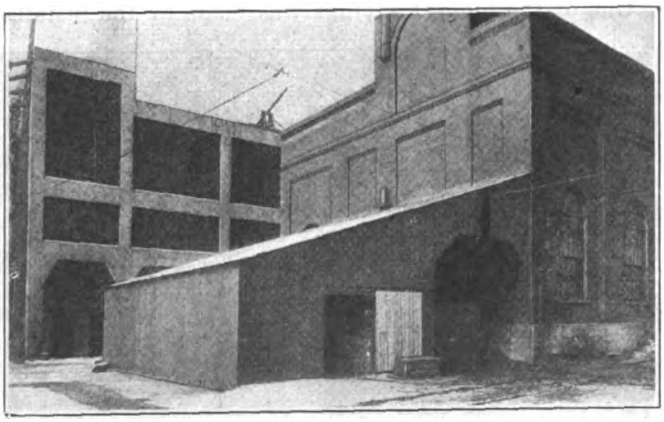

FIREPROOF STOREROOM AT WINSTANLEY POWER HOUSE PROVIDED BY BRICKING IN THE SPACE UNDERNEATH THE HIGH-TENSION SWITCHING ROOM

A steel shed for protecting workmen from the weather while unloading coal was built to replace a wooden shed. As this was a piece of work which had to be done regardless of the bearing on insurance, and as the new steel shed was extended to provide a storeroom for the boiler room supplies, which did not exist with the wooden structure, the cost of this item was not charged to the insurance clean-up plan. However, it produced a saving in insurance of $101.80 annually. This shed is shown in one of the accompanying pictures.

Other miscellaneous improvements at the power house included the placing of all conductors and resistors on metal instead of wood supports, resulting in a saving of $509; the replacement of all wooden stairs with concrete, built solid to prevent accumulation of material underneath and producing a saving of $245; the removal of work benches from the turbine room to a special room fitted up for a mechanic's shop at a saving of $50.90 per year; the installation of more steel waste cans; the replacement of wooden scrap bins with concrete bins, the purchase of more fire extinguishers, etc.

In addition to these physical improvements, the program has included a general campaign among the workmen to induce them to keep their work places clean and free from any accumulation of rags or rubbish. Each man endeavors to leave his work place in the best of condition every night. This work of appealing to the men to keep things clean and safe has been very successful because it has been possible to show them where this care results in actual money saving to the company, through reduction in insurance rates. Mr. Sawyer believes that the men do better work and that they have more self-respect if their place of employment is kept in an orderly manner.

A rather keen competition between different departments of the company in this matter of orderliness has been inspired as the result of the monthly reports made by H. J. Hodson, who has charge of the safety work of the company and of this insurance campaign. After his monthly inspection tour, which is made at the most unexpected times, Mr. Hodson writes a report in which all of the properties are classified into three divisions under these headings: "In a clean and orderly condition," "In a fairly clean condition" and "In a dirty and disorderly condition." When a department is listed under the second or third heading, it is accompanied by a few brief remarks giving the nature of the condition which has brought this classification. After these reports are written, they are submitted to Mr. Sawyer and then posted simultaneously on every bulletin board and sent to every department head. The result of this monthly report has been to promote great effort and care among the workmen to keep their department in the first group. For this reason, any one displaying slovenly work is usually "called" by his fellow employees.



STEEL SHED BUILT TO REPLACE WOODEN PROTECTION FOR COAL UNLOADERS, AND EXTENDED TO PROVIDE STORAGE FOR BOILER ROOM SUPPLIES

Because of his frequent visits over the entire property and his close contact with the employees in all branches of the company's service Mr. Hodson has been very helpful to Mr. Sawyer in providing a close contact between the management and the employees. Mr. Hodson has often been able to bring to the attention of Mr. Sawyer cases of employees in personal difficulties, wherein a little timely help on the part of the company could be given with a very worth-while effect.

Rebuilt Cars Relieve Shortage

Winnipeg Electric Railway Has Replaced Rolling Stock Lost by Fire Last April with Cars Reconstructed from Second-Hand Bodies Purchased from the Twin City Rapid Transit Company

THE Winnipeg (Man.) Electric Railway has just placed in service twenty remodeled low-floor cars. These embody most of the latest features of rolling stock for city service and replace those lost in the fire at the company's Main Street carhouse on April 7, 1920. Following the destruction of the cars in the fire bids for new cars were asked for, but immediate delivery could not be promised. It was imperative that the amount of rolling stock be increased in order to take care of the winter rush and so the company purchased twenty passenger car bodies without trucks or motors from the Twin City Rapid Transit Company of Minneapolis, Minn., in July last and has rehabilitated them in its own shops.

DETAILS OF THE REMODELING

In the process of reconstruction the cars were first stripped of their rear vestibules, interior fittings and front and rear bulkheads, all to be replaced by the features which make up the company's standard, single-end, double-track, pay-as-you-enter, low-floor car with front and rear exit and rear entrance. In order to incorporate these features in the reconstructed cars it was found necessary to lengthen the rear vestibule 30 in. This was accomplished by placing on each side of the car one ½-in. x 5-in. x 5-in. angle-iron vestibule knee extending back 8¾ in. from outside the car body, parallel with the sides of the car to a point of intersection on the ½-in. x 7-in. steel bumper. These vestibule knees are supported by carrier bolts and plates held by the steel body truss under the bulkhead. These, in addition to extensions on old vestibule knees and lateral braces, hold the vestibule firmly in position. The original vestibule was replaced next, posts were securely bolted to the crown head and the intervening space in the floor and roof was filled in. This gives ample room for the conductor's compartment and for the entrance and exit double-folding doors.

As the front vestibule floor of the old cars was on the same level as the car floor it was found necessary to provide a drop pit the size of the front passenger vestibule in order to have but one step from the vestibule floor to the pavement. The steps on these cars are 15 in. from pavement to first step, 14 in. from first step to vestibule floor and 6 in. from vestibule floor into the car. The car is furnished with six rattan cross seats on each side, with longitudinal seats on both sides, front and rear, giving in all a seating capacity of forty-two passengers.

PREVENTING INRUSH OF COLD AIR

The front bulkhead has a double-acting door leading into the passenger vestibule which closes off the cold and draft when the front vestibule door on the outside is open. This door is operated jointly with the step from the motorman's compartment by means of McGuire-Cummings door-and-step operating mechanism. All steps in and out of the car are equipped with Mason lead-filled safety tread, thus minimizing accidents due to passengers slipping on the steps. The rear entrance and exit doors are operated by the conductor, the same mechanism and similar features as applied to the front

PARTIAL LIST OF DIMENSIONS IN THE REBUILT CAR

Over-all length	45 ft. 7 in.
Car body length	33 ft. 3 in.
Front vestibule length	4 ft. 4 in.
Rear vestibule length	6 ft. 10 in.
Over-all width	8 ft. 6 in.
Over-all height	8 ft. 4½ in.
Rail to top of roof	10 ft. 8½ in.
Approximate weight	36,000 lb.

door being used. The entrance to the car is the rear door of the rear vestibule, giving ample standing room while conductor is making change or issuing transfers.

Destination signs are placed in three locations—one on the right side of the front vestibule in the gothic sash and one on each side in the last gothic sash on the car body. These signs are of the roller type and are worked from the inside of the car body. There are forty-seven route names on each.

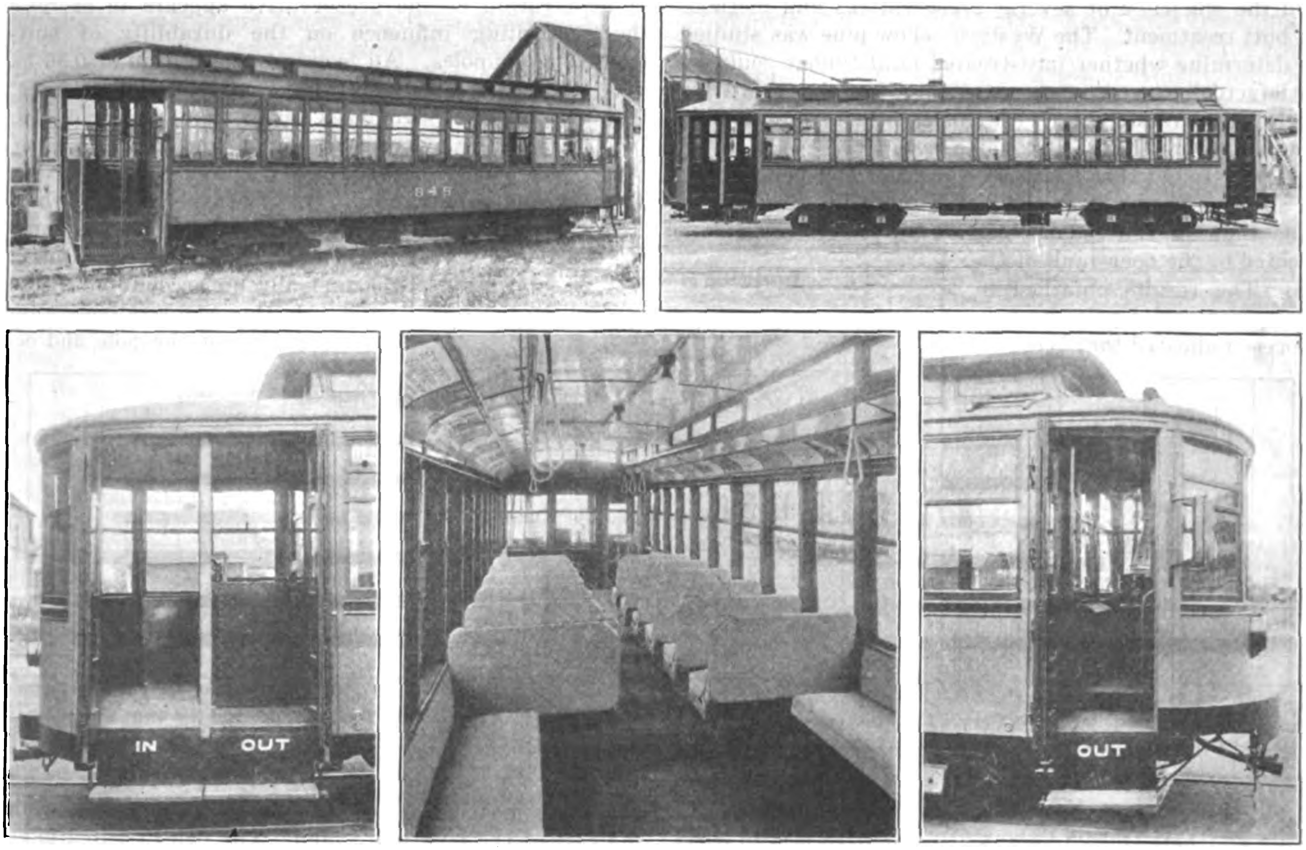
The cars are equipped with a hot-water heating system and are fitted throughout with new equipment of the latest design which comprises McGuire-Cummings No. 46 archbar trucks with 26-in. steel wheels; GE-258-C air-cooled ball-bearing motors, inside hung K6 controllers; National compressors; type G Westinghouse governors; M.R. circuit breakers; three-bank type C. G. resistor; 8-in. brake cylinders and Dayton No. 45 drop brake handles.

To give safety and convenience to the passengers, the cars are equipped with a door signal system the operation of which notifies the motorman by means of a small lamp placed in front of him when the doors are closed or open.

The Faraday high-tension buzzer system is used, with a buzzer in the front and rear vestibules. The lighting system of the car comprises one 23-watt five-light circuit with trouble light. This circuit includes the headlight, front-exit light, front destination sign light and two lights in the rear vestibule. There is also one 56-watt, five-light circuit in the car body and a selector system in conjunction therewith. All the lights in the car body and vestibules are fitted with large opal shades. The conductor's cab is equipped with an individual electric heater, folding seat, foot rest, etc.

Some dimensions of these cars are given in the accompanying table.

In the painting of the cars the enamel system has been used for the exterior and headlinings, the color scheme being tan color below belt rail, ivory above belt rail, with the exception of sash and doors, which are of cherry, while the roof is oxide red. The interior is of natural cherry oiled and varnished with ivory headlinings.



AT TOP, APPEARANCE OF CAR BEFORE AND AFTER RECONSTRUCTION; CENTER VIEW, SEATING ARRANGEMENT OF REMODELED CAR; REAR (LEFT) AND FRONT (RIGHT) PLATFORMS AS RECONSTRUCTED

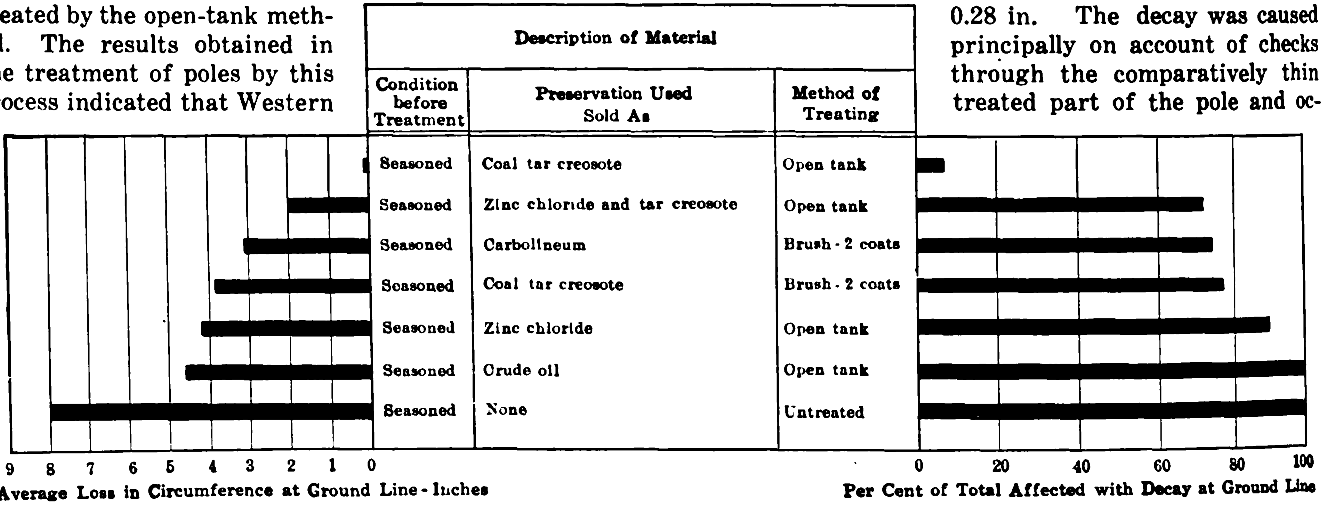
Attacking the Snow Problem

THE New York State Bureau of Municipal Information has sought reports from American cities, according to the February issue of the *American City*, on the method and kind of apparatus used for snow removal, in order to make available to municipal officials complete and up-to-date information. This is important because of the necessity of keeping at least the main arteries of travel free from snow. The reports seemed to indicate that municipal authorities are paying more attention to their methods of attack and consequently have formed some sort of an organization. Some now recognize the efficacy of beginning work while the snow is falling. The reports agree that wherever possible effective machinery should be used to reduce dependence on labor to a minimum, including the use of equipment available for temporary conversion for snow fighting.

Results with Butt-Treated Poles in California

Average Life of Butt-Treated Pine Poles Was 8.4 Years, Compared with 3.8 Years for Untreated Poles—93 per Cent of Similarly Treated Western Red Cedar Poles Sound After Eleven Years

AT THE seventeenth annual meeting of the American Wood Preservers' Association, held from Jan. 25 to 27, 1921, at San Francisco, P. R. Hicks, engineer in forest products, Forest Products Laboratory, Madison, Wis., presented a paper on experiments with butt-treated poles in California. In 1907 and 1908 the Forest Service, in co-operation with the various California electric companies, carried on a number of experiments to obtain information on the seasoning of poles and the efficiency of several preservatives and methods of butt treatment. The Western yellow pine was studied to determine whether butt-treated local timber could be satisfactorily used as a substitute for the relatively high-priced Western red cedar poles, which were usually obtained from the Pacific Northwest.



Description of Material

Condition before Treatment	Preservation Used Sold As	Method of Treating
Seasoned	Coal tar creosote	Open tank
Seasoned	Zinc chloride and tar creosote	Open tank
Seasoned	Carbolineum	Brush - 2 coats
Seasoned	Coal tar creosote	Brush - 2 coats
Seasoned	Zinc chloride	Open tank
Seasoned	Crude oil	Open tank
Seasoned	None	Untreated

CONDITION OF EXPERIMENTAL WESTERN RED CEDAR POLES IN VICINITY OF LOS ANGELES, CAL., ELEVEN YEARS AFTER PLACEMENT

It was found that greater absorption and penetration of all preservatives were obtained in the Western yellow pine than in the cedar poles treated by the open-tank method. The results obtained in the treatment of poles by this process indicated that Western red cedar poles should be seasoned to at least 25 lb. per cubic foot before treatment, which required two to eight months in this experiment, depending upon the season the poles arrived in southern California. Western red cedar could not be successfully impregnated with crude oil by the open-tank method, although a satisfactory treatment was obtained on the Western yellow pine poles. Satisfactory absorptions were obtained in the open-tank treatment of the pine and cedar poles with zinc chloride, although the pine absorbed more preservative, with a probable greater penetration, than the cedar poles. Western red cedar poles seasoned to only 31 lb. per cubic foot could be treated successfully with zinc chloride compared to 25 lb. per cubic foot which was found desirable for successful treatments with creosote.

The average life of the pine poles, butt-treated with creosote by the open-tank process, was 8.4 years, compared with 3.8 years for the untreated poles. The relatively short life of these treated poles was not on account of the failure of the treatment in the butt, but was caused by decay in the untreated top. About one-half of the pole butt-treated in zinc chloride was, however, removed on account of the decay in the treated butt. Approximately one-third of the pole butt treated with crude oil by the open-tank method failed on account of decay in the treated butt. There was no appreciable difference in the relative durability of the pine poles butt-treated with creosote and with carbolineum. The small difference in favor of the carbolineum is not sufficient to have much weight, especially in view of the result obtained in other similar experiments.

These experiments demonstrated that butt-treated Western yellow pine poles cannot be successfully used in southern California, in comparison with untreated or similarly treated Western red cedar poles, on account of the failure of the untreated tops. If this species is to be used for poles in southern California the entire pole should be treated, preferably with creosote.

Further conclusions reached showed that the depth of penetration of the preservative appears to exercise the controlling influence on the durability of butt-treated cedar poles. An average penetration of 0.56 in. was obtained in the open-tank treatment with creosote. Out of a total of 375 poles given this treatment 349, or 93.1 per cent, were still sound, and 26, or 6.9 per cent, were partly decayed after eleven years' service. The average penetration of the twenty-six poles which were partly decayed was only 0.28 in. The decay was caused principally on account of checks through the comparatively thin treated part of the pole and occurred in most cases simply as a decayed pocket, while the rest of the butt was sound. The poles treated in an open tank with zinc chloride and creosote were in somewhat better condition than those treated with creosote or with carbolineum. The butt-treated cedar poles were in better condition than those treated with zinc chloride by the open tank process.

In this experiment the value of the open-tank treatment with creosote as compared with butt treatment stands out clearly. The results with the butt treatment, however, are very good, and undoubtedly this treatment is a good investment where a better treatment is for some reason or other impracticable.

In analyzing the above data and in comparing the results obtained with treated and untreated poles in other parts of the country it must be kept in mind that on account of climatic conditions in southern California these experimental poles are subjected to decay throughout the entire year.

The creosote used for the treatment of these poles was purchased as coal-tar creosote, while the carbolineum used was what is known in the trade as "Carbolineum America."

Temperature Effects in Power Cables*

Electrical Engineers at A. I. E. E. Midwinter Convention Discuss Vital Subject of Cable Loading and Temperature as Related to Life—Possible Change in Standard Rule of Institute in View—Present Rule Considered Conservative, but Sentiment Favors Reasonable Factor of Safety to Insure Satisfactory Durability

AT THE Thursday morning session of the recent midwinter convention of the American Institute of Electrical Engineers six papers were presented under the auspices of the sub-committee on wires and cables of the standards committee. The papers were as follows: "The Maximum Safe Operating Temperatures of Low-Voltage Paper Insulated Cables," by W. A. Del Mar, chief engineer Habirshaw Electric Cable Company; "Permissible Operating Temperature of Impregnated Paper Insulation in which the Dielectric Stress is Low," by Philip Torchio, chief electrical engineer New York Edison Company; "Permissible Operating Temperatures of Impregnated Paper Insulation in which the Dielectric Stress is Low," by D. W. Roper, superintendent of street department Commonwealth Edison Company; "Notes on the Effect of Heat on Impregnated Paper from Cable Insulation," by W. S. Clark, engineer wire and cables General Electric Company; "The Effect of Heat Upon Paper Insulation," by H. W. Fisher, chief engineer Standard Underground Cable Company, and R. W. Atkinson, assistant to chief engineer Standard Underground Cable Company; "Permissible Operating Temperatures of Impregnated Paper Insulation in which the Dielectric Stress is Low," by L. L. Elden, electrical engineer the Edison Electric Illuminating Company of Boston.

STATEMENT OF THE PROBLEM

In opening the symposium Mr. Del Mar listed these five questions as embodying the preliminary problems involved in determining the safe operating temperature of an insulating material:

1. What is the criterion of quality of paper insulation by which we may say whether it is satisfactory for service?
2. What is the effect of the continued application of various degrees of heat, expressed in terms of the criterion selected?
3. Will intermittent heat have the same effect as continuous heat provided the aggregate time of exposure and the temperature are the same in both cases?
4. If the above questions should be satisfactorily answered, what form of rule should be adopted so as to make the best economic use of the information thus obtained?
5. If a rational rule for the maximum permissible temperature of paper insulation should be developed, how can the hottest-spot temperature of a cable in a duct be measured in order to insure that the cable is working within the rule?

For low-voltage cables the criterion of quality is mechanical strength, best indicated by means of the tearing test. For this test a piece of paper about 3 cm. wide is carefully cut with a razor along its center line from one end to about its center and a pencil mark made 1 cm. beyond. It is then suspended from one of the small ends and a balance pan is attached to the small free end, the large end being allowed to swing free. Sand is then poured continuously into the pan until the paper begins to tear. The stream of sand is then continued slowly, stopping if the paper continues to tear, but proceeding if the tearing stops. It is continued until the tear reaches the centimeter mark. The total weight of pan and sand is taken as the tearing strength of the paper. The tearing strength of unimpregnated Manila rope paper 8 mils thick, under ordinary conditions, is from 6 to 10 oz. When the paper is impregnated the tearing strength is usually less than this.

Mr. Del Mar gave the results of tests made to determine the effects on insulating paper of moisture, continuous heating and intermittent operation. He concluded, however, that even with all of the above questions satisfactorily answered there would still be the difficulty of applying the information to practical operating conditions, because it is almost impossible to ascertain accurately the hottest-spot temperature of a cable in a duct. This problem is complicated by the presence of other cables in neighboring ducts and by the variable thermal resistivity of the soil.

The present interest in this subject arises from the increased loads which war conditions suddenly imposed on the power plants and the consequent enforced operation of cables at higher temperatures than were previously thought safe. Experience indicates that low-voltage cables may be operated at higher temperatures than were considered safe a few years ago.

OPERATING TEMPERATURES FOR CABLES

In his paper Mr. Torchio reviewed the effect of temperature on insulating materials, abstracting from the 1913 Steinmetz and Lamme report to the Institute and the 1905 British Engineering Standards Committee tests. He gave surveys of low-tension cables in large distributing systems, and special tests on cables including sheath cracking, high temperature tests, effect of bending on cables heated to high temperatures, distillation of cable compounds, ambient temperatures in subway ducts as affected by thermal conductivity of concrete, amount of moisture in soil, different arrangements of ducts and load factors at which the cables are operated.

He stated that the principal reasons advanced for adopting lower temperature limits than 105 deg. C. for cables have been: (1) That the compound in the cable, when warm, may leave the paper, especially when the cable is installed in inclined ducts, with a tendency to flood the lower portion of the cable and to leave the upper part of the cable dry; (2) that cables are oftentimes removed from subways for reinstallation in other locations and, therefore, if the paper becomes brittle, it would crack inside the lead sheath. Further, low temperatures are advocated because the expansion and contraction of long lengths of large size lead-covered cables may cause cracking of the lead sheath at sharp bends in manholes.

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*Abstracts of a group of papers presented at Ninth Midwinter Convention of American Institute of Electrical Engineers, New York City, Feb. 17, 1921.

He showed these reasons are insufficient to make an exception to the A. I. E. E. standards rules for Class A insulation for 105 deg. C. for low-tension cables:

Recommendations for Temperature Limits

After analysis of available operating data Mr. Torchio's conclusion was that the permissible operating temperatures of impregnated paper insulation, in which dielectric stress is low, are to be a function of the load factor at which the cable operates. The load factor for cables used in systems of distribution is intended to be the ratio between the yearly average load and the maximum load on the cable. He suggested for consideration for impregnated-paper, low-tension cables the temperature limits in function of the load factor of the cable, as follows: 105 deg. C. for load factors around 33 per cent, 95 deg. C. for those around 50 per cent, and 90 deg. C. for those over 66 per cent.

Cable Experience in Chicago

In his brief paper Mr. Roper told of practical experience with cable loads in Chicago. Test data indicate that the maximum copper temperature of low-tension feeder cables in the large and crowded conduits of the Commonwealth Edison Company immediately adjacent to the substations is generally higher than 105 deg. C., and in a number of locations considerably exceeds this figure for several hours per day for each of five days in the week during the winter months.

He considered it reasonable to conclude that when the copper of one of the low-tension cables on the distribution system reaches a maximum temperature of 180 deg. it is being heated beyond a safe limit, and deterioration of the insulation will result, and, further, that the deterioration will be greater if there are holes in the lead sheath at the point where such temperatures are reached.

Mr. Roper concluded also that not only should due consideration be given to the time during which the maximum temperature of the copper persists, but also that in an operating system it is not possible to determine the maximum safe limit exactly, as the temperatures are continually changing. Apparently the best that can be done is to determine the maximum temperature and also plot average curves showing the number of hours per year that temperatures near the maximum are maintained. From an examination of the insulation of cables corresponding to a number of such curves it should be possible to establish, first, a lower limit at which the insulation will not be injured, even when the temperature is maintained for long periods of time, and, second, an upper limit above which it is certain that the insulation will be injured if such temperature is maintained for any considerable time. From the information so far obtained in Chicago, the best that can be done is to place the lower limit at about 110 deg. C. and the upper limit at about 180 deg. C.

Results of Manufacturers' Tests

Mr. Clark gave the results of tests made within the past four years to determine the effect of heat on impregnated paper. Experimental data showed that under the action of heat the tensile strength of the paper deteriorates less rapidly than its resistance to tearing. From the results obtained Mr. Clark felt warranted in stating, in a preliminary way, that deterioration at 70 deg. is negligible; at 100 deg. it is marked in ninety days; at 110 deg. it is marked in thirty days, applying to the particular quality of paper and impregnating compound which were under test. He concluded that the temperature limit fixed for the operation of a low-tension cable, to avoid undue deterioration, must take into consideration the length of time during which the temperature is maintained.

Messrs. Fisher and Atkinson discussed in detail the mechanical properties of papers, especially as influenced by drying, heating and impregnating. They described an instrument for measuring tearing strength, which differed from that mentioned in Mr. Del Mar's paper in that a spring is employed instead of a weight. They based their paper upon the results of tests made under a wide variety of conditions.

Among many interesting facts developed the first striking one is that impregnation itself affects only very slightly the tearing resistance of the paper. The cause of the great loss of tearing strength when the sample of paper is dried and impregnated is the change in moisture content and is not due to the impregnation with compound. The next fact is the large variation in tearing resistance with change in moisture content of the paper. With the paper tested and with the oils used, and for the relatively short series of tests which were made, there was a small difference between the aging effect at a given temperature of paper submerged in oil and paper exposed to air in an inclosed vessel, either sealed or unsealed.

Coming to the matter of allowable temperatures for cables, Messrs. Fisher and Atkinson pointed out that while cables have been in service for long periods of time and with various degrees of deterioration of the paper, even up to practically complete carbonization, there is not any extensive record of the serviceability of cable in considerably damaged condition. Furthermore, it is probable that such cable furnishes a large proportion of the operating failures that are not due entirely to external injury, an amount of failure insignificant in comparison with the amount of such cable in service, and such cables may fail in service from injury due to causes which would not be harmful to good cable. Many of the cables known to have operated successfully after severe overheating have had very liberal insulation thicknesses.

The authors considered that it would be unreasonable for the A. I. E. E. to standardize operating conditions which would materially reduce the serviceability of cables from the standpoint of ability to remove and reinstall them without injury. They suggested that a temperature limit be assigned which may be expected to produce a reduction of 20 per cent of the original tearing resistance of the paper in, say, five years. This would work out somewhat as follows for temperature allowances:

For continuously maintained temperature..............	78 deg.
For maximum temperature maintained five hours per day, temperature during remaining part of day low..	85 deg.
For maximum temperature maintained two and one-half hours per day, temperature during remaining part of day low..	90 deg.
For maximum temperature maintained one-half hour per day, temperature during remaining part of day low..	100 deg.

Boston Edison Loading Practice Is Conservative

The final paper in the series, by L. L. Elden, gave the results of the experience of the Edison Electric Illuminating Company of Boston. He stated there is no doubt as to the safety of low-voltage cable operation indefinitely at the 85-deg. allowance provided in the present standards rule. In the last analysis the sheath temperature is the only definite factor from which to determine the actual operating temperature of a cable, since from it the temperature of the conductor can be determined with fair accuracy. It cannot be denied, stated Mr. Elden, that if paper is subjected to high temperatures its useful life as insulation must be shortened, but the real question for the cable user to decide is the rate of depreciation that he is willing to accept as the result of operating his cables at high temperatures.

The practice in Boston has been not to exceed the temperature limit of 85 deg. C. During eighteen years of use of single-conductor and concentric low-tension feeder cables there is no record of a failure of these due to loading conditions. While this practice may be considered ultra-conservative it is felt to be justified by the freedom from service interruptions.

Referring to Mr. Torchio's suggestion as to a load-factor basis for rating, Mr. Elden expressed preference for an overload rating for low-tension cables which may be taken advantage of as occasion requires. The objection which he raised to the load-factor basis of rating was the impracticability of application to the operation of any system of distribution, as in practice each feeder operates on a load factor of its own.

SUBJECT DISCUSSED FROM SEVERAL ANGLES

Following the presentation of the papers abstracted above, the topic was treated briefly by a number of cable makers and users. Without reference to these by name the substance of their remarks was as follows: One said that expansion and contraction of cables is not given the attention it deserves. He gave the life of a cable as twenty years. Most of those discussing the subject did not favor an increase in temperature rating, preferring to have the rating conservative and to depend upon the judgment of the operating engineer as to the circumstances under which the rating can be safely exceeded.

Standardization of Insulated Wires and Cables

A CONFERENCE on the standardization of insulated wires and cables was held in New York on Feb. 2. The conference, which was called by the American Engineering Standards Committee at the instance of the American Railway Engineering Association, was attended by representatives of fourteen national organizations. After a thorough discussion of the many considerations involved, it was unanimously decided that "The unification of specifications for wires and cables for other than telephone and telegraph use should be undertaken under one general plan, covering substantially all the more important uses." It was agreed that work on the following should be included: Conductor, quality, stranding, sizes; rubber insulation; varnished-cloth insulation; impregnated paper insulation; magnet wire (including enamel, cotton and silk insulation); fibrous covering (including asbestos); sheaths; armor; standard make-ups.

It was the consensus of opinion that it would be desirable to have all the American wire and cable standards assembled in a single book. The proposed work will be carried out under the auspices and rules of procedure of the Standards Committee.

Canadian Railway Club Considers Tramway Operation

Montreal Tramways Department Head Explains How Co-operation Between Public and Street Railway Operators Can Be Made to Yield Large Savings and Improved Service—Meeting Attended by About 200

A MEETING of the Canadian Railway Club, held in Montreal Feb. 8, was attended by about 200 members and guests. Among the latter were a number of electric railway men from Boston and New York who were on their way to the American Association meeting at Chicago.

D. E. Blair, superintendent of rolling stock Montreal Tramways, read a paper under the title "Some Engineering Features of Tramway Operation." His purpose was to discuss in a general way the practice which underlies an efficient system of transportation, and he drew a line clearly between those factors whose development lies in the hands of the operating company and those from which beneficial results can come only through the help of the public.

Mr. Blair explained that present tramway equipment has reached a high standard. The art has reached the stage where little that is within control of the railway managers remains to be done to improve the standards of modern car service. He raised the question as to whether existing conditions can be modified, without injury to other interests, so as to result in worth-while improvements, and the paper is the author's answer to his own question. A few of his principal points are summarized below:

The primary requisites of a satisfactory system of transportation include speed, safety, comfort, continuity, frequency and convenience of service. Associated closely with these is economy. Speed of transportation should be the outstanding objective of all effort toward improvement, and increase of speed within the practical limitations of street traffic will tend toward greater economy without necessarily affecting the question of safety. Higher speed will add materially to service efficiency.

Mr. Blair based the body of his paper on a discussion of the elements of the "speed-time curve," taking up separately the acceleration, coasting, braking and rest periods. He outlined the mechanics of this subject in non-mathematical fashion and showed how intelligent operation of a car will conduce to economy. He emphasized also the urgency of reducing the number and duration of stops, a phase of operation which is largely in the hands of the public. Of special importance are traffic delays and, under present conditions, operating companies are providing far more cars than are necessary to perform the relatively poor service rendered, but it is physically impossible to bring these cars into efficient and expeditious service on account of the slow dispatch of car units past congested areas.

Summarizing the whole situation, Mr. Blair lists the following points: Higher schedule speeds are desirable from every point of view, and can be obtained without extra cost and without affecting safety of operation. The higher speeds will result in an improved degree of comfort and frequency of service on account of reduced overcrowding and reduced headway between cars. The securing of speeds higher than those now prevailing depends almost entirely on reducing the number and duration of stops, decrease in the former item being more important than in the latter. The patrons' convenience is only a relative factor, because an extra walking distance of a few feet is of no real moment when compared with the outstanding advantage of quick transportation. Appreciably higher speeds cannot be obtained by any possible means within the control of operating companies; improved service rests in the hands of the users of cars. Questions of car design, motor equipment, routing of cars, etc., are important, but their effect on the quality of service is negligible when compared with the possibilities of improvement along the lines suggested. The bogie of high cost cannot be used as an argument against faster service because higher speeds in city transportation tend toward lower operating costs. Higher speeds will result in a more efficient use of existing equipment. It is absolutely essential that all possible means of increasing efficiency of existing rolling stock be investigated to offset at least in part the increase in labor cost.

In the discussion which followed the presentation of Mr. Blair's paper, C. N. Duffy, Philadelphia Rapid Transit Company, spoke of the good results obtained in Philadelphia by the use of skip stops and pay-as-you-pass cars, eliminating much of the time lost in the rest periods. He laid particular emphasis on the absolute necessity of educating the public to see that it is as much to the people's advantage to increase speed of cars as it is to that of the railway. If they can once be made to realize this, there would soon be a demand that stops be placed farther apart than they are.

T. Ahearn, president Ottawa Electric Railway, spoke of the results he had witnessed in Cleveland and San Diego in the use of pay-as-you-pass cars. He had been so strongly impressed by the saving in time and the resulting increased speed of the service that he expects before long to introduce the same plan in Ottawa. He also dwelt briefly on the saving in time and power achieved through the use of power-on-time recorders which had recently been installed in Ottawa. He reinforced Mr. Blair's point that the best way to operate a car, from both the safety and economy standpoints, is to accelerate and brake rapidly, coasting as far as possible.

Col. J. E. Hutcheson, general manager Montreal Tramways, added to the discussion along the lines of public education, which he said is one of the vital factors in speeding service. He also pointed out some of the difficulties in doing this educational work. Colonel Gaudet, Director of Public Works of the city of Montreal, expressed much interest in that part of Mr. Blair's paper relating to safety stops, regulation of service and overcrowding of cars. He voiced his desire to have the general principles outlined put into concrete shape for application in Montreal.

Owing to the fact that the delegates to the Chicago conference had to leave before the meeting was concluded, the meeting adjourned after brief remarks by W. F. Graves, chief engineer Montreal Tramways, and G. Gordon Gale, vice-president Hull Electric Company, recently elected president of the Canadian Electric Railway Association. A vote of thanks to Mr. Blair was passed, with the suggestion that the discussion could have been carried further with much profit.

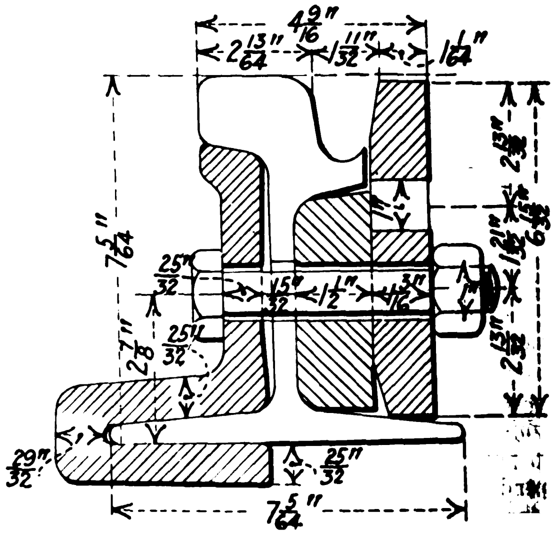
The Bureau of Economics of California has recommended the development of hydro-electric power and electrification of railroads to conserve the oil supply of states.

German Association Meets

THE annual meeting of the Verein-Deutscher Strassenbahn und Kleinbahn Verwaltungen was held in Nuremberg Nov. 28-Dec. 1. Papers were presented on the following subjects, among others: Fares, freight traffic, track construction in asphalt and wood paved streets, rail joints, the economic situation, rail corrugation, roadway maintenance, automatic couplings.

The association has five standing committees, as follows: (1) Rail corrugation, (2) standardization, (3) rails for curves, (4) anti-friction bearings, (5) wear of steel tires. At the Nuremberg meeting reports were received from each of these committees.

The committee on rail corrugation presented two papers, one by Professor Oberhofer of Breslau, describing tests which had been conducted with high and low carbon steel, the other by Chief Engineer Wochert of Mannheim, who discussed the possibility of oscillating friction being a cause of corrugation. The committee on rails recommended among other standards two types of rails for curves, one a guard rail of normal section for curves of 50 meters (165 ft.) radius and over, and a renewable lip rail for curves of smaller radius. A section of the latter for a 180 mm. (7 in.) rail is shown, the dimensions being given in inches. The renewable lip is made of manganese steel. Tests are being conducted by Committee No. 4 on all types of anti-friction bearings and by Committee No. 5 to determine the proper carbon content for tires under different conditions.



GUARD RAIL WITH RENEWABLE LIP FOR SHORT RADIUS CURVES

The president of the association during the past year has been Director Wussow of the Grosse Berliner Strassbahn, and Prof.-Dr. F. Helm has been secretary.

In its annual report for 1920, the Ontario Safety League, which has its headquarters in Toronto, lists a large number of items of safety work which have been conducted along lines somewhat similar to those followed by the National Safety Council. During the year a three-day convention was held, with representatives from provinces other than Ontario, and an intensive "safety-week drive" was also conducted in fifteen towns and cities in the province with excellent results. Work with the electric railways constitutes an important branch of this safety service.

Copper Requires Careful Handling

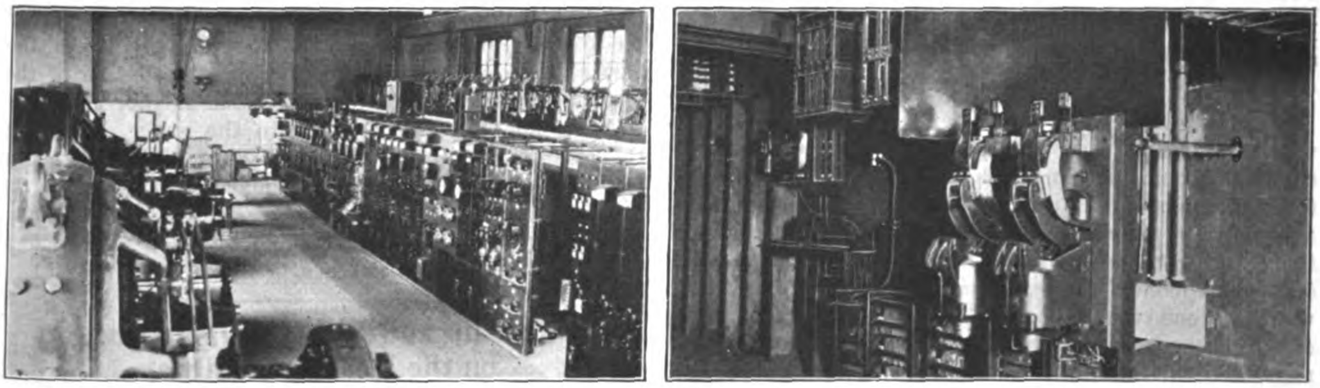
AN ARTICLE of considerable value to motor repair men dealing with the handling of copper appeared in the February issue of the *Electric Journal* over the signature of J. V. Dobson. He points out that copper cannot be given the same rough treatment that iron, steel or brass will withstand, but requires certain precautions in handling and application. For example, all bends in copper should be made free and easy, for where sharp bends and sharp fillets are made, the effects of vibration, expansion and contraction, or the "throwing out" forces due to rotation, show up first. Nicking also should be avoided because nicks are the starting points for breaks.

It is very easy to nick copper with the sharp edge of a metal drift or with a knife at the point where the insulation has been cut off a wire. Furthermore, the necessity is usually overlooked of providing means for the copper to expand and contract to take care of the relative motion between the different materials for the changes in temperature. As to centrifugal-force effects, even though the weight of a solid conductor may seem small, it is sufficient under vibration to cause motor and field leads to fail miserably if not properly supported.

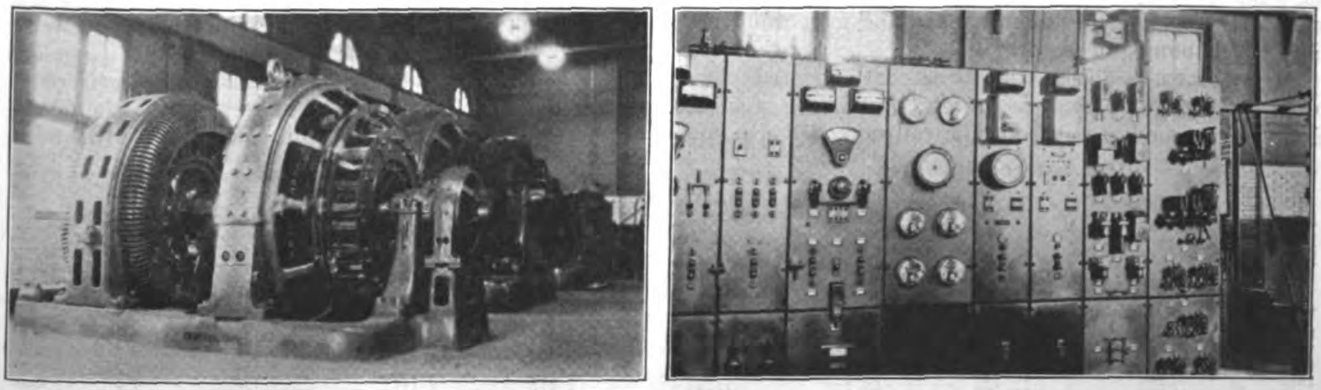
Copper is subject to a form of sickness, which so far as has been experienced is peculiar to it alone. All commercial copper contains a small amount of oxygen in the form of copper oxide, without which it had poor mechanical characteristics. When heated in a flame rich in free hydrogen, this hydrogen unites with oxygen forming free copper and steam. The hydrogen will readily enter the hot copper, but the steam cannot get out. The copper is thus not only weakened by the elimination of the copper oxide, but the high-pressure steam expands, producing a spongy effect which still further weakens the copper. This effect is, of course, greatest near the surface. This peculiar form of sickness should be guarded against by operating men. When copper is heated in a gas and air furnace an excess of air should always be used, as deficiency of air will produce an excess of free hydrogen.

2,000-Kw. Motor-Generator Set of the Michigan Central Railroad

MENTION was made in the issue of the ELECTRIC RAILWAY JOURNAL of Jan. 8, 1921, in an abstract of a review prepared by W. D. Bearce, railway and traction engineering department General Electric Company, of the 2,000-kw., 660-volt synchronous motor-generator set with complete automatic control for the Detroit River tunnel electrification of the Michigan Central Railroad. This unit, which has been in operation for several months, is now the largest in railway service to be operated by automatic control. The accompanying illustrations showing it were made from recent photographs. The two machines in the background are the 1,000-kw. synchronous motor-generators installed with the original equipment. In the close-up view of the switchboard the section on the extreme right is the automatic contactor panel and adjacent to it the automatic relay panel. Then come three sections which are feeder and meter panels, while the next two are respectively the motor panel for the new set and the compensator and auxiliary panel. The remainder of the auxiliary equipment is installed in the basement.



AT LEFT, GENERAL VIEW OF SWITCHBOARD IN MICHIGAN CENTRAL DETROIT RIVER TUNNEL SUBSTATION. AT RIGHT, POSITIVE BREAKERS INSTALLED IN THE BASEMENT OF THE STATION



AT LEFT, 2,000-KW. SYNCHRONOUS MOTOR-GENERATOR SET. AT RIGHT, VIEW OF THE SWITCHBOARD, SHOWING SOME OF THE AUTOMATIC PANELS

Novel Base for Incentive

Proposal to Have It Vary in Service-at-Cost Franchises as Fares Vary from an Established Ratio of Fares to Money Rates or Commodity Values

A NOVEL method of establishing an incentive in service-at-cost franchises for public utilities was suggested Jan. 28 in a talk on this subject before the Grand Rapids Engineering Society by Harry Barker, of Horton, Barker & Wheeler, engineers. Mr. Barker first points out it is not wholly desirable with a bonus to the stockholders or to the men and management to have the bonus rise as rates fall and fall as rates rise. Costs and rates naturally tend to rise as prices rise, and it will not do at a time of high prices to cut off the inducements for economies and efficiencies just when they are most needed. A better plan, in his opinion, is to set up parallel ranges of base rates and base costs as measured by, say, bank loans, or the Dun index figures for prices of commodities and labor might be used. From such a table, a base rate can be found that is normal for the prevailing cost of money (or prevailing prices of commodities and labor). Then for each step that actual rates are lower than this normal rate the bonuses might be stepped up in accordance with a prearranged scale. Mr. Barker believes that the management and men should share in any bonus plan.

To illustrate his plan he assumes a case where a careful investigation has shown that the fares of a certain street railway under normal operation with fair profit were more or less as follows:

3½ cent fare when money was at	3½ per cent
4 -cent fare when money was at	4 per cent
4½-cent fare when money was at	4½ per cent
5 -cent fare when money was at	5 per cent
5½-cent fare when money was at	5½ per cent
6 -cent fare when money was at	6 per cent
6½-cent fare when money was at	6½ per cent
7 -cent fare when money was at	7 per cent
7½-cent fare when money was at	7½ per cent
8 -cent fare when money was at	8 per cent

Then if actual fares were 7 per cent and bank money was being loaned out at 6 per cent, this hypothetical company would get no bonus, for the normal fare for 6 per cent money is 6 cents. If, however, by good management and effective co-operation by the employees the fares were brought down to 5½ cents in times of 6 per cent money, then the company and the employees would get one step of a bonus—say one-half of 1 per cent extra return on the franchise valuation for the company, and for the men 4 per cent bonus on their yearly wage. If continued progress by company and employees brought the fares down to 5 cents and money still stayed at 6 per cent then the company would be allowed 1 per cent extra return on valuation, and the men would get 8 per cent bonus on wages.

Mr. Barker said that the direct ratio quoted above was intended of course as purely illustrative and not definitely to apply to any specific railway. He also suggested that any bonus incentives to be fair should be recast every five, ten or fifteen years so that as the peculiar economies of one property and management are overtaken by the general progress of the art the public shall not continue to pay the bonus.

In the same address Mr. Barker also discussed the proper size of the index reserve fund under a service-at-cost franchise and spoke of from 4 to 12 per cent of the value of the system as being a figure at normal level which has been used. In his opinion this fund could often economically be carried as a bookkeeping reserve and the cash put to work, in the same manner that the depreciation reserve is now commonly handled.

Rehabilitating Brick Pavements

AN ECONOMICAL method of repairing a brick pavement in Appleton, Wis., the surface of which had become very rough and corrugated, was described in the February issue of the *American City*. There were places in the pavement where the joints were worn down between the bricks from ½ to 1¼ in. from the original surface, and it was estimated that it would cost $1 per sq.yd. to turn over and clean the bricks of the 29,000 sq.yd. of pavement in question.

The method finally resorted to was to clean the pavement thoroughly by flushing and then go over the surface with brooms and small hooks to remove all the dirt between the joints that the flusher had not taken out. After the pavement was thoroughly dry a ¼-in. coating of Tarvia "A" was spread on the surface of the brick. The Tarvia was worked at about a temperature of 225 deg. F. The material was spread evenly with ordinary floor squeegees with a rubber edge and then a coating of pea or roofing gravel was spread to a depth of about ½ in. After the gravel was applied a 10-ton roller was run over the surface, which forced the gravel into the binder in the joints between the bricks, while the gravel that lay on the surface of the brick was generally crushed to several smaller pieces.

Applying this new surface to the street, including the cleaning, applying binder, rolling, etc., took about ten days. The total cost per square yard amounted to about 15 cents. It took about ½ gal. of Tarvia to cover a square yard and about 1 cu.yd. of sand was enough to cover 96½ sq.yd. of surface.

Steam and Electric Operation on the Rhaetian Railway

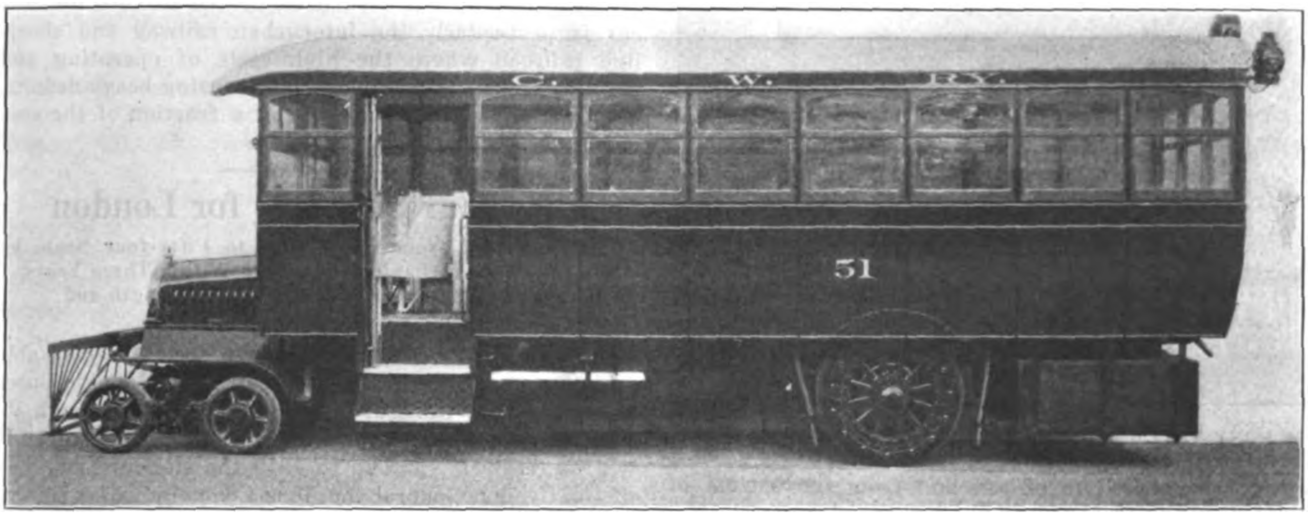
THE Rhaetian Railway operates about 186 miles of meter-gage track in the canton of Grisons, Switzerland. Electrification was commenced in 1913 and it is not yet completed. The early electrification was covered in the issue of this paper for April 4, 1914, page 760. The accompanying data from the issue of *Schweizerische Bauzeitung* for Dec. 11, 1920, show not only the figures for electric operation but permit comparison with steam.

OPERATING DATA OF RHAETIAN RAILWAY, SWITZERLAND

Year	Gross Thousand Ton-Miles	Energy Consumption in Kilowatt-Hours	Energy Consumption Watt-hrs. per Gross Ton-Mile	Energy Cost per Kilowatt-Hour Cents	Coal Consumption and Cost per Gross Ton-Mile with Steam Locomotives		Energy Cost with Electric Locomotives per Gross Ton-Mile, Cent	Lubricant per Thousand Gross Ton-Miles	
					Pound	Cent		Steam, Pounds	Electric, Pounds
1913	14,070[1]	980,450[1]	69.6	1.426[2]	0.340	0.106	0.100	1.1	0.8
1914	21,610	1,537,750	71.0	1.770	0.325	0.111	0.118	0.7	0.6
1915	18,150	1,370,850	75.5	1.804	0.328	0.116	0.136	0.7	0.6
1916	18,200	1,369,100	75.2	1.806	0.319	0.127	0.136	0.6	0.6
1917	16,980	1,303,200	76.6	1.870	0.311	0.136	0.143	0.6	0.6
1918	16,560	1,245,700	75.2	1.930	0.326	0.385	0.144	0.5	0.5
1919	25,970	2,140,900	82.5	1.554	0.337	0.595	0.125	0.6	0.5

[1] Six months only.

[2] Based on 19.3 cents exchange value of the Swiss franc. Electrical energy is purchased from the Brusio Supply Company.



NEW GASOLINE VEHICLE FOR USE ON RAILS

One-Man Gasoline Motor Car

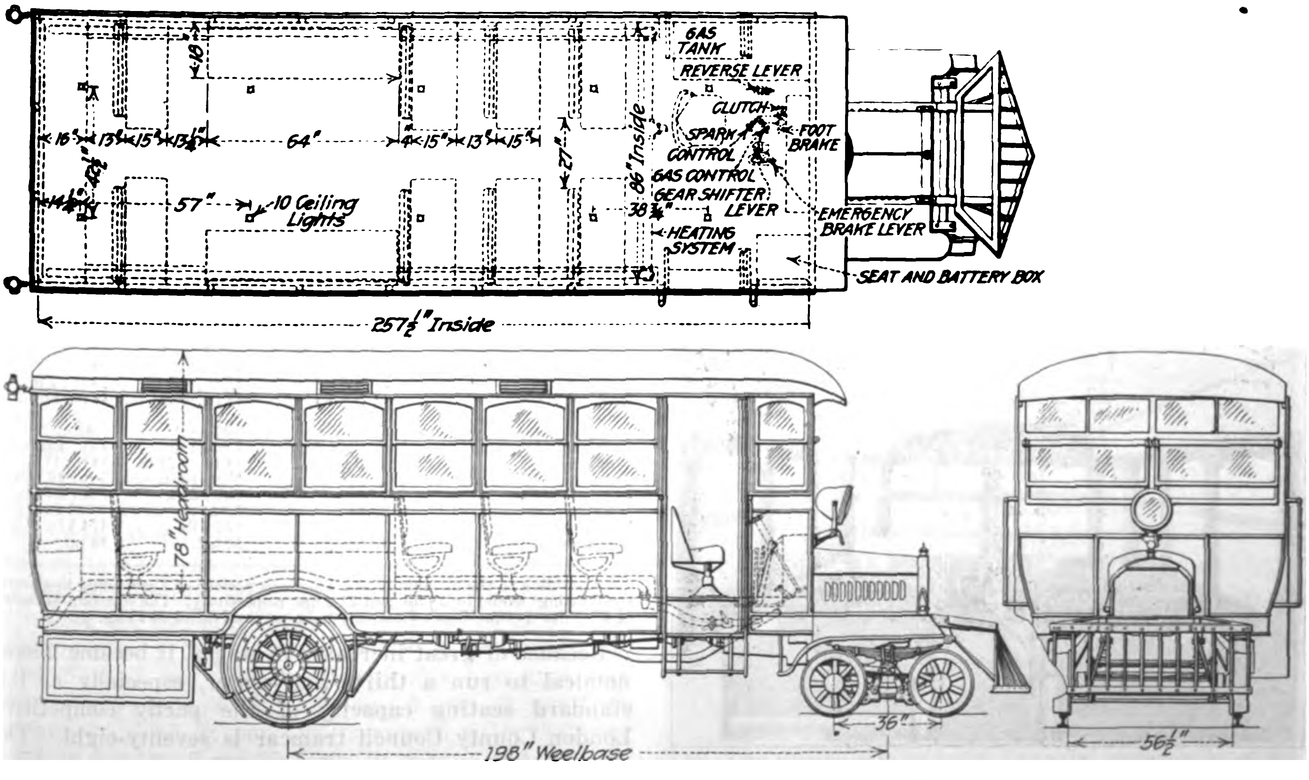
A New Vehicle for Operation on Rails, Built for Use on the Chesapeake-Western Railway, a Steam Line in Virginia, Has the Front End Mounted on a Small Four-Wheel Pivotal Truck

A NOVEL form of gasoline-driven motor railroad car has been put in commission by the Chesapeake-Western Railway, a steam road in Virginia. The car resembles the large type of single-deck motor bus extensively operated on the streets of cities, with the difference that under the front of the vehicle is a small four-wheel pivotal truck which enables the vehicle to take curves more easily and at higher rates of speed than with two wheels and axle of the ordinary bus.

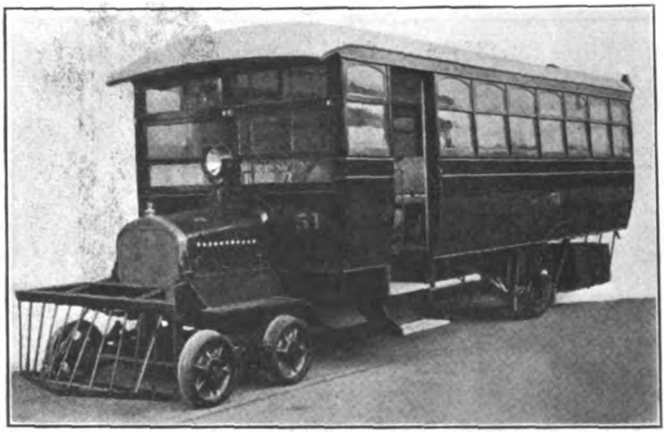
The car consists essentially of a 2-ton Mack dual-reduction motor truck, a Mack standard engine and transmission, with an additional transmission to give three speeds in reverse instead of the usual one speed. The following are the principal dimensions:

Wheelbase of chassis	16 ft. 6 in.
Wheelbase of pony truck	3 ft.
Seating capacity	31 passengers and driver
Length over corner posts	21 ft. 11 in.
Length over pilot	27 ft. 10 in.
Width of posts at belt rail	7 ft. 10⅛ in.
Weight complete	12,000 lb.

This new type of rail bus is being put on the market by the International Motor Company, New York City, which supplied the chassis and power plant, while the body and pony truck were built and installed on the chassis by the J. G. Brill Company, Philadelphia. The body was constructed according to the best body building practice, having a composite underframe of yellow pine side sills, oak end sills and 3-in., 4-lb. steel channel crossings, all securely bracketed together. The


GAS TANK
REVERSE LEVER
CLUTCH
FOOT BRAKE
SPARK CONTROL
GAS CONTROL
GEAR SHIFTER LEVER
EMERGENCY BRAKE LEVER
HEATING SYSTEM
SEAT AND BATTERY BOX
16"
13"
15"
13½"
64"
4"
15"
13"
15"
18"
27"
86" Inside
38¾"
14½"
57"
10 Ceiling Lights
257½" Inside
78" Headroom
36"
198" Weelbase
56½"

PLAN AND ELEVATIONS OF THE NEW VEHICLE



A PONY TRUCK FACILITATES HIGH-SPEED OPERATION

upright members are of ash and from the bottom of the side sill to the belt rail the body is sheathed in No. 18 sheet steel. The letter boards are of poplar.

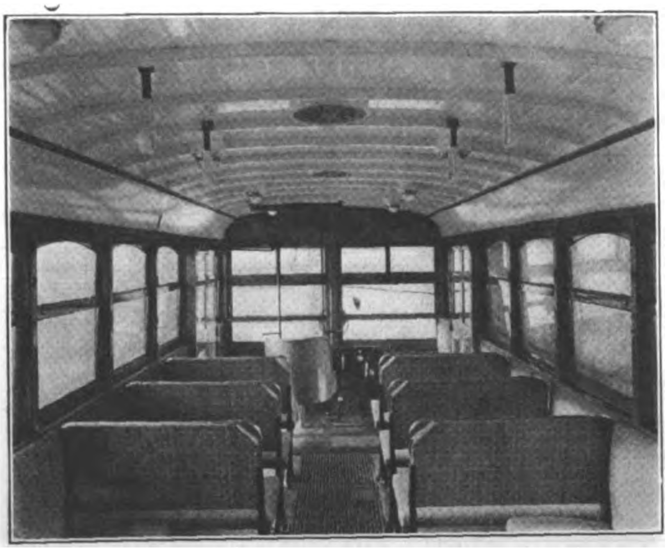
The roof is of the plain arched type and is greatly reinforced by the use of suitable steel rafters placed advantageously to strengthen the construction where needed. The roof boards are $\frac{5}{16}$-in. poplar and are covered with No. 8 canvas well lined in white lead. Three ventilators of the Brill "exhaust" type, used extensively on electric railways, are placed along the center line of the roof.

A two-leaf folding door is located on each side of the front end of the body and is manually operated by the driver from his seated position. Two stationary steps are included at each door opening for passengers entering and leaving the bus.

The upper part of the double side-sash is stationary, while the lower is arranged to drop into a window pocket. In the front end of the body one of the sashes on each side is hinged similar to the standard motor bus windshield practice.

The seats are of the Brill light-weight non-reversible "Waylo" type, which are the same as used in the single-end Birney safety car. They are upholstered in rattan and equipped with bronze grab handles.

Under the body at the rear are provided two baggage boxes which are strapped to the bottom of the bus with suitable hoop irons. Four Brill patented "Dumpit" sand boxes are supplied, two over each rear wheel, mechanically operated from the operator's position.



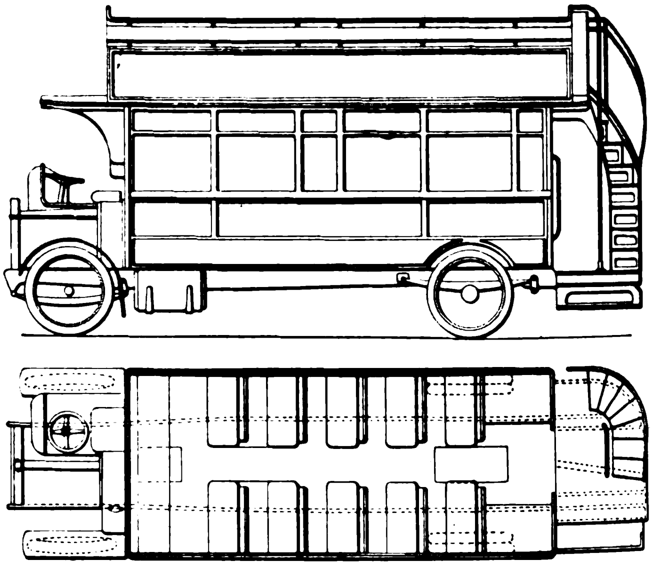
THE CAR IS WELL LIGHTED AND VENTILATED

The field which is visualized by the makers for this car is particularly the interurban railway and short-line railroad where the high costs of operating and maintaining steam equipment are causing heavy deficits. A car of this type can be run at a fraction of the cost of steam equipment.

Fifty-four Seat Bus for London

Capacity Raised from Thirty-four to Fifty-four Seats by London General Omnibus Company Within Three Years, with But 2 Ft. Increase in Over-All Length and 16 per Cent Increase in Weight

THE years 1919 and 1920 have seen a remarkable advance in the design and capacity of motor buses by the London General Omnibus Company through its building ally, the Associated Equipment Company. It will be recalled* that up to 1919 the standard city bus of the London General Omnibus Company was a thirty-four-seat double-decker designated as Type B. This was a mobile vehicle but not particularly fast because the rear platform was too narrow to permit entrance and exit simultaneously. As the lower deck of the Type B was not wide enough for cross seats on both sides, most "B" buses had longitudinal seats below, but a few had cross-seats on one side and a longitudinal seat on the other.



NEW TYPE S BUS AS PLANNED TO SEAT FIFTY-SEVEN, BUT LATER MODIFIED TO SEAT FIFTY-FOUR

COMPARISONS OF DOUBLE-DECK, OPEN-TOP LONDON BUSES

	Type B	Type K	Type S
Seats	34	46	54
Over-all length	22 ft., 6.5 in.	22 ft., 6.5 in.	24 ft., 7 in.
Body length	11 ft., 9.25 in.	13 ft., 10.75 in.	16 ft., 1 in.
Actual linear dimension per seated passenger	8 in.	5.87 in.	5.46 in.
Over-all width	6 ft., 10 in.	7 ft., 1 in.	7 ft., 1 in.
Wheelbase	12 ft., 10.62 in.	14 ft., 2.25 in.	14 ft., 11 in.
Track	5 ft., 8 in.	5 ft., 10 in.	5 ft., 10 in.
Rear overhang	7 ft., 7.38 in.	6 ft., 8 in.	7 ft., 2.75 in.
Weight empty	8,064 lb.	7,924 lb.	9,380 lb.
Weight per seat	237 lb.	172.8 lb.	173.5 lb.
Horsepower*	30 hp.	30 hp.	34 hp.

* According to the formula of the American Society of Automobile Engineers, these ratings would be 24 hp. and 27.2 hp., respectively. The standard 47-seater of the Fifth Aveuue Coach Company has a nominal rating of 25 hp.

Because of great increases in wages, it became uneconomical to run a thirty-four-seater, especially as the standard seating capacity of the partly competitive London County Council tramcar is seventy-eight. The company therefore brought out a forty-six-seater, designated Type K, which made such advantageous use of high-strength materials that it weighed only 7,924 lb., or actually less than the thirty-four-seater it was replacing. The seating and passenger interchange features of this bus were also a great advance on the Type B.

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*See ELECTRIC RAILWAY JOURNAL, Oct. 11, 1919.

The lower deck seat layout followed the popular American street car pattern of short longitudinal seats (three per seat) at the rear and 32-in. cross seats on both sides for the rest of the compartment. This arrangement, in combination with a platform 3 ft. 10 in. instead of 3 ft. long, made for faster interchange of entering and departing passengers. The length of this bus from crank handle to rear clearance was 22 ft. 6½ in. and the width over the lower deck 6 ft. 10 in. By the end of 1920, the company already had in operation more than 400 of the 1,000 Type K buses which were ordered.

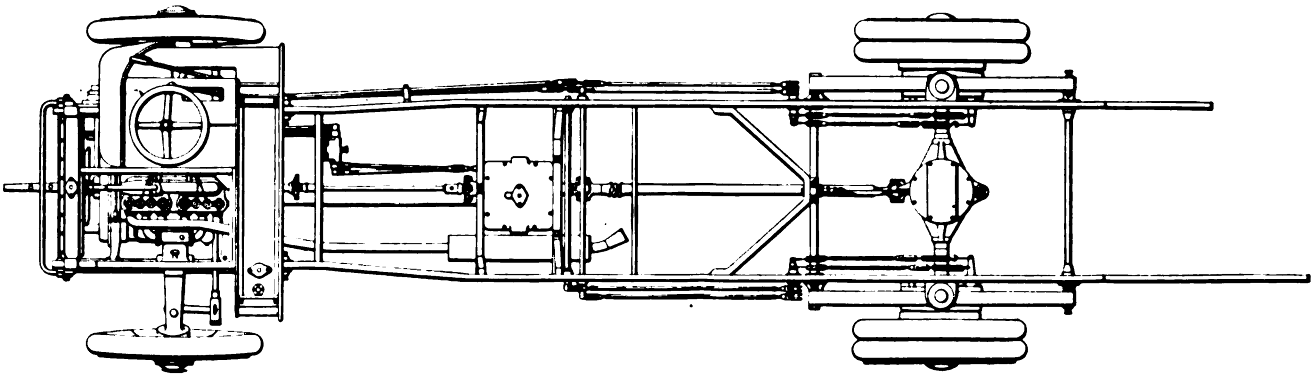
With the coming of still further increases in wages and the demands of growing traffic, the company was obliged to work out a still bigger bus, although the Type K at 7,924 lb. (3 tons 10 cwt. 3 quarters British) empty represented the maximum weight then permitted by London police regulations. However, permission was eventually obtained for the operation of a limited number of the fifty-four-seat Type S buses briefly described in the following paragraph:

In design, materials and general layout the Type S is simply a longer Type K, the increase in seating capacity from forty-six to fifty-four being obtained by an increase in length from 22 ft. 6½ in. to 24 ft. 7 in. Nickel-steel and ash are the principal body framing materials. At first it was planned to make allowances for fifty-seven seats, as shown in the diagram on the previous page. This caused overcrowding, with the result that the seating arrangement was cut down to fifty-four.

The longitudinal corner seats in the lower deck instead of seating only two were made to seat three, the same as in the Type K bus. The long cross seat at the front, where five passengers were to sit riding backward, was taken out. With the final arrangement five cross seats were left on each side, which, together with the end longitudinal seats, gave a total seating capacity of twenty-six on the lower deck. The upper deck seats twenty-eight. The maximum width (over moldings) is but 7 ft. 1 in. The weight of this new type bus when empty is 9,380 lb. (4 tons 3 cwt. 3 quarters British) or 173.5 lb. per seat compared with 172.8 lb. per seat for the Type K forty-six-seater and 237 lb. per seat for the Type B. The accompanying table also shows the fact that the street occupancy per seated passenger has been materially reduced in linear dimensions as follows: Type B, 8 in.; Type K, 5.87 in.; Type S, 5.46 in. At the same time, the width over all has gone up only 3 in., namely, from 6 ft. 10 in. to 7 ft. 1 in. Several score of the 200 Type S buses ordered are already in use.

In comparison with the foregoing figures, it may be interesting to state that the popular forty-seven-seat open-top bus of the Fifth Avenue Coach Company, New York, is very close to London weight standards inasmuch as its weight per seated passenger, including oil, fuel and water, is 190 to 200 lb. The new enclosed upper-deck sixty-passenger bus of the Chicago Motor Bus Company is reported to weigh 12,500 lb., or only 209 lb. per seat.

Although the London General Omnibus Company did not consider it economical from the upkeep standpoint to run Type B buses more than five years and although war conditions did make it necessary to run them seven years more, it is noteworthy that these buses are still in such shape as to be offered for further use in lighter service elsewhere. Consequently, the Associated Equipment Company is selling large numbers of buses overhauled within six months of date of sale at £500 ($2,000 at £1 = $4) each. The chassis alone is being sold at £450 on a 2-ton motor truck rating. From this it is evident that a well-maintained motor bus may have good resale value in a rising market. The estimated cost of a Type K bus as given by Frank Pick, commercial manager of the company, would have been £691 before the war, whereas it was figured at £1,179 in the year 1919. Thus the resale price of the Type B buses cannot be very far from their pre-war cost new.


CHASSIS OF TYPE S BUS

Department of Public Works Progress

THE secretary of the National Public Works Department Association recently filed his report to the executive committee of the association for 1920. This report outlines the progress which was made during the year toward molding sentiment and furthering legislation with a view to the establishment of a National Department of Public Works. The report reviews the history of the two bills which cover government reorganization and include a Department of Public Works, namely, the Jones-Reavis bill and the McCormick bill.

The secretary says the latter "is perhaps the better of the two." It was drawn a year later than the other one. The report also includes financial statements of the association for the years 1919 and 1920.

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

Dallas Issues Guide to Trainmen

THE Dallas Railway, through its publicity department, has issued a "Guide to Dallas," for distribution to its supervisors, inspectors and trainmen, that they may be able to direct passengers to their destinations intelligently. This booklet shows how every street, block number, public building, cemetery, sanitarium, school, church, hotel and railway line in the city is accessible by street car line. The guide was compiled by R. W. Tarrant, office engineer of the line and track department.

New York Central "Keeps Faith"

THE announcement below, appearing in New York Central timetables, has attracted favorable comment. It stresses the fact the company is keeping faith.

NEW YORK CENTRAL LINES
NYC

Keeping Faith

THE cars are coming! From now on travelers will notice a gradual transformation in the long trains which recently have been breaking all tonnage records. They will see an ever-increasing number of bright spots—here and there snow-white refrigerators, glossy-black hopper and gondola coal cars, and glistening-red all-steel box cars.

Already the first section of the new equipment ordered by the New York Central Lines immediately following the termination of Federal control has been received from the shops and has gone into the Nation's transportation service. The balance will be delivered continuously and in increasing volume.

These cars come with the advent of the busiest of fall and winter seasons, at a time when they are needed as never before.

WHEN the Government turned the railroads back to their owners, experts computed that approximately $500,000,000 worth of new equipment was the imperative need of the hour. The New York Central Lines immediately placed their $53,000,000 equipment order, covering 196 locomotives, 265 passenger cars and 11,244 freight cars.

These freight cars, if coupled together, would make a solid train ninety miles long. But measured by the total number of efficient cars added to active service, the repair program of the New York Central Lines this year amounts to several times the new construction.

Crippled freight cars to the number of 59,196 were rebuilt and rendered 100 per cent serviceable up to September 1st. During the same period, "medium" repairs were made to 41,222 additional damaged freight cars.

LAST March assurances were given the shippers and the public generally that no time would be lost in meeting the needs of the service, in rehabilitating existing equipment and purchasing new rolling stock.

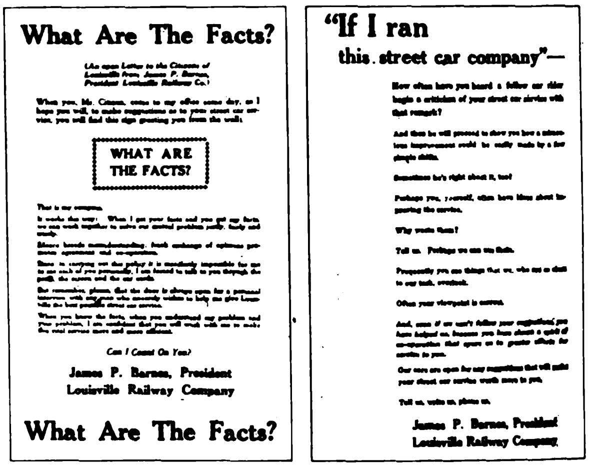
The New York Central Lines are keeping faith.

THE NEW YORK CENTRAL LINES

Michigan Central — Big Four — Lake Erie & Western
Boston & Albany — Toledo & Ohio Central — Pittsburgh & Lake Erie
New York Central and Subsidiary Lines

Louisville Publishes Facts for Higher Fares

THE Louisville (Ky.) Railway, which up to this week was one of the few companies charging a nickel fare, conducted through the newspapers an intense campaign for an increase in fare. It played up in display advertisements the history of the company, its development and what good transport means financially to the city. It also pointed out that of the stock outstanding 98.5 per cent is owned by 82.4 per cent of stockholders, all of whom are citizens of Louisville.



What Are The Facts?

WHAT ARE
THE FACTS?

Can I Count On You?

James P. Barnes, President
Louisville Railway Company

What Are The Facts?

"If I ran
this street car company"—

James P. Barnes, President
Louisville Railway Company

TYPE OF PUBLICITY USED BY LOUISVILLE RAILWAY TO GET FACTS BEFORE PUBLIC

Another advertisement compares the number of rush-hour cars operated in sixteen representative cities, which shows that Cleveland and Cincinnati are the only ones that provide as many or more cars per 100,000 population served.

Two recent advertisements are reproduced in the illustrations above. The text of another advertisement outlining what the road means to Louisville reads as follows:

The Louisville Railway Company was organized in 1889 as a consolidation of the Central Passenger Railway and the Louisville City Railway.

Today it is operating 168 miles of city trackage. The number of cars operated varies from 311 during rush hours to 125 during non-rush hours. It carries annually 80,000,000 cash fare passengers and 30,000,000 transfer passengers.

By construction and purchase of seven suburban trolley lines, with 102 miles of track, the company has brought into intimate contact with Louisville a large and prosperous suburban population.

It gives employment to 1,806 persons (including the Louisville & Interurban), and its annual payroll is $2,250,000.

It purchases each year supplies and materials to the amount of $900,000, most of which is spent in Louisville.

Bonds to the amount of $12,035,000 and notes to the amount of $684,000 have been issued to provide for replacements, extensions, and more modern service. All of these issues have been marketed through Louisville financial institutions.

Seventeen hundred and eighteen stockholders, of whom 1,389 are citizens of Louisville, have invested $11,823,600 that this community may have an efficient transportation service.

The company has served this community for more than thirty years, providing new equipment, as the need arose, and, up to the present time, has been able to make extensions and improve the service to keep pace with Louisville's growth.

The service it will render in the future depends on the measure of co-operation it receives from citizens of Louisville.

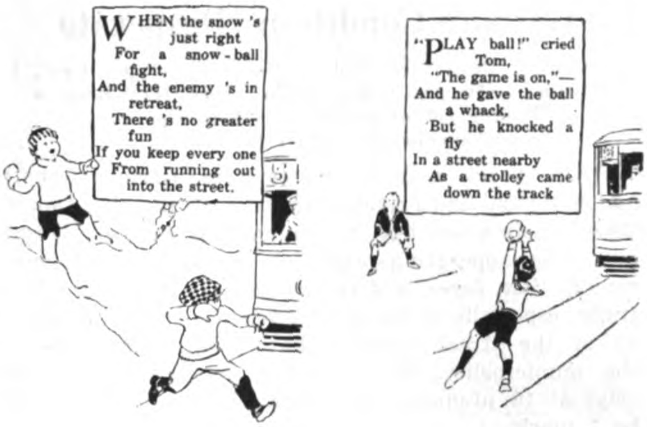
Light Up and Be Seen

A PROMINENT New York advertising man who recently visited Fort Wayne, Ind., made an interesting comment on the advertising value of electric lights as used in generous quantities by the Indiana Service Corporation on its interurban terminal in Fort Wayne. He said: "This company has outlined its terminal in electric lights, and by so doing it makes the station stand out like a fire on a dark night. The location of the station is conspicuous from the main thoroughfare by these lights and is always impressed on the minds of travelers. I think this brilliantly illuminated station is one of the best advertisements for an interurban railway that I have ever seen, and the brilliant lighting is also a real benefit to strangers in the city in that it enables them to find the station quickly. Other service corporations ought to do something of a similar kind."

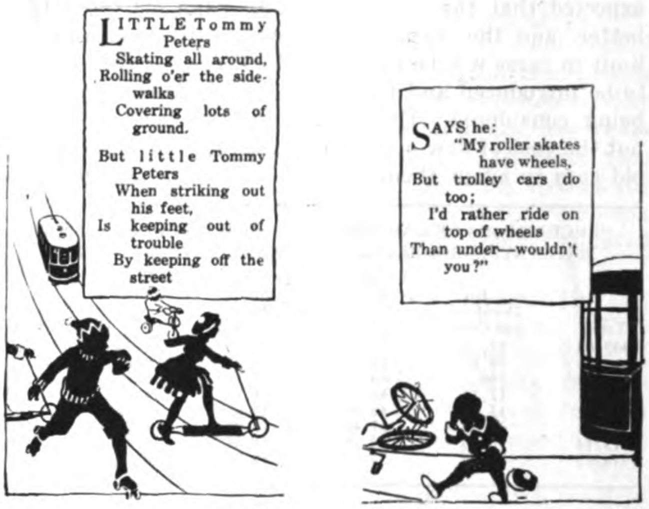
Safety Publicity Among Children

MISS "Safety First" has become quite an established character with the children in Philadelphia in the person of Miss Laura M. Roadifer of the Philadelphia Rapid Transit Company, as has been pointed out already in these columns. The results of her work are notable.

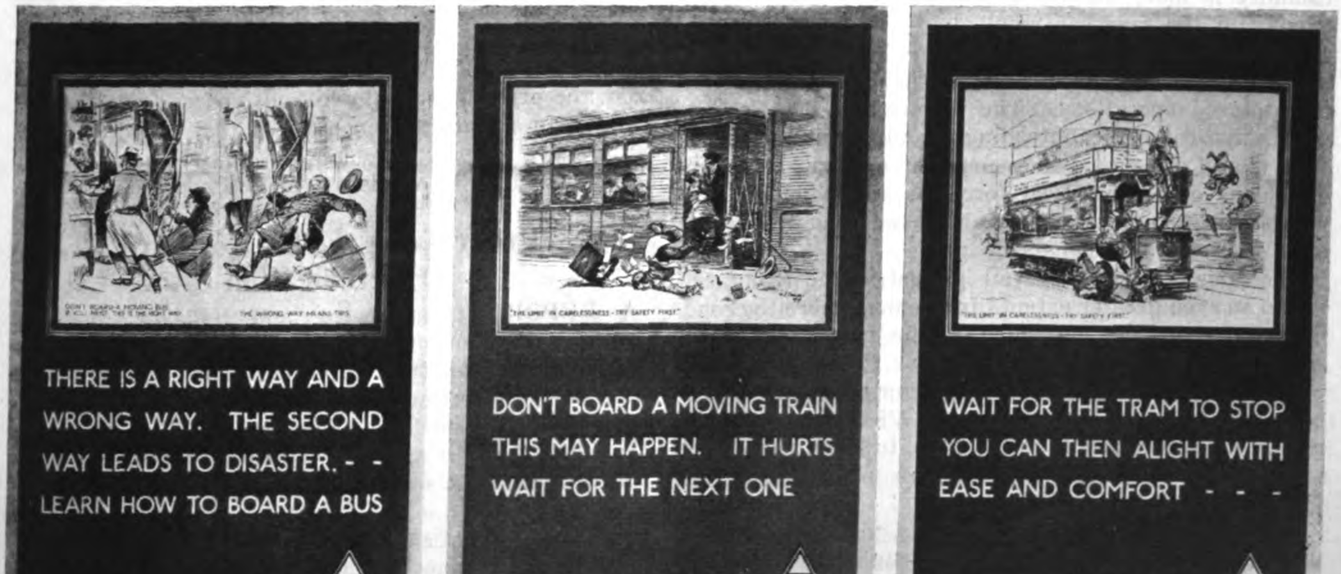
At Christmas time this season the safety department of the Philadelphia Rapid Transit Company issued a children's booklet entitled "A Merry Christmas and a Safe New Year," which was attractively printed in green and red and cleverly illustrated with children's pictures in safe and unsafe experiences with street cars. Two double pages are shown in accompanying illustrations and these are typical of the entire booklet, all of whose text is in children's poetry.


WHEN the snow 's just right
For a snow-ball fight,
And the enemy 's in retreat,
There 's no greater fun
If you keep every one
From running out into the street.
"PLAY ball!" cried Tom,
"The game is on,"—
And he gave the ball a whack,
But he knocked a fly
In a street nearby
As a trolley came down the track

THE PHILADELPHIA RAPID TRANSIT COMPANY USES THIS METHOD TO TEACH CHILDREN THE SAFETY IDEA


LITTLE Tommy Peters
Skating all around,
Rolling o'er the sidewalks
Covering lots of ground.
But little Tommy Peters
When striking out his feet,
Is keeping out of trouble
By keeping off the street
SAYS he:
"My roller skates have wheels,
But trolley cars do too;
I'd rather ride on top of wheels
Than under—wouldn't you?"

Safety Publicity in the British Metropolis


THE WRONG WAY MEANS THIS
THERE IS A RIGHT WAY AND A WRONG WAY. THE SECOND WAY LEADS TO DISASTER. - - LEARN HOW TO BOARD A BUS
SAFETY FIRST
"THE LIMIT IN CARELESSNESS - TRY SAFETY FIRST"
DON'T BOARD A MOVING TRAIN THIS MAY HAPPEN. IT HURTS WAIT FOR THE NEXT ONE
SAFETY FIRST
"THE LIMIT IN CARELESSNESS - TRY SAFETY FIRST"
WAIT FOR THE TRAM TO STOP YOU CAN THEN ALIGHT WITH EASE AND COMFORT - - -
SAFETY FIRST

BY ILLUSTRATION AND SUITABLE QUOTATION THE LONDON TRAMWAYS INSTRUCT IN THE CORRECT WAY TO BOARD A CAR—AND THE PRICE OF CARELESSNESS

German Conditions Desperate

Fares Have Been Increased in Berlin 1,000 per Cent, in Vienna 1,500 per Cent, While There Has Been a Falling Off of Traffic—Receiverships and Abandonments Have Been Many

THE street railway systems in Germany, both municipal and private, are in much the situation of those in America, but in exaggerated degree. Wages and other operating expenses have increased more rapidly than fares, and there has been a falling off of traffic, especially in the smaller towns. In Berlin, where all of the street railways have been taken over by the municipality, the fare has increased from the original 10 pfennigs to 80 pfennigs and will shortly be 1 mark.

At 80 pfennigs, the system which at the 10-pfennig fare used to be prosperous is now losing from 15,000,000 to 20,000,000 marks per month! It is not expected that the mark fare will make matters much better, and the management believes that with it the limit in fares will be reached. A charge for transfers is to be introduced and freight and mail transportation is being considered. One-man cars have been proposed, but the cost of new one-man cars or even of altering the old cars to adapt them for this service is thought prohibitive. There is no doubt, however, that in smaller towns the one-man cars will be adopted to a great extent.

PERCENTAGES OF CAPITAL STOCK OF GERMAN ELECTRIC RAILWAYS, GROUPED ACCORDING TO DIVIDENDS PAID

Year	No Dividend per Cent	Dividends from 0 to 6 per Cent	Dividends from 6 to 10 per Cent	Dividends of More han 10 per Cent	Total
1907/08	21.30	47.60	29.90	1.20	100
1908/09	19.83	51.26	28.07	0.84	100
1909/10	18023	49.41	31.59	0.77	100
1910/11	17.78	46.56	34.70	0.96	100
1911/12	17.71	46.36	34.66	1.27	100
1912/13	15.34	52.46	30.96	1.24	100
1913/14	18.15	49.58	31.87	0.40	100
1914/15	27.96	55.68	16.26	0.10	100

What has been said of Berlin applies more or less to all the street railway systems in Germany. In fact, the calamity is more marked in the provinces, where the raising of the fare has resulted in a much more pronounced decrease of traffic. Many of these roads are already bankrupt, and during the last two months ten have ceased operations. The Government has issued orders that companies intending to shut down must give four weeks' notice and show proof of necessity, but the order has only theoretical force, as all abandonments which have taken place so far have been caused by the most imperative circumstances.

The same difficulties prevail in Austria and Hungary, but to an even greater extent. In Vienna, where the road is operated by the municipality, the fares have been raised from 20 hellers to 3 crowns, or 15 times the prewar rate, yet the system is being run at a loss, which has to be made up from taxes. In Vienna for each of the four years ended June 30, 1916, to 1919, there was a continual increase in passengers per car-mile as follows: 5.4, 6.7, 8.5, 10.2.

Prior to the war the electric roads, taken as a group, paid only moderate dividends, though the supposed regularity of their business tended to give their securities an investment character. The accompanying table, compiled by Prof.-Dr. F. Helm, gives statistics as to dividends of the German roads for the years 1907-08 to 1914-15 inclusive.

There has been a diversity of practice in recent years as to the municipalization of these systems. In some cases the city has taken over the railway entirely. In other cases it has acquired a controlling stock interest. The opposite tendency is shown in Düsseldorf, where a municipal railway has recently been leased to a private company.

In fact, with the concessions which the authorities have obtained from the companies in the past, there seems to be little reason for public operation. These concessions have included free transportation of municipal employees and considerable street paving and street cleaning. In addition, fares and service have been closely regulated. In these circumstances it has appeared wise in most cities to go slowly about taking over the properties, as thereby they run a large risk without hope of much reward.

Obedience to Rules Means Safety

THE current issue of the *Utilities Mutual Protection* contains the following safety story:

A baggage car on a single-track interurban road, running westbound as an extra, was scheduled to meet an approaching passenger train at a regularly scheduled siding. While waiting on the siding for the meet to be completed, the passenger car also scheduled to make the meet pulled into the siding behind the baggage car extra.

It so happened that the extra had not pulled far enough into the siding to enable the passenger car to clear the main line. The motorman of the "regular" blew two short blasts on his whistle with the intention of asking the baggage car to move up a little to permit him to get his car "in the clear."

Instead of interpreting this signal correctly, the crew on the extra thought that it meant that the scheduled "meet" was annulled and pulled out onto the main line for the next siding, with the result that a most distressing head-on collision occurred. Four persons were killed, one of whom was the motorman of the baggage car extra, and forty other persons were injured.

The motorman responsible for the accident had been in the service eighteen years and had a splendid record. Nevertheless, if he had followed the rule not to deviate from the printed schedule without orders from the dispatcher, or if he had remembered that one crew could not receive dispatch orders, indirectly, from another crew, this disaster would have been avoided.

Progress on the St. Gotthard Electrification

A REPORT from Switzerland indicates that the electrification of the St. Gotthard line is progressing favorably and trial trips will soon be made on the Airolo-Biasca section. At Bellinzona the railroad station is being remodeled and other building operations are well along. As soon as these are finished the Biasca-Bellinzona section can also be operated by electricity.

At Bellinzona, also, a workshop for the repairing of electric locomotives is nearly finished. This is an imposing building, 328 ft. long, and it is completely equipped to accommodate from twelve to fifteen electric locomotives on three tracks at one time. Two electric cranes, with a lifting capacity of 80 tons each, are installed.

Letters to the Editors

Car Operation from the Motorman's Standpoint

SAN FRANCISCO, CAL., Feb. 3, 1921.

To the Editors:

You may be interested in the views of a motorman in regard to the prevention of accidents on a street railway. The essentials are a loud-sounding gong, plenty of sand and well-equalized brakes. I have prevented many accidents by having these, and accidents have occurred with me on account of failure of gong, sander or brakes to operate properly. A motorman having an accident on account of a poor gong, shortage of sand or unequalized brakes will not so state in his report because he knows that such a report may be used against the company and at the same time he will be cutting his own throat.

Many motormen will not report defects on the defect card as they should; one leaves the reporting to the next fellow, until possibly the defects are not reported at all. Then again reporting such defects may produce no result. Perhaps the shopman willl get on the car in the carhouse and jump on the gong with such force as to produce a loud sound, saying that it is "O.K." Or if the motorman sets down "unequalized brakes" on the card, the first thing the shopman will say is: "He doesn't know what he is talking about." Probably the shopman will check up the piston-rod travel, then take up a little on the slack adjuster and let it go at that.

It is a pleasure for a motorman to run a car which is in good order, but torture to run one with a poor gong and poor brakes, especially in a congested district with fast running time. From my experience of working for a company with slow running time and another with fast running time, I had fewer accidents in the eight and one-half years with the latter than I had in the one and one-half years with the former. With slow running time one is moping along, his mind maybe a thousand miles away from his work, or perhaps on family troubles, or a sick wife or babies, etc. With fast running time his mind and hands are always ready for action. When passing a cross street he is continuously ringing his gong and is on the lookout for something to pop out in front of him, whereas when going slow he mopes along, not even ringing his gong.

There should also be better co-operation between motorman and conductor in starting their car. You often hear a motorman say: "I have the slowest conductor on the road," but often it is the motorman's fault that the conductor is slow. For instance, take a motorman who only knows how to use two points on the controller (full series and full multiple). Now if an old man or lady, or a lady with a baby in her arms boards the car, the conductor, knowing his motorman, does not dare to give the starting signal until the passenger is safely seated. But if this motorman is in the habit of starting his car smoothly the conductor will feel safe in giving the starting signal when the last passenger is up on the platform, and the car will be promptly under way, saving time, preventing accidents and insuring the good will of the public.

JOHN JOHNSON, Motorman.

Capital Must Be Attracted to Electric Railway Industry

SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION
DALLAS, TEX., Feb. 7, 1921.

To the Editors:

Referring to the article by Hon. Edwin F. Sweet in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 22, it seems to me that certain statements made by him should not be allowed to pass without protest.

In one place Mr. Sweet states: "The principle underlying the street railway industry and all other public utilities should be public service and not private profit. This sounds like a truism. Almost any one would say, 'of course,' yet it is an astounding fact that heretofore and for the most part at the present time, service to the public has been and is subordinated to the pecuniary interests of the corporations owning and operating the street railways." Taken literally, this would leave the inference that "the corporations owning and operating street railways" had, without regard to the comfort, convenience or safety of the public, made full, or even excessive, profits from their operation. The commission and judicial records of the past five years prove conclusively that this has not been the case. These corporations are, at this minute, only asking for a "reasonable return" for the future and do not ask that this be made retroactive during their compelled loss-period.

Regarding forcible arbitration between employer and employed in utility service, Mr. Sweet says: "This recognizes the principle that the primary purpose of street railways is not to afford opportunity for the investment of capital and not to provide work for empleyees, but for the benefit of the public, whose interest is paramount."

This is true, in both theory and practice, in a *publicly* owned and operated utility, but, as a theorem, or a corollary, for the practice of *privately* owned and operated utilities it not only "puts the cart before the horse" but it deprives the cart of any motive power at all. The basic principles and laws underlying all commercial businesses from the peanut stand to the so-called "steel trust" are equally as forcibly applicable to the utility business. Even if the utility is allowed a slightly "*un*reasonable return" on its invested capital it is not best, either for itself or its public, to put its profits back into the business for the purposes above stated. The necessary money for these enforced needs must be "new money," additional and permanent capital, if the general public is to be best served. And such money, like the electric current, takes the path of least resistance; in other words, the path of the least risk, other conditions being equal.

Even in war-time in our country it was not possible to force capital into channels in which it did not ordinarily wish to flow; it took the personal stimulus of patriotism to make it do so. Now capital once more follows that path of least resistance. The fact stares us in the face that without the "primary purpose" of profit to capital invested in the utilities there would be fewer of them and those that were left would not even be able to continue their present admittedly inadequate service.

This is equally true of the other matter which Mr. Sweet discusses, namely, the flow of labor. An attempt to enforce wages or conditions which would be unjust on utility labor, especially on that of the major portion of those employed on street railways, would be very unsatisfactory, and if such an attempt were made the utilities and their service—and consequently the general public—would soon find the evil effects of such "forced arbitration." Labor is not as fluid as capital, and it might be slower in "finding its level," but the inevitable result would be that the utilities would be undermanned, or inefficiently manned.

Any utility owner or operator with any public utility sense at all acknowledges the fact that the public *is* entitled to "100 per cent local" service; that is, to a service which keeps up with, and forestalls the community growth. But the "electric plant" is not a money-tree whose boughs may be shaken at will and dollars drop into the owner's palm. Owners and operators know that, "other things being equal, the right of the public to 100 per cent local service is paramount" but, unluckily for the theory, "other things are seldom equal," capital must be had; it will not come unless the proper bait is used, and that "bait" is a profit commensurate with the risk, for the commercial apothegm of the ages has been "the risk measures the profit."

To give the increased and improved service the public is now demanding, the utility business must have new and abundant capital at reasonable rates of interest or return. To obtain this capital the industry must be made attractive to capital. To make it so attractive the risk and return must be on a par with any other legitimate and successful manufacturing and distributing business in the same community.

It is largely the fault of both consumer and general public that the utility business is, as a whole, in its present condition of financial starvation. It is true that this condition is one where ignorance of the utility business and its financial needs has been, and still is, a great factor in the stand which the public makes. It is equally true that a large portion of this ignorance is the fault of the utility in not only leaving the public unenlightened as to its business and its needs but, also, in persisting in false financing with "major" securities, in trying to lift itself out of the slough of impecuniousness by its bootstraps, but any such recriminations at this time lead us nowhere. "It is a condition and not a theory which confronts us"; the utilities need money; to get it they may have to be less regardless of the theoretical "rights" of the public than that public demands but—they need the money and they need it sc that the public may have those "rights" in full as soon as possible! That's all there is to it and premature insistence on those rights and premature efforts to enforce them will only make the matter worse and put off to a later day that which would come sooner if the general public and its exponents would not endeavor to do the impossible, namely, demand of the utility now that which is financially impossible at this moment and an attempted enforcement of which demand will prevent the granting of that demand now or in the near future.

H. S. COOPER, Secretary.

According to plans of the Bradford (England) Tramways Committee, application will be made to the Ministry of Transport for permission to extend the trolley-bus system in that city, involving substitution of this type of rolling stock for the present street railway cars on certain routes. The plan comprehends the use of the new type of double-deck bus developed locally and a considerable increase in the number of rolling-stock units.

Association News

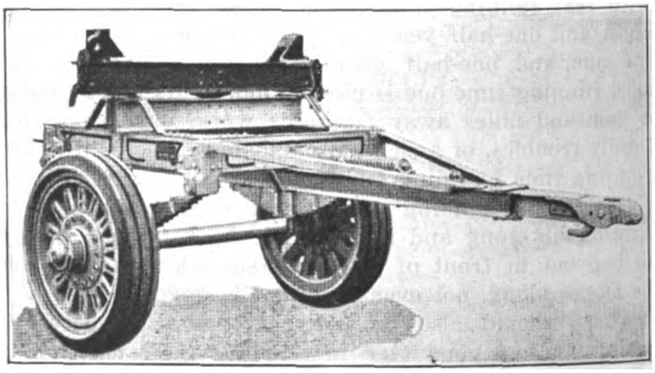
Merchandising Methods Discussed

THE T. & T. Association committee on merchandising of transportation met at association headquarters on Feb. 18, reviewed to some extent the work of last year's committee and mapped out a plan for its report to the 1921 convention. Among those present were J. H. Alexander, Cleveland Railway, chairman; A. H. Ferrandou, Washington Railway & Electric Company; M. B. Lambert, Westinghouse Electric & Manufacturing Company, and E. S. Wilde, Union Street Railway, New Bedford, Mass.

The committee plans to outline, for the benefit of the industry, a number of specific methods that can be used by local companies in merchandising service. These will include plans for education of employees, for advertising in newspapers, on billboards by means of car cards, etc., for direct advertising through addresses illustrated and otherwise delivered before civic bodies and clubs, and for co-operation with national and state publicity bureaus for the dissemination of information for public consumption.

Two-Wheel Trailer Truck

THE Warner Manufacturing Company, Beloit, Wis., has placed a two-wheel heavy-duty trailer truck on the market for the convenience of railways which find it necessary to carry poles, pipes or other material of such a length that they cannot be loaded on standard trucks. The outstanding features of this trailer are the use of a universal ball-and-socket hitch and a swivel bolster. This patented hitch requires no coupling pins. It operates like the shoulder joints in the human body, allowing for all positions of the trailer and the load and eliminating binding in passing over bumps, around corners, etc.



TWO-WHEEL HEAVY DUTY TRAILER TRUCK

The swivel bolsters take care of all side sway and they turn with the load as the truck is rounding corners, so that the trailer wheels will track with the truck wheels. The bolsters are provided with dogs which can be removed quickly if necessary while poles or pipes are being loaded on the truck. The dogs are adjustable in position to accommodate loads of any size. These trailers are made in four sizes, 1¼ tons, 1¾ tons, 2¾ tons and 5½ tons.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Storm and Fire Hit Boston

$400,000 Loss Sustained by Boston Elevated by Destruction of Neponset Carhouse and Cars

Almost on the heels of the announcement by the trustees of the Boston (Mass.) Elevated Railway that the $300,000 deficit of last year might be wiped out in the next six months if the winter should continue as mild as it had been in the early months, a blizzard bringing a 16-in. fall of snow came on Sunday, Feb. 20. Before the storm was over and the streets cleared for vehicular traffic the elevated suffered the most disastrous fire it has had in a number of years, the Neponset carhouse and forty cars being totally destroyed by the conflagration.

COMPANY'S EQUIPMENT IN READINESS

The elevated was well prepared for the storm and early Sunday morning had more than 100 plows operating over the entire system with the result that at no time was any line tied up for more than comparatively short periods. Coming as it did on Sunday, the loss of revenue due to delays of thirty to sixty minutes on various lines was less serious than it would have been on a business day. At no time were the rapid transit lines tied up. On Monday morning all lines were operating on normal schedule except where delays were occasioned by other vehicular traffic using the tracks cleared by the elevated plows.

Although the company probably did not suffer any very considerable loss in revenue, the cost of clearing the snow is expected to cause a very decided setback in the efforts of the trustees to wipe out the past deficits. An unfortunate controversy arose between the city officials of Boston and the company over the clearing of the snow from the streets.

FIRE BREAKS OUT IN CARHOUSE

Mayor Peters charged the Boston Elevated Railway with failure to cooperate with the city in removing the snow from the streets upon which its tracks are laid as required by law. The Mayor issued a statement to the effect that he called the trustees of the elevated into conference and that after some discussion they agreed to make greater effort to secure the removal of the snow over the holiday. The Mayor further stated that the trustees claimed that the financial situation of the company was such that they could not stand the greater expense.

At five o'clock Monday morning a fire, said to have originated in the electric heater of one of the cars, broke out in the carhouse at Neponset, completely destroying the structure. Employees succeeded in running five cars out of the building, but the fire spread so rapidly that the men engaged in the work of rescue were driven out and twenty-three articulated type cars, eight semi-convertibles, one 25-foot motor car, four trailers, two snow plows and two work cars were completely destroyed. Five other cars on storage tracks outside the building were badly damaged but can be repaired.

$400,000 Loss

The loss is estimated at approximately $400,000, but this will be largely covered by insurance. The loss to the company, however, in the use of the cars and the carhouse cannot be estimated at this time. Before the fire was even extinguished, General Manager Edward Dana was on the scene and had emergency crews clearing the loop track and had established an emergency shuttle service between Field's Corner and Neponset.

The fact that the fire started before the streets had been broken through after the heavy snow is believed to have been the reason for the inability to check the fire before it had gone so far. Several pieces of the city fire apparatus were stalled in the snow drifts and never succeeded in reaching the fire.

Home Rule in Arkansas

Public utilities in Arkansas are vitally affected by the Emory-Walls bill. This bill has been passed by both houses of the Arkansas Legislature now in session and has been signed by Governor McRae. It repeals the act of 1919 which abolished the Arkansas Railroad Commission and substituted the Arkansas Corporation Commission. In repealing this act, provision is made for a new Railroad Commission to which certain powers formerly exercised by the Corporation Commission are transferred.

The new commission will have general jurisdiction over all common carriers, railroads, express companies, car companies, freight lines, toll bridges, street railways, electric and other interurban lines, telegraph and telephone companies, etc. No jurisdiction is vested in the commission, however, over any matter of rates or regulations of public utilities operating within a municipality, such jurisdiction being expressly conferred upon the municipality.

Procedure is prescribed whereby municipalities may assume ownership and direct operation of utilities after an election by the people. Provision is made for appeals from the rulings of any municipality in regard to rates or other question to the Circuit Court.

Detroit Campaign Started

Voters Solicited by Private Company to Discard Municipal Ownership for Service at Cost

The initiative petition, in the form of an ordinance to authorize and provide for the operation of one complete unified railway system in Detroit, Mich., under service at cost and reserving to the city the right to purchase or lease the lines, has been filed in the office of the City Clerk by Elliott G. Stevenson, attorney for the Detroit United Railway.

The proposed ordinance has been approved as to form by the Corporation Counsel and has been submitted to the Council by the City Clerk. The ordinance will be submitted to the voters at the election on April 4, and a copy of the settlement plan as set forth in the ordinance is being mailed by the Detroit United Railway to every registered voter in the city of Detroit.

Accompanying the complete copy of the proposed ordinance which is being sent out to the voters is an analysis of it, intended to enable all the people to note how the ordinance meets the various popular demands. The demands of the public are set forth as follows:

1. That the entire street railway system of Detroit be one single system, operated as such, with no stub ends belonging to the interurban lines in portions of the city which have been annexed from time to time, and that the lines in Highland Park and Hamtramck be made part of the Detroit system.
2. A reasonable rate of fare, provided for a continuous ride between any two points in the city.
3. That the rate of fare shall be the lowest possible, sufficient only to give all the service desired by the people and paying only the legitimate and proper costs of that service.
4. City control of routes, frequency of service, heating and ventilation and the like.
5. Prompt extensions of lines as the public needs demand them.
6. That the privilege of municipal purchase shall be reserved to it, in case it desires to exercise it in the future.
7. Full knowledge of street railway finances.
8. Street railway development without continued quarrel.
9. That plenty of capital be available for extension and development.
10. The building of certain lines that by their very nature are piecemeal in their service and by themselves cannot be made to render transportation for all the people throughout the city, has been undertaken by the public.

The analysis explains fully how each of the demands of the public is met by the provisions of the ordinance. With respect to the piecemeal lines, it is stated that the ordinance requires the Detroit Service-at-Cost Railway to purchase these lines, if the city so directs, thus relieving the city from guaranteeing its tax money in a piecemeal undertaking.

The ordinance must receive the approval of 60 per cent of the voters to be adopted.

New Akron Franchise Rejected

Railway Refuses to "Be a Party to Fooling the People," Declaring Results Under Grant Are Impossible

An unusual situation with reference to a new franchise has developed in Akron, Ohio. Following rejection of the franchise by the Northern Ohio Traction & Light Company, the Council defeated the measure. The measure was then reintroduced at a subsequent meeting and passed final reading. Still the company refuses to accept the ordinance, declaring that when a new contract is made the people will expect results, that results cannot be obtained under the franchise as passed, and that "the company will not be a party to fooling the people."

THE proposed franchise is based on the service-at-cost plan. The measure, a summary of which appeared in the ELECTRIC RAILWAY JOURNAL for Nov. 20, 1920, page 1072, as originally presented in Council, was satisfactory to the company. It was amended in Council.

TENTATIVE FRANCHISE ARRANGED

Following a strike of the trainmen on the Akron City lines last July, the company entered into a franchise agreement at a conference participated in by leading citizens of Akron, representatives of the city, including the city administrator, and company representatives. This agreement was to form the basis of a new franchise. Upon the strength of it the company granted its trainmen an increased wage and they returned to work. The agreement provided:

1. That the valuation of the system be fixed by arbitration.
2. That the initial rate of fare be 5 cents until Dec. 15, 1920, then a 6-cent fare; the 6-cent fare to be considered as the basic rate of fare for the entire life of the ordinance.
3. Minimum rate of return on the valuation fixed by arbitration board to be 7 per cent with an increase of ¼ of 1 per cent for each reduction of one step in the fare below the 6-cent rate.
4. If money for capital expenditures cost more than 7 per cent the difference be charged to operating expenses.

This agreement was put in writing and signed July 19, 1920, by F. H. Lyder, William H. Kroeger and George C. Jackson, members of the public utility committee of the Council. It was accepted on July 23 by A. C. Blinn, vice-president and general manager, for the company.

CITY EMPLOYED EXPERT

The city employed E. E. Brownell, a traction expert, and the writing of the new contract began in August. It was submitted in Council on Nov. 9, 1920. Then the politicians got busy. Something like fifty or sixty amendments were offered and some adopted by the Council. Most of them were unimportant, but two changes, one submitted by Mayor Beck and another by Councilman Jackson, a member of the committee signing the original agreement, struck at the very heart of the contract—valuation and rate of return.

The Beck amendment provided that in making the valuation only original installation cost, less depreciation, should be considered by the appraisers. The Jackson amendment provided for a sliding rate of return with a maximum of 8 per cent when fares were 4 cents and 4 per cent when fares were 8 cents.

Before the ordinance came up for second reading Mr. Blinn wrote a public letter refusing to accept the franchise if passed. When the roll was called on final passage Dr. F. H. Lyder, chairman of the utility committee, made public the agreement between the city and company, charged double dealing and by voting no killed the ordinance.

The chief administrator, recognized as a political boss, had the measure reintroduced, "lined up" his followers and on Feb. 15 put the ordinance through final passage by a vote of five to four.

The company and business men who attended the July conference openly charge double dealing on the part of certain city officials, and the public has been informed of all the facts. The *Beacon Journal*, recognized as the administration paper, has pointed out the folly indulged in by the Council and insists that "the people want the matter settled and will accept a franchise based on justice and good business principles." It adds that "the company is objecting to the method of valuation, and we think rightly so." The *Times*, an anti-administration paper, has denounced the city administrator and Council for not settling the question and for what it calls "double-crossing the company and public." The *Press*, opposed to any franchise, is saying nothing.

PUBLIC DEMANDS SETTLEMENT

While all this is going on the city has become thoroughly aroused over the situation. The car riders and builders want the railway system more thoroughly developed. The housing situation in Akron is anything but good, and a committee of the Chamber of Commerce has been working for months on the question. This committee found itself confronted with the fact that the only hope of bettering conditions was to secure railway extensions.

The limit has been reached as to the distance workers will walk to the car lines. Buses were established in some sections, but for the most part they have given up the effort, with the result that there is crowding along or near the car lines.

The old franchise provides for the sale of tickets at six for a quarter, a ten-minute service on all lines from 5 a.m. to 10 p.m. and a twenty-minute service from 10 p.m. to midnight with no service after midnight. The Council granted the company a temporary 5-cent rate. The service furnished is the best in the history of the city, a three-minute headway being maintained on many lines.

The company is also maintaining service after midnight, more than fulfilling the terms of its contract at all times. Many new cars have been purchased and put into the service and there is a general feeling of good will toward the company.

The company agrees that development is necessary and wants to make the extensions, but it declares it cannot unless the contract is such as will permit of the necessary financing—and the people generally agree. The politicians, however, say no.

Seattle Case in Courts

Stone & Webster Demand Payment of Interest and Installment of Principal Be Made

A. W. Leonard, president of the Puget Sound Power & Light Company, Seattle, Wash., representing Stone & Webster interests, on Feb. 21 filed two suits in the United States Court at Seattle. One complaint petitions the court to prevent the city treasurer, city comptroller and city of Seattle from using any portion of the gross revenues of the municipal street railway system, purchased from Stone & Webster, for any other purpose until after payment has been made of interest and installment on the principal of the $15,000,000 of bonds issued by the city to Stone & Webster interests when the city took over the railway and to compel specific performance of the contract. The other suit seeks to restrain taxpayers or any one else from prosecuting action in the Superior Court that would force the city to breach its contract and default the bonds.

Judge Jeremiah Neterer and Judge Edward E. Cushman of the United States Court signed a temporary restraining order, returnable on Feb. 28, enjoining the taxpayers from taking action in the Superior Court to prevent the payment of interest and principal. Stone & Webster interests represented in their complaint that they had not been made a party to action now pending in King County Superior Court and therefore could not protect their interests. The city of Seattle's motions and demurrer in the taxpayers' suit to protect the general fund from invasion by the railway is pending befor Judge J. T. Ronald, in the Superior Court.

The motions to be disposed of are to require the taxpayers to state their separate causes of action and to require them to cite the Puget Sound Power & Light Company as a co-defendant with the city. The demurrer questions the jurisdiction of the court, and raises other technical objections to the proceedings. With Judge Ronald's opinion handed down, main action in the Superior Court will be taken up with argument on the regular "show causes" calendar.

In a suit filed Feb. 11 in the King County Superior Court the city of Seattle, Wash., has been enjoined from setting aside any receipts from the municipal railway to pay interest on the $15,000,000 of bonds issued in payment of the railway property. The restraining order was issued by Judge King Dykeman on the plea of fourteen prominent business men and taxpayers.

The order is directed against the city and City Treasurer Edward L. Terry and City Comptroller Harry W. Carroll. It is action counter to this suit that has now been brought by Mr. Leonard.

NEW MOVE EXPECTED TO FORCE REVIEW OF TRANSACTION

The action prevents the piling up of money in the special interest fund, from the revenues of railway, for the benefit of the bondholders. It is expected that the new move will force a review of the entire transaction in the light of the facts as developed during the period that the municipality has been operating the lines.

The complaint reviews the transactions leading up to the acquirement of the property by the city, and quotes voluminously from the ordinances passed by the city.

The present fare is declared "as high a rate as is practical" and the assertion is made that "at the time of the transfer the roadbed, tracks and rolling stock were in a depreciated, rundown and out-of-repair condition."

The diversion of money from the general and other funds for the payment of interest on the utility bonds of the railway system is attacked as illegal.

Muddle Results from Ousting of New Jersey Commissioners

As a result of the decision of the New Jersey Court of Errors and Appeals on Feb. 15, sustaining the judgment of ouster issued by Governor Edwards against the members of the Public Utility Commission, the state will continue without a utility board until the Senate confirms a new board nominated by the Governor, or the Legislature enacts a new law creating a new commission. The ousting of the commissioners ends a long and bitter fight against the board. Removal charges against members of the board were brought during the term of Governor Runyon. After a hearing he dismissed the complaint on the ground that the case against the board was not proved.

The whole utility question was an issue at the last general election in New Jersey. It was on the charge made by Jersey City of misconduct in office and neglect of duty that Governor Edwards dismissed the entire board. The outsted commissioners appealed the Governor's judgment to the Supreme Court, which sustained the Governor. An appeal was then taken to the Court of Errors and Appeals.

Senator Johnson in New York Fight

Retained to Represent City Before the Legislature—Important Constitutional Questions Involved

Hiram W. Johnson of California has been retained by the city of New York, through Mayor Hylan, as special counsel to assist the city administration in looking after its rights in connection with the transit relief legislation introduced at Albany at the behest of Governor Miller. Senator Johnson has accepted the retainer in what he terms "the old, old fight with special privilege and exploiting corporation greed." The announcement of the appointment, made by Corporation Counsel O'Brien, was the most important news development in the transit fight in the last week.

IN VIEW of the backing which Senator Johnson has received from the Hearst papers in the past the impression was quick to spread that Hearst had had a hand with Hylan in securing Senator Johnson as adviser. This the Hearst papers deny. Many there are, however, who see a political plot with deep motives in the retention of Johnson, the Republican, former Progressive and arch enemy of "special privilege," as he is wont to term it, to fight the Republican Governor of New York.

Mr. Johnson in accepting the retainer is the old Johnson, the Johnson who drove the Southern Pacific out of politics in California. He said that he knew the "money power" would be arrayed against him on the other side, but "we are used to that." He expects to "go to the bat in this case," as he terms it, at the public hearing at Albany on March 2.

It was Hiram Johnson who drove the Southern Pacific Railroad out of politics in California. It was he who at San Francisco stepped into Heney's place as prosecutor when the latter had been shot in court in the graft trials and then brought about the conviction of Abe Ruef, San Francisco's labor Mayor. It was he who spurred the California Legislature into extending and widening the scope of the California Railroad Commission, now one of the most progressive and fearless bodies of its kind in the United States. And so it goes. Johnson may have an eye to the main chance, but those who take issue with him know before they are through that they have had a fight on their hands.

The impression is wrong that Johnson was the sponsor of the San Francisco Municipal Railway. He did not figure in the establishment of that line. This was a hobby of Mayor Ruef during his first administration in 1913, when the city took over the old Geary Street Railroad at the expiration of its franchise, scrapped the equipment and built a new line. Johnson was never identified with the enterprise, although he did lend aid to it as Governor.

Senator Johnson's formal acceptance came in the form of the following telegram to the Corporation Counsel:

> I am very glad to undertake the employment as special counsel in the endeavor to protect and preserve the city's rights from the assault now being made upon them. I congratulate the Mayor and you and the other city officials upon the valiant struggle you are making.
>
> I recognize the odds in the contest and the tremendous opposition and difficult obstacles which must be encountered, but it's the old, old fight with special privilege and exploiting corporation greed on the one side and the simple justice and inherent rights of the mass of the people on the other. You are fighting the good fight and I am delighted to be a part of it with you.

In explaining the retention of Mr. Johnson, the Corporation Counsel said:

> Inasmuch as the traction interests intend to have abrogated the 5-cent fare contracts existing between the city and the traction corporations by legislative enactment at Albany, which has for its purpose, by nullifying and setting aside contracts at will by State officials, an increase in fare, extracting between $60,000,000 and $100,000,000 yearly out of the pockets of the people; and, inasmuch as the abrogation of solemn contracts, against the people's interests, and in favor of powerful corporate interests, goes to the very vitals of constitutional government, and has a bearing on every contract made in the United States under our constitutional form of government, it behooves the Mayor and the Corporation Counsel of this city to use every means at their command to uphold the solemn agreements made with the people of this city by the traction interests, and protect the people from being compelled to pay additional millions yearly to these interests.

The Governor's comment was:

> Is there so little talent in support of their side of the proposition that they have to go to California for it? I thought they were opposed to outsiders interfering.

Several of the newspapers, in their editorials, reiterated this question.

Sponsors of the legislation fostered by Governor Miller announced on Feb. 21 that the new measures would be amended so that no fares would be increased pending adoption of the plan for a unified city-owned transit system in New York.

Nineteen States to Attack I. C. C.'s Control of Intrastate Rates

Nineteen states will join with Wisconsin in challenging before the Supreme Court on Feb. 28 the right of the Interstate Commerce Commission to regulate state railroad rates under the transportation act.

In a formal statement the Attorney Generals of the states said it had always been a constitutional right of the people of the several states to control purely state traffic, adding that this principle had been upheld by John Marshall and uniformly admitted by all the courts up to this time.

The provision of the transportation act that the Interstate Commerce Commission fix a return without regard to the value of service rendered is "not only economically unsound, but it is violative of fundamental law," the statement declared. Under the group plan of fixing aggregate values, it was contended, weak roads had the right to earn on their own value and on the value of the other roads as well.

Safety Car Invades Chicago

Safety cars made their bow to the Chicago public on Feb. 18. On that date the Chicago Surface Lines began operation with three "safeties" on West Division Street, a 2-mile route, where they were added to the service given by an equal number of double-truck cars. This is a temporary arrangement, it being planned eventually to operate the entire line with safety cars. The West Division Street line is comparatively new and serves a fast growing population. The traffic is mostly short haul and it is expected that a number of people in that vicinity who have been walking to their destinations will ride with the service increased to this point. The Surface Lines has ten standard safety cars, but schedules have not been prepared for the complete installation of equipment of this type.

Wages Increased in Louisville

The Louisville (Ky.) Railway has announced an increase of 3 cents an hour in the wages of all employees, effective simultaneously with the increase in fares, referred to elsewhere in this issue. Last October the company told the Welfare Association plainly that increased wages were impossible without increased fares. The men remained loyal, and the company has kept its promise of increasing wages if fares were increased. J. P. Barnes, president of the railway, has stated that the fare case will probably be fought through the higher courts, but he felt that the increase would stick. If it does not wages will have to be readjusted. In the meantime 1,400 men are affected by an increase of about $165,000 annually in the payroll. Present wages paid the men range from 41 to 45 cents an hour.

City of Chicago Renews Attack

On Feb. 17 the city comptroller of Chicago refused tentatively to accept a check for $87,090 offered by the Chicago Surface Lines to settle a balance of disputed bills including payment for cleaning the right-of-way. The city law department advised the comptroller not to accept the check for the present because by doing so he would recognize the existence of the ordinances which the city claims have been canceled by the action of the companies in accepting a rate of fare higher than 5 cents. Under these ordinances the companies are required to pay the city about $348,000 a year for street cleaning which is to be done by the city. The question has been raised as to who would remove snow after a big storm in the event that the city persists in such refusal. As has been indicated previously in the ELECTRIC RAILWAY JOURNAL Mayor Thompson has called upon Bion J. Arnold to relinquish his title as chairman of the Board of Supervising Engineers on the ground that the Surface Lines' franchises have been canceled and the board has no authority to function.

News Notes

Wages Reduced on Michigan Railway.—The Michigan Railroad, Jackson, Mich., on Jan. 1 reduced the wages of line foremen from $175 to $150 a month. The wages of other linemen were cut $20 a month, from $150 and $140 a month to $130 and $120. The wages of all shop men were cut 10 cents an hour, and a similar reduction made for all freight men. On Nov. 15, 1920 all track laborers were reduced in pay from 65 cents and 60 cents an hour to 40 cents an hour.

Official Denial of Wage Reduction.—H. B. Titcomb, vice-president of the Pacific Electric Railway, Los Angeles, Cal., has published a statement in refutation of persistent rumors to the effect that the Pacific Electric Railway was considering a reduction in the wage scales of the working forces. He said: "We have not considered making any reduction in the wage scale of any of the employees of the Pacific Electric. Neither is there any basis for a report that we are planning any reduction other than normal fluctuation in the working force."

Further Motor Bus Service Proposed.—Plans for the establishment of additional motor bus lines in Chicago were made known recently through a petition filed before the Illinois Public Utilities Commission by the Depot Motor Bus Lines, Inc. This concern has for several months past been operating a few buses between one of the downtown department stores and the Union and Northwestern railway stations. It is now proposed to establish seven main routes which would serve districts on the far south side, the west side and the stock yards territory. W. T. Gridley is vice-president and general manager of the corporation. No date has been set for hearing on the petition. The Chicago Motor Bus Company has been operating since 1917 on the north side and has been delayed in its plans to extend service to the south side.

Commission Insists Its Own Act Shall Be Investigated.—No action has been taken on a bill introduced by Delegate J. B. Hilleary, of Upshur County, and upon measures of a similar nature introduced by other members of the Legislature of West Virginia growing out of public dissatisfaction with increases allowed to public utilities and particularly gas companies, but a committee has been named by the Legislature to inquire into the manner in which the Public Service Commission has discharged the duties imposed upon it by law. The committee, however, was named in a resolution adopted upon the insistence of the commission that its official acts be reviewed by a committee of the Legislature, that request having been transmitted to the Legislature by Governor Cornwell.

Eight Die in Accident.—A head-on collision between a Bridgeport and a Shelton electric car near Shelton, Conn., on Feb. 22 resulted in the death of eight persons, among them the motorman of the Bridgeport bound car. Many severely injured were removed to a hospital and several suffered minor injuries. The accident occurred when the two cars running at high speed met 100 ft. south of a 90 ft. trestle. With windows smashed and glass flying in all directions a panic ensued. Men and women who were able to extricate themselves from the wreakage fell down the adjacent embankment. The disastrous trip was the first over the Bridgeport-Derby route since the block caused by the recent snowstorm. It was said that when the cars telescoped a can of gasoline on the Bridgeport car exploded.

Court Demands Retraction.—Comptroller Charles L. Craig of New York was recently found guilty of contempt of court by United States Judge Julius M. Mayer. This decision was reached as a result of a communication written on Oct. 6, 1919, by the comptroller to Public Service Commissioner Nixon in which the former made a statement to the effect that federal jurisdiction blocked access of city authorities to reviewing reports and statements of the Brooklyn Rapid Transit Company and the New York Railways receiverships. A few days after the writing of the letter United States Attorney Francis G. Caffey filed a charge against the comptroller. The court considered the charge a grave one. It said that "the undisputed testimony shows that neither the defendant nor any official or representative of the municipal government ever applied directly or indirectly to Receiver Garrison, Hedges or Trustee Sheffield to have access to any papers, documents or information." Judge Mayer will allow reparation in the form of a retraction filed with the clerk of the court.

Program of Meeting

Oklahoma Utilities Association

The third annual convention of the Oklahoma Utilities Association will be held at the Huckins Hotel, Oklahoma City, Okla., on March 8, 9 and 10, 1921. It is expected 300 or 400 delegates and visitors will attend and to have a large number of exhibits.

Noted speakers will be on the program. Among those who will address the convention are:

H. J. Gordon, publisher *Public Service Magazine*, Chicago, Ill.; H. P. Wright, president H. P. Wright Investment Company, Kansas City, Mo.; Paul P. Haynes, member Indiana Public Service Commission; C. C. Deering, secretary U. S. Independent Telephone Association, Des Moines, Ia. There will be a banquet on the night of March 9.

Financial and Corporate

Winnipeg Earnings Improve

Net Profit of $600,000 Best Showing Since 1914—Management Complimented on Excellent Record

Gross earnings of the Winnipeg (Man.) Electric Railway for the year ended Dec. 31, 1920, show an increase of $949,221 over the previous year. Notwithstanding the large increase in wages and other operating expenses, the net income shows an increase for the year of $498,720. After paying all fixed charges and making provision for depreciation amounting to $201,050 the company made a net profit of nearly $600,000. This is substantially the best showing of any year since 1914.

EARNINGS SPEAK FOR THEMSELVES

The statement of earnings of the company as made public at the annual meeting on Feb. 9 follows:

Gross earnings from operations		$5,233,700
Operating expenses, before charging depreciation		3,428,897
Net operating revenue		$1,804,803
Miscellaneous income		76,700
Income available to meet fixed charges, etc.		$1,881,503
From which the following deductions are made:		
Interest charges on debenture stock, bonds, gold notes, etc.	$716,214	
Extinguishment of discount on securities	26,786	
City percentage and car license taxes	181,249	
Taxes	127,239	
Miscellaneous non-operating expenses	2,942	
Other income deductions	30,495	1,084,928
Net income as shown on accounts submitted herewith, excluding depreciation		$796,575
Deduct:		
Depreciation		201,050
Net income transferred to surplus		$595,525
Surplus brought forward from 1919 as adjusted		1,314,420
Net income for year transferred		595,525
Dividend on 7 per cent cumulative preferred stock		4,444
Sinking fund appropriation		60,000
Surplus carried forward		$1,845,501

In July a board of arbitration awarded increased wages to the company's employees retroactive to May 1. As a result of the company's application to the Manitoba Public Utilities Commission increased rates were granted and an appraisal of the physical value of the company's property was arrived at. The increased rates and fares authorized assisted in offsetting the increased operating expenses which had resulted from the rising costs of material and labor.

In April last the company's south Main Street carhouse, together with twenty-one cars and other equipment, was destroyed by fire. A new fireproof, fully modern carhouse has been erected on the site of the old one and all rolling stock destroyed has been replaced. More than $300,000 was recovered from insurance.

The company made improvements in all departments during the year to the extent of more than $900,000. This sum included expenditures for replacing property destroyed by fire.

For the purpose of retiring as far as possible the company's floating liabilities a new issue of preferred and common shares was authorized. This stock is now being placed on the market.

FUTURE OUTLOOK VERY BRIGHT

A. M. Nanton, president of the company, presented the report at the annual meeting on Feb. 9. The property is in direct operating charge of A. W. McLimont, vice-president. When Mr. McLimont took over the property in October, 1917, a stupendous task confronted him. Jitneys were on the streets, the property was run down, the company was in bad public repute, franchise fares existed and there was considerable litigation pending between the company and the city. At the present time the jitneys are off the streets, almost the entire property has been rehabilitated and negotiations are proceeding with the City Council with a view to effecting a service-at-cost franchise, toward which public sentiment is very favorable.

The system at Winnipeg comprises 112 miles of track, with more than 306 cars.

Reorganization of Bus Companies Completed

The reorganization report on the American Motor Bus Corporation and the Chicago Motor Bus Company, submitted by Harold Almert, consulting engineer, Chicago, has been adopted by the bankers, and the business of the two concerns taken over by the Lake Shore Motor Bus Corporation, a holding company.

The American Motor Bus Corporation, the manufacturing concern, has resumed manufacturing with an initial order that will keep the factory operating at full capacity for the year 1921.

The Chicago Motor Bus Company, which operates a fleet of motor buses over the boulevards of the north side of Chicago, serving a territory which cannot be reached by the surface and elevated railways, has obtained an amendment to its franchise permitting the operation of the new enclosed top bus. The company will increase its service on the north side and shortly start operation on the south side, together with through routes between the north and south sides.

Chicago capital has taken over the entire interest of New York capital, which retires from the field.

Mr. Almert has been retained as consultant by all three companies.

$8,559,776 Grand Rapids Value

Reproduction Cost, Less Depreciation, Fixed at This Amount in Franchise Case

After many months of constant work the valuation of the property of the Grand Rapids (Mich.) Railway has been completed. The inquiry was conducted for the purpose of establishing a rate basis for fare in a new service-at-cost franchise to be offered the company as a temporary operating arrangement.

THREE SETS OF FIGURES PRESENTED

The valuation has been completed on a three-fold basis, historic, five-year average and replacement. These three bases were arrived at by co-operation between the company's engineers, headed by W. L. Hagenah, and the city's engineers. A short conference was held on Feb. 17 and the going value decided upon. The reports were then presented to the City Commission.

The historic value of the company's physical properties was $4,468,360 without depreciation. With depreciation it was fixed at $3,610,526. To these amounts must be added a material and supplies account of $131,812 and a working capital of $107,040. The figures of these items are the same for all three valuations. The going concern value, which is not admitted by the city as belonging in the appraisal for rate making purposes, is placed at $357,469 in the historic valuation. Property not used and useful and miscellaneous property is listed at $12,200. This makes the total historic valuation of the railway company's lines without depreciation $5,076,881 and depreciated, $4,219,047.

The five-year average valuation, from 1915 to 1919, of the physical properties is $6,718,463 without depreciation and $5,385,102 with depreciation. After adding the fixed material and supplies and working capital together with the going concern valuation of $537,477 and the physical property useful but not used, the total five-year valuation of the company is $7,506,992. Depreciated this figure stands at the sum of $6,073,631.

DEPRECIATED FIGURE $8,559,776

The reproduction valuation, which the company insisted would be taken together with the other valuations, is $10,591,414 without being depreciated. This valuation includes the physical property of $9,574,409; the fixed material and supplies and working capital and a going concern value of $765,953, together with the $12,200 item for extra property on hand. Depreciated this figure stands at $8,559,776.

As indicated at the outset of this article Grand Rapids is working toward a trial of service-at-cost for a year, with a view to its permanent adoption. The situation there in connection with the negotiations along these lines was reviewed briefly in the ELECTRIC RAILWAY JOURNAL for Jan. 29, page 235.

Prompt Action Urged

Ontario's Railway Board, Operating London Street Railway, Sees Need of Aid for Company

The Ontario Railway & Municipal Board, which assumed operating control of the London (Ont.) Street Railway on June 15, 1920, after two strikes within a brief period had left the city without service for thirteen days, has reported as follows for the year ended Dec. 31, 1920:

	Operation By L. S. R. to June 15	Operation By O. R. B.	Total for 1920
Gross earnings	$225,205	$299,523	$524,728
Operating expenses:			
Maintenance	41,933	61,209	103,143
Transportation	153,170	198,243	351,413
Totals	$195,104	$259,453	$454,557
Net earnings	$30,100	$40,070	$70,170
Interest on bonds and loans and taxes	17,034	20,386	37,421
Balance	$13,066	$19.648	$32,749
Depreciation, invested in bond redemption	$13,768	$19,500	$33,268
Net deficit of company	$702		
Net income of railway board	....	$183	

In urging an early settlement of the higher fares dispute the board reminds the City Council as follows:

> It is not contemplated by the act under which the board is in possession of the railway that the board's possession and operation would be a permanent solution of the difficulties under which the city's transportation system labors. In the very nature of things the board, in view of the statutory limitations on its powers and its inability properly to finance such an undertaking, is unable adequately to provide for the inevitable wear and tear and depreciation of the plant; much less is it able to meet the probable demands for the improved service and extensions certain to arise in a growing community like the city of London.

The board emphasizes the "urgent need for prompt action looking to some workable solution." It is shown that the two strikes last June cost the company $2,717 and the strikers $12,870 in wages.

The company formerly raised substantial amounts of new capital from year to year to provide for improvements, but when dividends ceased such financing was impossible. A statement shows that no new capital has been secured since 1918. The effect of the present condition upon expenditures for improvements was noted at once. In 1920 none were made.

Secretary-Treasurer Leonard Tait's analysis asserts:

> The question of whether or not the road is privately or municipally operated in the future will be an ever-present one. Municipal ownership is urged by some as a panacea against increased fares. It does not matter by which plan the railway is managed, the cost of the service must be found either from those who use the cars or by taxation.

Between 1915 and 1920 wages increased $147,133 and other operating expenses $12,757, a total of $159,891. The total increase in earnings in the same period fell $34,021 short of this amount. The statement, it is pointed out, "shows conclusively the difficulty in operation to be a question of wages."

In an endeavor to keep operating costs down the Railway Board cut the service, and the year's car mileage decreased to 1,765,242 miles as compared to 1,918,207 in 1919. Gross earnings per car-mile advanced from 20.49 cents in 1915 to 29.73 cents, but net earnings decreased from 5.35 cents to 3.98 cents. Passengers carried totaled 10,801,531 in 1915, 13,689,732 in 1919 and 13,788,209 in 1920.

Foreclosure Step Taken

As a further step in the reorganization of the United Railroads of San Francisco, Cal., the Union Trust Company, as trustee, has commenced foreclosure proceedings against the railway in the Superior Court. This move was made in accordance with the working out of the reorganization plan recently approved by the State Railroad Commission. The reorganization of the United Railroads should be completed and the new securities issued within sixty days, according to Frank D. Madison, of Pilsbury, Madison & Sutro, and attorney for the reorganization committee. The Market Street Railway is now being recapitalized preparatory to its taking over the properties in accordance with the reorganization plan.

Boston "L" Lost $346,951

Trustees Feel Confident Receipts for Coming Six Months Will Exceed Cost

For the year ended Dec. 31, 1920, the receipts of the Boston (Mass.) Elevated Railway failed to meet the actual cost of the service by $346,951. Adding to this latter amount the current deficit of $23,659 existing on Dec. 31, 1919, makes the present deficit from current operations $370,610. This amount must be absorbed during the six months ending June, 1921, in order that there be no deficit to be assessed against the public on that date.

The board of trustees feel confident, however, that this will be accomplished and that the receipts during the coming six months will exceed the cost of the service by an amount which will also permit of absorbing in part, if not entirely, the $435,348 charge for the back pay applying to the months of May and June, 1919, which has not yet been provided for.

The extraordinary expense of $615,548 on account of the severe snow storms is nearly twice the net deficit. The coal situation in New England was another factor in causing the deficit last year, an average price of $10.07 for the 258,087 tons of coal used being responsible for an usually high total cost of power. The details of the earnings are shown in the accompanying table:

RECEIPTS AND COST OF SERVICE OF BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31, 1920

Receipts		
From fares		$33,096,764
From operation of special cars, mail pouch service, express and service cars		105,961
From advertising in cars, on transfers, privileges at stations, etc		300,228
From other railway companies for their use of tracks and facilities		40,703
From rent of buildings and other property		100,499
From sale of power and other revenue		106,707
Total Receipts from direct operation of the road		$33,750,862
Interest on deposits, income from securities, etc		280,774
Total Receipts		$34,031,636
Profit and loss, delayed items		215
Cost of Service		$34,031,851
Operating Expenses:		
Maintaining track, line equipment and buildings (including $615,548.70 snow expense)		3,209,276
Maintaining cars, shop equipment, etc		3,011,850
Power (including 258,087 tons of coal at $10.07, $2,597,652.93)		3,603,992
Depreciation		2,004,000
Transportation expenses (including wages of car employes, car house expenses, etc.)		11,528,181
Salaries of administrative officers		80,059
Law expenses, injuries and damages, and insurance		1,194,762
Other general expenses		1,137,002
Total operating expenses (of which $17,216,445.20 wages)		$25,769,122
Taxes, proportion		1,142,987
Rent for leased roads (exclusive of subways)		2,638,562
Proportion of rent of subways and tunnels, to be paid to the City of Boston		1,537,919
Interest on B. E. bonds and notes		1,494,795
Miscellaneous items		59,068
Proportion of dividend rental under Acts of 1918		1,463,668
Proportion of rent of Cambridge subway to be paid to Comm. of Mass		252,513
Interest on unpaid taxes		20,169
Total cost of service		$34,378,803
Net loss		$346,951
Revenue passengers	335,526,561	
Receipts per revenue passenger	10.143 cents	
Cost of service per revenue passenger (of which labor cost 5.131 cents)	10.246 cents	

New Orleans Still Floundering Around for Railway Solution

The railway problem at New Orleans, La., appeared on Feb. 19 no nearer solution than it was before the advent of the investment bankers of the East and the submission of the service-at-cost plan of Receiver O'Keefe, approved by the representatives of the security holders, as offering a remedy to correct local traction complaints.

The proposed plan is unsatisfactory to the city fathers and since neither the receiver nor the investment bankers could or would offer any other means of giving New Orleans up-to-date service at the franchise fare of 5 cents it has become incumbent upon the city officials to find a remedy.

The city administration appears not to be concerned in the valuation of the property. It seems bent on learning how the lines can be operated so as to live up to the fare fixed in the original franchises held by the several lines making up the present system.

To do this intelligently and satisfactorily four experts will be selected, two of whom probably will be local men, to make a survey of the situation and report back to the Commission Council the result of their findings as to the most feasible, practical and economical plan of operation. When this plan, whatever it may be—whether a modified service-at-cost plan or some other plan—is adopted, then and not till then will the matter of valuation be taken up and considered.

Foreclosure Argument on March 5

Judge Julius M. Mayer, in the United States District Court, at New York, on petition of the bondholders' committee of the New York Railways has set March 5, as the date for argument on the question of issuing a foreclosure decree for the major part of the properties of the system.

Receiver Job E. Hedges was ordered by the court not to pay the semi-annual interest, due on March 1, on the Lexington Avenue & Pavonia Ferry Railway 5 per cent bonds. This will make the third semi-annual instalment of interest on this line in default.

Application for an order to disaffirm the leases of the Broadway & Seventh Avenue line, the Sixth Avenue line, the Twenty-third Street line, and the Christopher & Tenth Street line, all operated by the New York Railways, will be heard on March 9.

Sir Adam Beck Purchase Arbitrator

Sir Adam Beck has been officially appointed to represent the city of Toronto, Ont., in the arbitration to determine the price to be paid by the city for the assets of the Toronto Railway when the railway is taken over next September. The Toronto Railway has not yet named its representative on the board of arbitration, and has informed the city that it does not desire to do so until the third man has been selected. Instead of leaving the selection of the third man to the two other representatives the railway is desirous of reaching an agreement directly with the city in regard to the selection of a chairman, and states that it will name its representative after the chairman has been selected. The city is awaiting Sir Adam Beck's return from England for advice in regard to this request.

Many Factors Contributed to Receivership

Ohio Electric Railway Unable to Contend with Flood, Automobile and Increased Costs

One of the largest systems of interurban roads in the country, the Ohio Electric Railway, has recently been thrown in the hands of B. J. Jones as receiver. It comprises 467.26 miles of interurban lines and 33.36 miles of city lines. The company has outstanding $8,377,200 of bonds and $11,000,000 of stock. No dividends were ever paid on the stock. The road was beset by all the increased costs of the war-time period and just previous to the war suffered severe losses by flood.

THE principal causes that led up to the receivership, which came about through failure to meet the bond interest, are as follows:

1. Inadequate passenger rate of 2 cents a mile that went into effect in 1906.
2. Loss by flood of 1913.
3. Growth of the automobile industry, including transportation by trucks, augmented by the construction of good roads in the State.
4. Excessive costs for new tracks and paving of streets in cities, towns and villages on which the road operated.
5. Abnormal increase in material and wages since August, 1914.
6. Failure of the company to obtain increased rates of fare in cities and for interurban business commensurate with the increased cost of operation.

A small group of financiers conceived and carried out a plan for the Ohio Electric Railway by forming in 1905 the Ohio Syndicate, to which approximately $8,000,000 was subscribed and paid in. They immediately incorporated the Cincinnati Northern Traction Company and leased the Cincinnati, Dayton & Toledo Traction Company, a line extending from Cincinnati to Dayton, with branch lines. The same year they acquired the Lima Electric Railway & Light Company by lease, and in 1909 purchased the property.

Appleyard Lines Taken Over

The Appleyard properties were purchased at receivers' sale in 1906. These lines consisted of the Dayton, Springfield & Urbana Electric Railway, the Springfield & Western Traction Company, the Urbana, Bellefontaine & Northern Railway, the Columbus, London & Springfield Railway and the Columbus, Grove City & Southwestern Railway. In 1906 the Dayton & Northern Traction Company and the Dayton & Muncie Traction Company were purchased, also the Columbus & Lake Michigan Railroad, operated by steam. Later they rebuilt this line and electrified it. The same year the Dayton & Western Traction Company was leased likewise the Fort Wayne, Van Wert & Lima Traction Company. In 1906 the Columbus, Newark & Zanesville Electric Railway, including the Columbus, Buckeye & Newark Traction Company, the Newark & Granville Street Railway and the Zanesville Railway Light & Power Company were leased.

In 1907 and 1908 a line was constructed from Bellefontaine to Lima and from Lima to Toledo and the short line cutoff between Summerford and Lafayette (between Springfield and Columbus), thus connecting all lines and completing the system of 617 miles.

All of the lines purchased and leased were practically rebuilt, new cars purchased, new electrical machinery installed, and the system put in first-class operating condition. The Ohio Electric Railway was incorporated May 16, 1907, to take over all the property acquired by The Ohio Syndicate as the operating company.

Immense System Included

The system as completed comprised the following lines:

From Cincinnati to Hamilton and Dayton, with branch line to Germantown.

From Dayton, Ohio, to Richmond, Ind., with branch line to New Paris.

From Dayton, Ohio, to Union City, Ind.

From Dayton to Springfield, with branch line to New Carlisle.

From Springfield to Urbana, Bellefontaine and Lima, with branch line at Bellefontaine.

From Lima, Ohio, to Fort Wayne, Ind.

From Lima to Toledo.

From Lima to Defiance.

From Springfield to London and Columbus, with branch cut off from Summerford to Lafayette.

From Columbus to Orient.

From Columbus to Newark and Zanesville, with branch to Granville and Buckeye Lake.

Also city lines at Hamilton, Dayton, Lima, Newark and Zanesville, all in Ohio.

The line from Cincinnati to Dayton was operated by the company until July 1, 1918, when it was surrendered to the new owners, the Cincinnati & Dayton Traction Company. The line Dayton to Richmond was operated until April 24, 1920, when it was surrendered to its owners.

The Ohio Electric Railway has issued and outstanding the following amounts of stock:

Preferred	$ 3,000,000
Common	8,000,000
Total	$11,000,000

All of the common stock of the leased lines is owned and controlled by the company.

The company has the following bonds issued and outstanding:

First mortgage	$4,200,000
Second mortgage	2,927,200
Lima Electric Ry. & Light Co.	1,250,000
Total	$8,377,200

While no dividend has ever been paid on the stock of the company, it was able to pay all interest on its bonds and rentals to leased lines until the cost of labor and material reached such abnormal proportions on account of conditions caused by the war.

$1,500,000 Damage by Flood

The flood of March 25, 1913, caused damage to the property of the company of approximately $1,500,000.

The business of the company has suffered, like all other traction lines, from the automobile, especially where the roads have been improved.

First Profit in Three Years in Grand Rapids

For the first time in three years the Grand Rapids (Mich.) Railway has been able to show a profit over operating expenses during a thirty-day period. The 8-cent fare now in effect is responsible for the surplus. This profit was revealed for the month of January in the report submitted to the City Commission. It amounts to the munificent sum of $179.53.

In January, 1919, the company operated at a loss of $1,980. In January, 1920, the loss was $5,170.

The earnings from all sources last month was $166,278. The general expenditures were $14,789. The maintenance expense was $21,741, and the cost of power $14,041.44. The total of expenditures including salaries was $115,264,013. From this is deducted taxes, interest on funded debt, amortization of bond discount, sinking fund and depreciation, totaling $50,834.

One of the features of the report is the showing made by the 8-cent fare over the 6-cent fare in vogue in January, 1920, when business conditions were excellent. The 8-cent revenue brought into the coffers of the company $161,117, while the 6-cent fare brought in only $106,737.

12.5 per Cent Increase in Standard's Net Earnings

Preliminary reports of earnings of the utility subsidiaries of the Standard Gas & Electric Company, Chicago, Ill., for the calendar year 1920 show an increase of 18.7 per cent in gross and 12.5 per cent in net. The annual reports of these companies are under audit and the final figures may be slightly changed, but any differences will not be material. The comparative figures are as follows:

Year:	Dec. 31, 1920	Dec. 31, 1919
Gross earnings	$32,252,232	$27,158,137
Net earnings	11,230,742	9,980,446

The 1920 gross and net earnings reports of the individual properties are as follows:

	Gross Earnings	Net Earnings
Arkansas Valley Ry. Lt. & Pr. Co	$1,865,743	$608,632
Fort Smith Light & Traction Co.	1,070,391	300,793
Louisville Gas & Electric Co.	4,469,317	2,088,990
Mobile Electric Co.	737,446	214,081
Mountain States Power Co.	928,923	294,292
Northern States Power Co.	11,798,779	4,466,938
Oklahoma Gas & Electric Co.	5,070,656	1,276,114
Ottumwa Railway & Light Co. (11 mos.)	513,467	105,185
San Diego Cons. Gas & Electric Co.	2,661,046	883,427
Tacoma Gas & Fuel Co.	561,098	104,909
Western States Gas & Electric Co.	2,224,909	815,268
Puget Sound Gas Co.	163,985	25,916
Southwestern General Gas Co.	292,637	120,870
	$32,252,232	$11,230,742

In spite of continued high costs every property was able to show a consistent gain in net earnings, as well as in the gross.

Financial News Notes

Sale of Real Estate Postponed.—Sale of the real estate of the New York (N. Y.) Railways under foreclosure proceedings, to satisfy the provisions of the indenture securing the first real estate and refunding mortgage 5s has been postponed by consent until March 2.

Hydro Takes Over Guelph Radial Railway.—The ratepayers having voted favorably on the proposal in January, the Guelph (Ont.) Radial Railway was on Feb. 12, turned over to the Hydro Power Commission of Ontario, which will operate and manage the system for a period of fifty years.

Details of Reorganization Fast Being Concluded.—Stockholders of the Market Street Railway, San Francisco, Cal., have ratified the proposal whereby the company will be merged with United Railroads, San Francisco. Under the plan of reorganization of United Railroads, the company will take the name of the Market Street Railway, which will issue new securities. Steps toward foreclosing the mortgage of the underlying bonds have already been taken.

Municipal Line Lost $281 in Six Months.—Operation of the Amarillo (Texas) Street Railway by the municipality during the last six months has resulted in a loss, according to the report of City Manager J. G. Colby covering that period. The city manager's report showed that the city had paid $600 a month for the lease on the property, and that revenues during the time had amounted to $5,789, leaving $2,189 after payment of lease charges. Operating expenses exclusive of lease charges amounted to $2,470, leaving a net deficit of $281 for the six months.

St. Paul Continues to Lose.—Despite the fact that the passenger revenues of the St. Paul (Minn.) City Railway increased from $436,756 in November, 1920, to $459,100 in December, 1920, the company's income shows a deficit for the month of December of $28,254 compared with $6,750 for the preceding month. The very large increase in operating expenses, which more than offset the advance in revenue, is given as the reason. Commissioner McDonald in commenting on the report explains that the cost of removing snow was the principal item in the higher expense account.

Federal Light Makes $601,028 in 1920.—In its twelve months' statement ended Dec. 31, 1920, the Federal Light & Traction Company, New York, N. Y., shows gross earnings at $4,606,421, an increase of 18.2 per cent over the same period a year ago. Expenses, including taxes, increased over 20 per cent and the net income advanced 14 per cent over 1919. After deducting interest charges, Central Arkansas Railway & Light Corporation dividend and Springfield Railway & Light Company dividend a balance of $601,028 remains. This is an increase of 42 per cent over the balance of a year ago.

Deficit of $16,711 for Interurban.—The stockholders of the Indianapolis & Cincinnati Traction Company at the annual meeting on Feb. 9 re-elected officers and directors. The company showed a deficit for the year of $16,711, after deducting all expenses, including the fixed charges, interest on the company's bonds, interest on underlying bonds of the Indianapolis, Shelbyville & Southeastern Traction Company and dividends on underlying preferred stock of Indianapolis & Southeastern Traction Company (Shelbyville division).

Priority of Claims Considered.—The much discussed Grafton Traction Company bankruptcy case, pending in the United States District Court of West Virginia and placed before Referee O. E. Wyckoff for disposition, was considered on Feb. 5 at Grafton, W. Va. Mr. Wyckoff has been working for weeks on this case to determine the relative value and priority of the liens against the company and affiliated corporations and recently he notified the interested attorneys that he would be ready on Feb. 5 to have his findings considered by the several counsel and hear objections and contests of his findings.

Hydro Commission Reports Profit for Interurban.—The first annual report on the operation of the Sandwich, Windsor & Amherstburg Railway, Windsor, Ont., issued by the Ontario Hydro Power Commission, claims a net profit on the year's business of $22,335. The total earnings were $296,373. The sum of $49,000 was set aside for interest on bonds and $82,000 for sinking fund. Assets are placed at $2,144,755, and liabilities at $1,849,000. Extensions and improvements planned for this year will cost more than $1,000,000. The line was formerly owned by the Detroit United Railway.

Tacoma Municipal Line Still Losing.—The Tacoma (Wash.) Municipal Railway from its inauguration to Jan. 1, 1921, has a deficit of $152,556, of which $44,127 was recorded during the twelve months included in the 1920 report of the city controller. The 1920 deficit was about half the deficit of 1919, when the shortage totaled $85,836. The deficit of November, $4,238, increased to $10,373 in December, 1920, but this increase was largely accounted for by the charge of $4,743, representing accrued interest upon the $125,000 in loans made to the municipal railway fund out of the general fund of the city. In 1917, before the extension of the city line to the Todd Drydock & Construction Corporation's plant, the line made a little money, but, with the extension of the trackage, the line began losing and, in 1917 and 1918, showed a total deficit of approximately $22,000. Approximately 3,000,000 passengers were carried on the line during 1920, virtually the same number carried in 1919, the report shows.

Traffic and Transportation

Service-at-Cost Explained

Cincinnati Traction President Seeks to Remove Any Doubts About Recent Grant There

Service-at-cost as operated in Cincinnati, Ohio, is to be explained to the riding public of that city in a statement to be issued by W. Kesley Schoepf, president of the company. Mr. Schoepf hopes to clear up any misunderstanding about the grant that may exist in the mind of the car rider and to show that the Cincinnati Traction Company is a business doing its best to serve the public and seeking in return only enough revenue to pay the interest on the investment. He will outline for the benefit of the public the possible method of procedure that would be taken by a city like Cincinnati to obtain electric railway service if such service were not in operation at present.

By keeping the three elements, the public, the investor and the employee, constantly in mind, says Mr. Schoepf, the question becomes simple and understandable. Attempts to make it complicated or mysterious are generally the work of designing critics who seek by unfair methods to engender the belief of something being wrong that they would attempt to remedy, thus seeking to gain political advantage from a public service that should not be dragged into politics. Mr. Schoepf says that the Cincinnati service-at-cost plan provides for the public the desirable features of municipal ownership with the undesirable ones left out. He holds that it is not alone as a matter of fairness and justice that a return is allowed on money invested, but it is necessary to the raising of new capital for needed improvements that interest be paid on that already invested.

PUBLIC MUST PAY ITS SHARE

Mr. Schoepf maintains that the public, too, has a very definite responsibility in the service-at-cost plan. He says that in the one important item of taxes the public must decide whether or not it wants to make the railway a tax gatherer by imposing upon it a franchise tax, viaduct taxes, street repair taxes, etc., knowing full and well that the public in turn will have to pay it in the form of increased fare. Almost a cent of the car fare in Cincinnati is added onto what would otherwise be necessary simply for the purpose of raising the taxes that have to be paid, the amount of taxes paid in 1919 being $916,472. In 1920 it was slightly more than $1,000,000.

Explaining how in September, 1920, when the rate of fare was 8 cents, the cost per revenue passenger was 8.7 cents, Mr. Schoepf submitted the following itemized account, showing how the revenue per passenger was distributed:

	Cents
Motormen and conductors	2.5
All other wages and salaries	1.33
Cost of power, including coal	1.1
Material and supplies (except coal)	0.9
Taxes (not including city franchise tax)	0.5
Rentals, interest and sinking funds	1.33
Return on capital	0.4
City tax	0.3
Total	8.7

Summing up the whole situation, Mr. Schoepf says that the service-at-cost plan simply means that the city, representing the public, has said to the company, representing the investor:

> We agree with you, that this railway which you have built is worth about $30,000,000, on which we will allow you to earn a little less than 6 per cent, and no more. The interest rate may be low, but we will make it as certain and sure to you as we can, so that you can borrow more money and make the improvements we tell you to make, allowing us to say what kind of securities you may sell and at what price, and what interest you may pay. We will also reserve to ourselves the right to order any kind of service we want and you must give it; because we are willing to pay for it. Finally, if you are very careful and economical and get fares down to 6 cents, we will allow you a little bit more—just to reward your efforts.

Lower Fares Sought in Revere, Mass.

Great public interest in a movement designed to secure better service and lower fares in the Revere section, north of Boston, Mass., was indicated when more than one thousand citizens attended a hearing on Feb. 16 at the State House in Boston. The public hearing was held by the joint committee on street railways, on bills calling for the state to create transportation districts, including the Chelsea and Revere lines of the Eastern Massachusetts Street Railway, and consolidate or lease these lines to the Boston Elevated Railway.

It is understood that the principal grievance of the public is a 15-cent fare from Revere to Boston on the Eastern Massachusetts Street Railway, while other suburbs of Boston, more remote than Revere, are served by the elevated for a 10-cent fare.

The question of discontinued lines was also brought up and criticised, but representatives of the Eastern Massachusetts explained that under the laws creating the Trustee method of operating the system, it becomes obligatory to make lines pay, or else discontinue them.

The Eastern Massachusetts Street Railway has recently published a statement showing that the January, 1921, earnings decreased 16 per cent from earnings of January, 1920.

Fare Increase Allowed

Private Company with Contract Calling for Operation of Railway at Fixed Fare Over-ruled

Judge R. M. Call, in the federal court, has dismissed the petition of the Ortega Company, a realty development concern, for an injunction restraining the Jacksonville Traction Company from charging a 7-cent fare on its lines to Ortega, a Jacksonville suburb, following the award of the Railroad Commission fixing that rate for the company's lines. The Ortega Company contends that the railway for certain cash considerations, franchises, etc., agreed to operate cars on certain schedules with a 5-cent fare. It alleged a breach of contract.

Judge Call held that the decision of the Florida State Supreme Court in the matter of the writ to compel the Railroad Commission to assume jurisdiction was binding in the federal courts. In the case mentioned the court ruled that the commission's duties included the fixing of just and reasonable rates on traction company lines, and that such duties must be performed equitably notwithstanding any private contract.

Under Sec. 30, Art. 16, of the Florida Constitution the State Supreme Court also has held that no public utility can make a binding contract for rates with an individual or corporation, or municipality, except that such contract shall be subject to future legislation. The future legislation in this case was the act creating the Railroad Commission with power to fix just and reasonable rates. This latter ruling was made several years ago when the Tampa Waterworks Company opposed a reduction in rates in Tampa.

The fact that there was a consideration of actual cash in the Ortega Company's contract with the Jacksonville Traction Company has no bearing on the question, according to Judge Call, who pointed to the fact that the franchise consideration, always valuable and with an actual cash value, was always evident in such contracts, and that even financial consideration should not be permitted to buy individual favor over the public welfare. Mention of this suit was made in the ELECTRIC RAILWAY JOURNAL for Feb. 19.

Jitney Menace Intolerable in Paterson

Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., on Feb. 16 notified Mayor Van Noort of Paterson, N. J., that operation of the Public Service Railway lines throughout the Passaic division, which includes the cities of Paterson, Passaic and Clifton, would be terminated unless destructive competition by jitney buses was eliminated by the city authorities of Paterson. Conferences are now in progress as a result of which it is hoped an arrangement may be made that will obviate the necessity of the railway cutting off service.

Seven Cents in Louisville

Temporary Restraining Order by Court Permits Company to Advance Rates in Controversy Many Months Old

Fares on the Louisville (Ky.) Railway went to 7 cents on Feb. 21, with tickets for school children and teachers at 3½ cents, and transfers issued the same as formerly. Judge Walter Evans, of the United States District Court, Louisville, on Feb. 18 issued a temporary injunction or restraining order against the city of Louisville, the Mayor and City Attorney, preventing interference with the increased fare. Judge Evans after reviewing the case during the week ended Feb. 19 announced that the court could not issue a restraining order until the company increased its rate. The company then announced the new rate and the court on the amended petition issued the injunction.

THE COMPANY announced that no rebate slips would be issued for redemption in case the upper courts failed to sustain Judge Evans. Orders were also issued to all trainmen to enforce the order, starting at 4 o'clock on Monday morning, and where people refused to pay the 7-cent fare to eject them from the cars.

Alfred Seligman, attorney for the company, in addressing the men at a meeting on Feb. 18, emphasized patience and courtesy in handling persons who refused to pay the increase, or who might refuse to pay unless given receipts showing the payment. He said in part:

> Avoid any conversation or discussion with passengers of the necessity of action. Some people may not be aware of the raise in fare. Politely call their attention to the printed notices posted in every car. If a passenger refuses to pay the 7-cent fare the passenger should be invited to leave the car, and upon refusal should be ejected, using as little force as possible, but do whatever is necessary to accomplish said fact. When necessary or possible, call the police, but do not ask or direct the making of any arrests.

He stated the law did not differentiate between men and women. In the event that a trainman inadvertently accepted a nickel in payment of fare under the impression that the other 2 cents were to be tendered by the passenger the nickel was to be returned if the extra fare was not proffered at once.

It is expected that the increase in fare will enable the company to pay 5 per cent on preferred stock and 6 per cent on its common.

POLICE WILL GIVE ASSISTANCE

The chief of police issued orders to arrest all persons who refused to pay 7 cents or leave the cars. They will be charged with "breach of peace." Policemen are to act as though 7 cents is the legal rate, it being the legal rate in so far as they are concerned.

Mayor Smith announced that the mandate of the court would be carried out to the letter by himself and the city administration generally. The Mayor's office is refusing to offer any advice to citizens who are anxious to make it hot for the company.

One of the Councilmen who has fought the fare advance has announced that two ordinances will be introduced, one to have the company resume operations of lines stopped under a retrenchment policy and the other to reduce jitney bus licenses to $10, and require a surety bond of $5,000 instead of a real estate bond of $5,000. This will make it much easier on jitney bus operators, but it is doubtful whether they will turn out in any numbers even if the ordinance were passed, and it wouldn't have much chance with the Board of Aldermen, who favored the increase and voted that way. With the Board of Aldermen favoring the company there is not much chance that the Council, which has fought the company, will pass any retaliatory measures.

The city figured on carrying the case to the Circuit Court of Appeals on a supersedeas, which would have prevented the company from putting the increase into effect, but after considering the heavy damages which might accrue to the city if the decision was upheld it was decided not to make that move. Judge Evans did not pass on whether or not the city holds 5-cent contracts.

It will probably take ninety days to arrange the proof and get a decision from the District Court of Appeals.

Officials of the railway figure that the increase will aggregate about $65,000 a month.

The property of the Louisville Railway is assessed for city taxes at $9,000,000, but the company held its property at $28,000,000 in a sworn statement in the Federal court in arguing for a fare increase that would pay dividends. Immediately a movement was started to force back payment on $19,000,000 of valuation not listed for taxation. The company in reply stated that its property was worth the sum stated on the basis of a fare of 7 cents, but not worth it on a 5-cent fare basis.

The 7-cent fare went into effect without any complications from passengers, who paid the increase without arguing, there being no arrests or trouble of any kind. Heavy snow and cold weather on the first day of the new fare failed to slow up traffic. It has been observed that passengers have worked out a system of their own for securing receipts for fares of 7 cents. Riders who do not actually need transfers secure and hold them as receipts for a cash fare paid on a certain date.

Information from the office of James P. Barnes, president of the railway, shows that even in the industrial districts the public has not been the least bit ugly over paying the increase. Talk of walking clubs and other forms of retaliation is not taken seriously, as even the press has pointed out that 7 cents is a very small payment for transportation compared with the cost of time consumed in walking. Jitney buses are not expected to develop as a source of competition under prices for materials and supplies that exist at present.

The city of Louisville has announced that the case will be appealed to the Federal District Court of Appeals, at Cincinnati, in an effort to break the injunction. It will be probably some time between March 15 and April 15, if not later, before the appeal can come up for argument.

Officials of the company claim that there is no noticeable decrease in the number of passengers riding on the cars. There may be some decline in the number of passengers handled in good weather, but any such reduction will be more than offset by the increased fare.

Pay-Leave Plan Suggested for Providence

In order to relieve vehicular congestion in and about Exchange Place, City Hall, and along Dorrance Street, Providence, R. I., Public Service Engineer Ralph Eaton presented to the joint standing committee on railroads of the City Council a plan whereby the fare collection method on the cars of the Rhode Island Company would be changed from a strictly pay-enter plan to the pay-enter pay-leave scheme. Under this plan fares of outbound passengers are collected as they leave the car while on inbound trips fares are collected as passengers board cars in the outlying districts. Mr. Eaton in commenting on the plan states that it has for its object the reduction of delays in the downtown section on outbound prepayment cars.

Briefly, the plan contemplates allowing all passengers to enter cars in the downtown district without prepayment of fare by both front and rear doors, fares being collected as they leave the car. The use of both doors is expected to tend toward a more even distribution of passengers in the car, thus producing more comfortable loading. Moreover, as passengers do not prepay their fare delays are expected to be avoided both to passengers themselves and to following traffic. The disadvantage in this system is that in leaving the car only the rear door can be used as passengers must pay the conductor as they leave.

Mr. Eaton believes that a passenger boarding a car downtown during the evening rush hour is likely to be hampered with bundles, gloves, etc., and is not in as good position to pay his fare promptly as he is after he is aboard the car.

The proposed system if adopted will be installed on trial only on certain lines, probably the Cranston and Broad Street lines, which loop back from the center of the city. The Rhode Island Company has expressed its willingness to co-operate in this trial.

Rehearing in Ottumwa Case

The Supreme Court of Iowa has granted a rehearing of the Ottumwa Railway & Light Company case and has set the case during the March sessions of the court. The case involves the right of cities to fix permanent rates of fare by railways over a period of years.

The court has twice ruled on the matter. Recently it reversed a former opinion and held that cities did not have such a right without legislative action.

In setting the case for rehearing the court has asked for the presentation of printed arguments on the following questions:

> Assuming that the legislative power to make rates still rests exclusively in the Legislature, in that it has never delegated the same ("as appellant claims and as we are inclined to hold") and that, therefore, the City Council has never had the legislative power to fix the rate nor the power to bind the city for a fixed period, what gave validity or irrevocability to the 6-cent resolution adopted by the City Council (of Ottumwa) Dec. 23, 1918?
>
> Even though the city had no power to bind the city to a contract rate for a fixed time, did that fact disable the railway from binding itself to a continuing condition of the franchise as provided in Section 7 thereof, whereby the company could not charge in excess of its specified maximum rate?
>
> Can the company breach or ignore this provision of Section 7 and still maintain its right for franchise?

Transportation News Notes

Wants Ten Cents in Huntsville.—The Alabama Power Company, operating in Huntsville, has notified the Council of that city that it will petition the Public Service Commission for an increase in fares. The present rate is 7 cents and according to W. M. Stanley this is not sufficient to meet operating costs. A 10-cent fare will be sought.

Wants More on Penn Lines.—The Northumberland County Railway, Sunbury, Pa., has filed with the State Public Service Commission a notice of its intention to raise its fare from 6 cents to 7 cents. The Warren Street Railway, Warren, has also notified the commission that it will raise its cash fare from 6 cents to 7 cents. The company proposes to sell tickets at the rate of ten for 63 cents.

Skip Stop in Vancouver.—The British Columbia Electric Railway, Vancouver, B. C., is inaugurating the skip stop. This system has already been placed in operation on the Kerrisdale line, Vancouver, and public opinion is being canvassed as regards its general adoption. So far 95 per cent of the communications received from the railway's patrons have been favorable to the extension of the plan.

Lull in Fare Fight.—The agitation over increased railway fares in Jackson, Miss., has subsided, and though the matter is at rest at present it is highly probable that the Jackson Public Service Company will seek relief from the city without having recourse to the courts. With the hope of increasing its revenue the company recently petitioned the city for permission to advance fares. Subsequently the city put the matter before the people. At a referendum they decided against the advance. Since the election no definite steps have been taken by the Service company.

Jitney Regulatory Bill in Iowa.—A bill which would bar jitney buses from streets on which electric railways are operated has been introduced in the Iowa House by F. C. Lake, Sioux City. Jitneys would, however, be permitted by the bill to cross bridges where there are electric railway tracks and to cross at right angles streets where there are such tracks. Violators of the law would be subjected to a fine of $300 or imprisonment in jail not to exceed sixty days.

Ten Cents Authorized in McAlester.—The Oklahoma Corporation Commission has granted permission to the Choctaw Power & Light Company, McAlester, Okla., to charge a 10-cent fare in that city. Rates along interurban lines will be increased proportionately; between McAlester and Hartshorne from 50 to 55 cents; from McAlester to Haileyville from 45 to 50 cents. In the city special books will be issued with three tickets for 25 cents. On the interurban twelve tickets will be sold for $1 and any one of these will be accepted between points where the cash fare is 10 cents. The new rates became effective on Feb. 15.

Ten Cents Sought in Montgomery.—The Montgomery Light & Traction Company, Montgomery, Ala., has filed a petition with the State Public Service Commission asking permission to charge a 10-cent fare on its lines in Montgomery and suburbs. The company wants a 10-cent fare continued in effect until the income of the property can produce in addition to legal interest on a fair value of the property a stabilizing fund of $200,000. The petition makes clear the company's intention of decreasing the rate of fare to 9 cents and perhaps 8 cents "as conditions and occasion demand." A meeting will probably be held early in March to discuss the petition.

Publication Renewed.—The Twin City Rapid Transit Company has resumed publication of *Rapid Transit News* under date of Feb. 10. This pamphlet will be issued indefinitely "as a medium of direct communication between the company and the car-riding public." In this first number of Vol. 2 an explanation of the Brooks-Coleman bill now before the Legislature is given in detail, prefaced by the needs and activities of the Twin City lines. *Rapid Transit News* says that more miles of extensions were laid in the Twin Cities of Minneapolis and St. Paul during the year recently ended than in any other city in the country with the possible exception of New York.

Syracuse Case Continued.—According to figures submitted by Milo Roy Maltbie, representing the city of Syracuse before the Public Service Commission of the Second District in the proceeding before that body regarding fares on the lines of the New York State Railways in that city, the actual reproduction cost new less depreciation of the lines is $4,864,121. Further testimony is to be taken. The company applied to the commission to charge at least 10 cents after a service-at-cost plan had been rejected by the city. The fare in Syracuse has been 6 cents.

Robbery Plot Fails. — Indictments charging forgery have been returned against the three counterfeiters of car tickets in a plot to rob the Georgia Railway & Power Company, Atlanta, Ga. C. L. Lumkin, a conductor on the Buckhead line, was arrested several days ago and confessed the entire story to railway officials. His confession implicated L. and H. C. Bumpous, who were arrested in Gadsden charged with being the "brains" of the scheme. The men made a contract with a printing establishment in Birmingham and the concern thanked the company in turn for the order. In this way the plot came to light at once, although it would have come to light eventually under the company's plan of checking tickets.

Eight-Cent Fare in Concord.—The State Public Service Commission has authorized the Concord (N. H.) Electric Railways to charge 8 cents in Concord with the privilege extended to patrons of buying ten tickets for 70 cents. Several months ago the railway management petitioned the commission for an increase in cash fares from 6 to 10 cents with an 8-cent ticket fare and a straight 10-cent fare on the Concord-Manchester lines. The commission in its finding states that an increase in fares that will add "approximately $30,000 to what would be secured by the present fare" will help the present problem. The commission expresses the belief that a saving will be effected in the use of the one-man type of car and also in the downward trend of prices.

City Joins in Fare Petitions.—A petition from the city of Sault Ste. Marie, Mich., signed by the Mayor and city clerk and identified by officials of the Sault Ste. Marie Traction company together with a certified copy of a resolution joining the city and the company in an appeal for increased fares, has been filed with the Public Utilities Commission at Lansing. The resolution adopted by the city in the interest of the traction company was passed following a request for such action from that company several weeks ago. The knowledge that the company could not run unimpaired and satisfactorily unless higher fares were granted was found in an investigation by the City Commission, and the city joined with the company in its appeal to Lansing for higher fares. The passage of the resolution by the city was by unanimous vote.

Personal Mention

Promotions in Pittsburgh

M. T. Montgomery Appointed Suggestion Man of Pittsburgh Railways—C. A. Harris Made Storekeeper

M. T. Montgomery, who has been general storekeeper of the Pittsburgh (Pa.) Railways for a little over a year, has been attached to the main office of the company as a "suggestion man." His former position of storekeeper is now filled by Charles A. Harris, formerly assistant storekeeper.

In his new capacity Mr. Montgomery's work is principally outside of the office and consists of meeting employees of all grades and in all kinds of work to get their suggestions for increased efficiency in service and for correction of service and mechanical faults. Through Mr. Montgomery, the general manager, C. S. Jones, is thus able to keep in closer touch with the ideas of the various men on the system, as Mr. Montgomery acts in a capacity of what might be termed the personal representative of the general manager among the employees.

C. A. HARRIS

BOTH ARE EXPERIENCED MEN

Mr. Montgomery's railway experience began in 1898 with the Union Traction Company, which is now a part of the Pittsburgh Railways. After occupying there the position of conductor and later of dispatcher, he was made manager of the traffic department. In July, 1919, after having been manager of railways of the Monterey Railway, Light & Power Company, Monterey, Mexico, for six years, Mr. Montgomery became special assistant to the general manager of the Pittsburgh Railways. A biography and a portrait of Mr. Montgomery were published in the ELECTRIC RAILWAY JOURNAL for Jan. 31, 1920.

Mr. Harris, who succeeds Mr. Montgomery as general storekeeper, is about thirty-six years old. He entered railway work with the Connecticut Company in 1908 as stock clerk for the Hartford Division in Hartford. He was later advanced to the position of storekeeper in Hartford and was then made general stock clerk for the entire system with headquarters at New Haven. In 1917 he accepted a position as assistant chief clerk in the stores department with the Pittsburgh Railways. He was later made storekeeper of the Homewood store, from which position he was advanced to assistant general storekeeper in the fall of 1919.

Mr. McClure Appointed Receiver of Interurban

J. H. McClure has been made receiver of the Indiana, Columbus & Eastern Traction Company, Cincinnati, Ohio, by Judge Killits, Toledo, Ohio. In order to fill this position Mr. McClure resigned as vice-president of the Ohio Electric Railway and as president of the Indiana, Columbus & Eastern Traction Company, the Fort Wayne, Van Wert & Lima Traction Company, the Columbus, Newark & Zanesville Traction Company, and the Columbus Interurban Terminal Company. He has been succeeded as vice-president of the Ohio Electric Railway by H. G. Gilpin, formerly general mangaer of that property.

Mr. McClure was chosen last year by Day & Zimmerman, utility managers, to operate the Ohio Electric Railway, of which they have taken charge. He was previously general manager of the Citizens' Traction Company, Oil City, Pa., where he proved his ability both as an efficient and an able operator.

Major Gustafson Leaves Baltimore

Major Robert K. Gustafson, who had been chief draftsman at Carroll Park Shops of the United Railways & Electric Company, Baltimore, Md., since November, 1915, has left the company to take charge of the engineering and development work of a large manufacturing concern in Little Falls, N. Y. Before entering the service of the United Railways & Electric Company he was connected with the Guggenheim Company of Bisbee, Ariz. In 1917 Mr. Gustafson attended the first Officers' Training Camp at Fort Myer, and at its close was commissioned a lieutenant. He was sent to Camp Meade and in 1918 was commissioned captain, just before sailing for France. He went over with the 79th Division, 304th Ammunition Train, and was transferred to the 5th Division and returned with the 6th Division. He was discharged from the Army in July, 1919. In September, 1919, he was commissioned a major in the Reserves. Major Gustafson was born in New Haven, Conn., in 1891. He was graduated from Yale in the class of 1912.

D. K. Lewis at Winnipeg

D. K. Lewis Takes Position of Electrical Engineer of Winnipeg Electric Railway

D. K. Lewis has been appointed electrical engineer of the Winnipeg (Man.) Electric Railway, succeeding L. Trott. Since December, 1918, Mr. Lewis has been electrical engineer of the Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa.

Mr. Lewis was graduated from Clemson College, South Carolina, in 1903, having specialized in electrical and mechanical engineering. He entered the testing department of the General Electric Company at Schenectady, N. Y., and was later transferred to the engineering office in Chicago, where for twelve years he was construction foreman, installing apparatus in various towns and cities in the Western States. He enlisted in the United States Army in April, 1917, and was discharged in December, 1918.

D. K. LEWIS

The Winnipeg Electric Railway, besides operating 112 miles of track in and about Winnipeg, operates also the Winnipeg, Selkirk & Lake Winnipeg Railway and the Suburban Rapid Transit Company.

Changes in Tuscaloosa Personnel

Charles Hays has been made manager, purchasing agent, claim agent and electrical engineer of the Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala. Also E. C. Beatty, formerly superintendent of light and power, has been appointed engineer of overhead construction of the company. C. J. Erickson is no longer connected with the company as superintendent of the railway department and as master mechanic, his position now being filled by T. A. McDaniel.

Charles G. Staples has been appointed treasurer of the Springfield (Vt.) Electric Railway.

R. B. Stack has succeeded the late R. L. Utley as secretary of the Escanaba (Mich.) Traction Company.

E. S. Davis has been elected vice-president of the Springfield (Vt.) Electric Railway.

George O. Muhlfeld, managing director of Stone & Webster, has been elected a director of White Oil Corporation, to fill a vacancy.

Allan G. Hoyt, New York, N. Y., has resigned as vice-president of the Washington Railway & Electric Company, Washington, D. C. No successor to him has been elected.

E. Curtis has been appointed engineer of the power station of the Fort Smith Light & Traction Company, Fort Smith, Ark. Mr. Curtis succeeds L. J. Noble, who has been made general manager.

C. V. Means, traffic manager of the Los Angeles (Cal.) Railway Corporation, was elected chairman of the board of governors of the Southern California Passenger Association at the meeting of the board held on Feb. 10, 1921.

A. F. Albee has been appointed supervisor of tracks of the Boston & Worcester Street Railway, Framingham, Mass. Mr. Albee formerly had charge of the repair work and construction for the Marlboro Division of the railway.

John Whitsell, general superintendent of the Chicago & Interurban Traction Company, Chicago, has been appointed operating manager of the Winnipeg (Man.) Electric Railway. He succeeds Frank L. Butler, who resigned to accept the position as manager of the railway department of the Georgia Railway & Power Company, Atlanta, Ga. Mr. Whitsell will assume his new duties on March 15, 1921.

C. M. Young has resigned as superintendent of power of the Columbus (Ga.) Railroad and the Columbus Power Company. Mr. Young has held this position for about fourteen years. He began his career in public utility work about twenty-five years ago.

H. W. Williams has been appointed special representative to the general superintendent of motive power of the Chicago, Milwaukee & St. Paul Railroad, with headquarters at Chicago, Ill. He was formerly assistant engineer in the electrical department with headquarters at Seattle, Wash.

Edward F. Peck, vice-president and general manager of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., was recently run down by an automobile, sustaining internal injuries. Mr. Peck plays a prominent rôle in the city of Hampton, where he has many civic and industrial interests.

F. M. Kirby has been elected president of the Wilkes-Barre (Pa.) Railway. He succeeds the late Abram Nesbitt, who died several months ago. Mr. Kirby is president of the Miners' Bank of Wilkes-Barre and vice-president of the F. W. Woolworth Company. He was born in Watertown, N. Y. He has been a resident of Wilkes-Barre for the past twenty-five years.

A. W. McGuire has been named acting purchasing agent of the Twin City Rapid Transit Company, Minneapolis, Minn., by President Horace Lowry to fill the vacancy created several weeks ago by the promotion of W. Whiteford to acting general manager. Other promotions announced at the same time were those of A. P. Anderson to the position of general storekeeper and George Adams to the office of chief clerk.

Obituary

E. C. Carpenter, Claim Agent

E. C. Carpenter, claim agent of the Northern Ohio Traction & Light Company, Akron, Ohio, was killed on Feb. 12 by an Akron-Canton interurban car at Springfield Lake. Mr. Carpenter had been for twenty years claim agent of the Indiana Union Traction Company, Anderson, Ind., with which he became connected when it was the Anderson City Railway. He served under Charles L. Henry, now president and general manager of the Indianapolis & Cincinnati Traction Company, during the construction of the first interurban electric railway in Indiana, between Anderson and Summitville. During his connection with this company his work and ability were recognized by his election in 1909 as president of the American Electric Railway Claims Association.

In 1911 Mr. Carpenter became general manager of the Pittsburgh & Butler Street Railway and the Butler Passenger Railway, Pittsburgh, Pa. Under his active managership the roadway and rolling stock were greatly improved and during the summer of 1913 the system was changed from 6,600 volts alternating-current to 1,200 volts direct-current. He severed his connection with these companies in 1914. He was appointed claim agent of the Northern Ohio Traction & Light Company in 1918 to succeed H. L. Ehler.

Robert D. Carter, Jr., chief investigator in the claims department of the United Railways & Electric Company, Baltimore, Md., died on Dec. 26 last. Mr. Carter had been in the employ of the railway since September, 1914.

Myles Tierney, banker and one-time traction promoter of northern New Jersey, is dead. Mr. Tierney secured a trolley franchise from the city of Hoboken and built the White line between Hoboken and Paterson. This road was later absorbed by the Public Service Railway.

John F. Chambers, superintendent of steam plants of the Georgia Railway & Power Company, Atlanta, Ga., died on Dec. 12. Mr. Chambers was fifty-one years old. He had been in traction work since 1893, when he entered the employ of the old Atlanta Traction Company.

Skip Stops Given Up

Near-Side Stops to Be Tried in Downtown Districts of Kansas City—Loading Platforms Abolished

The "near-side stop" at all electric railway intersections is to supersede immediately the skip stops in the congested districts of Kansas City, Mo., from Eighth to Twelfth Street and Main Street to Grand Avenue. All loading platforms except at the depot are to be abolished. This is the result of an agreement reached at a committee hearing on an ordinance designed to abolish the present system of car stops.

The ruling of the committee, as outlined above, to which the railway company officials agreed, is to be effective only until the entire rerouted railway system is put in operation and tried out. This is hoped to be accomplished in thirty days. If, in that time, it is found that the near side stop system in the downtown district has proved satisfactory, the committee expressed its intention of recommending the passage of the ordinance, but for the present the ordinance is held in abeyance.

F. W. Fleming, one of the receivers for the railway, called attention to the fact that the ordinance as drafted would reduce the car speeds maintained at present, causing inconvenience to patrons. The passage of the ordinance would not only react on the car rider but would cause an additional expense of $750 a day to the company. The receivers, however, take the view that in justice to themselves they should place before the public the consequences of disturbing the system. Their only ambition is to give the best possible service and put the company on its feet.

Mr. Culkins Studying Cincinnati Figures

Figures requested by William C. Culkins, director of street railways, from the Cincinnati (Ohio) Traction Company to show cause for an increase in fare to 9 cents on March 1 have been received by Mr. Culkins from Walter Draper, vice-president of the company.

According to the statement gross receipts for 1920 were $8,959,996. The cost of operation was $9,625,301. Receipts for December when an 8½-cent fare went into effect were $821,585. The cost of operation in December was $915,733. In January receipts were $781,380. The cost of operation in January was $812,573.

The total deficit for December and January was $125,340. The company says the increase in fares is based upon the deficits during December and January under the terms of the service-at-cost franchise.

Mr. Culkins after receiving Mr. Draper's figures said that he would consult with Saul Zielonka, city solicitor, and would then announce what course the city will pursue.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Coal Production at Low Level

With Stocks and Demand Light, Bituminous Loadings Are Lowest in Ten Months

Bituminous coal production during the week ended Feb. 12, from the latest Geological Survey reports, showed a decline to 7,861,000 tons for that week, the lowest production since last April, although it is about the same as that of the corresponding week of 1919, but much lower, however, than for 1918 and 1920. The present condition of the coal market resembles quite closely the period which followed November, 1918, when industrial depression and a mild winter combined to limit demand. Early in 1919, however, the consumers had good stocks on hand; the stocks now are known to be very much lower.

The 1921 production is fast going down hill and the industry is said to be now approaching a condition resembling the quiet period of 1919. That the depression has not yet reached its lowest point is shown by the steady decrease in production indicated by advance reports of loadings by the railroads, according to the Geological Survey.

Prices also are reported to be very low and demand is weak. Mild winter weather, quiet industrial and railroad conditions and the lack of export demand keep the requirements at a low level.

Fair Demand for Trolley Wheels

Deliveries Are Good, Though Stocks Are Not Large—Producers See Good Year Ahead

Along with the slump in buying of virtually all material on the part of electric traction companies there has come a lessened demand for trolley wheels. Several of the large manufacturers report that despite this drop in sales a very fair volume of business is being placed right along. Worn out wheels, of course, have to be replaced, and it is undoubtedly this "necessity" buying that accounts for the fact that one or two factories are still working on orders previously booked. There is this distinct difference to be noted in the present orders, however, that they do not cover the needs of railways very far in advance. This is to be regretted, manufacturers state, because deliveries are now favorable, prices at a fair level and metal quotations unprecedentedly low. Almost without exception producers see a bright year ahead for sales.

Deliveries are reasonably prompt, in some cases orders being filled from stock, especially on wheels which have come to be recognized as more or less standard. In general stocks of the finished product are not large, one representative producer, for instance, having not a trolley wheel in stock and another virtually none. This condition of course does not obtain all over the field.

Prices in this line have declined but slightly. The shading has resulted from lower copper costs chiefly, as several manufacturers state that their labor costs are no lower yet. It is estimated by a large manufacturer of trolley wheels that the drop in prices from their peak has averaged about 5 per cent. This seems a fair proportion when it is remembered that in a table of price comparisons with pre-war prices for about fifty items appearing in the June 19, 1920, issue of the ELECTRIC RAILWAY JOURNAL trolley wheels showed the smallest precentage of price increase but one. The price of a 6-in. wheel in 1920, according to this table, represented but a 22.3 per cent increase over 1914. And it must be remembered that it requires only about an 18 per cent decrease from the peak quotation to wipe out this increase in price.

More Views on the Price Situation

Several Buyers of Electric Railway Equipment Who Were Interviewed Think Prices of Some Material Warrant Further Reduction—Buyers' Market Versus Sellers' Market

In the issues of Feb. 5 and Feb. 12 were presented the views of several large manufacturers of electric railway equipment on the question of current prices, their effect upon buying and the justice of existing quotations. There is another side to the matter of course—that of the railways. In an endeavor to present the feeling of the buying end of the industry in the matter of prices ELECTRIC RAILWAY JOURNAL has asked the views of several representative officials of traction companies, a few of which appear in part below.

One of the prominent purchasing agents in the East asks: "Why will not the manufacturer take some losses just now, when he, like the rest of us, is asking retail merchants to do the same? In a great many cases, especially among the larger manufacturers, they are not willing to do this, notwithstanding their tremendous profits during the war. This statement is based upon a couple of interviews I have had with representatives regarding copper products. One of them told me, 'We can't reduce our prices because we are using 19-cent copper,' and yet this same chap not long ago was lacerating such retailers as clothing and shoe dealers, because they would not take losses."

BELIEVES MANUFACTURERS ARE SINCERE IN PRICE VIEWS

In justice to the manufacturers, however, the general manager of one of the large Middle Western traction companies gives it as his opinion that manufacturers honestly do not feel they are charging exorbitant prices. This he attributes to a reckless wartime expenditure of money by manufacturers which makes it impossible for them to get back to a normal profit at the present time. This railway man does have this to say, however, that present prices of railway equipment are still higher than labor and raw material costs warrant. This he accounts for by the belief that a large percentage of manufacturing concerns are still basing their overhead charges on a war basis, and until such time as they will trim down their overhead he thinks it will be impossible to have lower prices.

EXPECTATIONS OF INCREASED RATES NOT REALIZED

The general manager of another property located in the Middle West outlines the situation in the following words: "The electric railways readily followed the trend of prices upward because they felt sure that relief would be given them in increased rates or revenues, or else by the reduction of their burden to correspond. This faith was not fully justified, as it turned out, and therefore the industry has taken the position that it can and will get along without the things that it wants and in fact needs until the price is where it can afford to buy them. Those who are the more dilatory in bringing their prices down to the basis of their value, or rather to the point at which the buyer will commence to buy, will be the only sufferers, because when they finally do reduce, as reduce they must, they will find that they have incurred, in addition, an extra selling cost which will entail an added loss. When there are more sellers than buyers the wise seller will go out to meet the buyers. Most of our sellers have forgotten this during the past five or six years that a sellers' market has prevailed."

Boston Elevated Loses Forty Cars in $400,000 Fire

Fire which started in the Neponset, Mass., carhouse of the Boston Elevated Railway early last Monday morning destroyed about forty cars and caused a loss estimated at $400,000. The equipment destroyed, in addition to the total loss of the building, stock of material and tools, which were valued at about $200,000, included twenty-three articulated cars, eight semi-convertible motor cars, four trailers and four miscellaneous cars and plows. Five cars in the storage yard were burned but can be repaired. Five other cars in the yards were undamaged and ten cars on one of the tracks in the carhouse were got out before the flames reached them. Cars from other parts of the system were transferred to restore normal service immediately.

Pole and Tie Producers Foresee Buyers' Market

Annual Convention of Northern White Cedar Association Takes Optimistic Tone, However

The twenty-fifth annual meeting of the Northern White Cedar Association, held in Minneapolis, Minn., on Feb. 8 and 9, was attended by thirty-two firms representing producers of poles, ties, logs, etc. The president of the association, after reviewing the wartime period of inflation and speculation, stated that the member companies had weathered the period of declining values and slumping demand in the latter part of 1920 much better than many other industries. "During the first half of 1920," the report states, "we were riding the peak of the wave. Most of our members were able to dispose of their products before the recession came."

NEED OF STRENUOUS SALES EFFORTS IN PRESENT YEAR

Regarding the outlook for the present year, however, genuine work and sales effort are seemingly going to be required to maintain sales. "We are starting 1921 with January, as a whole, the poorest business month in years. February should be better, and along later in April and the first of May we should be acquiring a full head of steam and be going ahead on a real normal basis," President Furlong stated. L. A. Page, Jr., of Page & Hill Company, speaking for the pole advertising committee, said: "Let us suggest that there will be no reward in 1921 for the man or concern who quits cold or lays down. . . . The customers of the members of your association will be somewhat more careful as to prices and more critical regarding quality. . . . Business will be good this year—for the man who thinks and digs for it. The intelligence of your sales effort and extent of your advertising will determine the size of your 1921 crop of sales."

Membership of the association increased from forty-four to forty-nine companies in 1920. Seven new companies were admitted to membership while two others withdrew. The officers elected for the new term were: Benjamin Finch of Finch Brothers, Duluth, Minn., president; W. B. Thomas of the White Marble Lime Company, Manistique, Mich., vice-president; H. F. Partridge, Minneapolis, treasurer; M. H. Schussler of the Coolidge-Schussler Company, Minneapolis, and W. C. Meader of the Bell Lumber Company, Minneapolis, directors, each director to serve two years.

Levis County Railway Loses Heavily in Fire

Fire originating in one of the cars in the carhouse of the Levis County Railway, Levis, Que., Canada, last Monday, caused a total loss of $230,000, Canadian value. Canadian exchange is quoted at 87.6 cents at present. Because of extremely low water pressure the carhouse, shops and contents were completely destroyed, with the exception of four Birney safety cars, two other new one-man cars and the construction cars.

The rolling stock destroyed included eight Birney safety cars, valued at $9,600 each (Canadian money); four Brill double-truck cars, valued at $6,000; three single-truck converted one-man cars, with a value of $5,000 each; four single-truck, double-broom sweepers, $6,000 each; one double-truck rotary plow and one single-truck rotary plow. These fifteen cars, four sweepers and two plows represent the entire rolling stock of the company with the exception of the six cars noted above as saved. The carhouse and shops were valued at $40,000 and the supplies and parts therein at $30,000. The loss is fully covered by insurance.

Electrification of Railroads in South Africa

A cablegram from Trade Commissioner Stevenson in South Africa to the Department of Commerce states that tenders are invited until May 3 for equipping the railway from Cape Town to Simonstown and other lines for electrical operation.

Rolling Stock

Delta Light & Traction Company, Greenville, Miss., has placed orders for two new cars, it is learned.

Louisville (Ky.) Railway Company, it is stated, has on its program of improved service purchase of about seventy new cars of the Peter Witt type, after the 7-cent fare which has just been authorized has been in operation for a certain length of time.

The Connecticut Company lost two passenger cars in a head-on collision which occurred on its Bridgeport-Shelton line, Feb. 22. A can of gasoline carried by one of the passengers exploded, burning the two cars to the trucks. Eight passengers were burned to death and twenty injured.

Hartford & Springfield Street Railway Company, Warehouse Point, Conn., suffered a loss estimated at $60,000 recently when the carhouse and its contents at Windsor Locks were destroyed by fire. The equipment burned besides the buildings, included three closed double-truck passenger cars, a large snowplow, one open double-truck car, one work car and a sand car, besides tools and car parts valued at $5,000.

Interstate Public Service Company, Indianapolis, Ind., has received the first of the ten all-steel interurban cars built by the Cincinnati Car Company for operation of through service between Indianapolis and Louisville. A trial trip was made from Greenwood to Louisville on Jan. 24. Harry Reid, president of the company; H. H. Buckman, master mechanic, who was responsible for the design of the car, and other officials made this trip to determine what changes, if any, may be necessary along the line before the cars are all placed in operation. Various tests were made to determine the current consumption and other phases of operation. Parlor cars will be put in service later and operate as trailers on through service between Indianapolis and Louisville. The new cars are 62 ft. long over all and are capable of obtaining a speed of approximately 75 miles an hour.

Track and Roadway

City & Suburban Railway, Brunswick, Ga.—It is likely that in the near future the City & Suburban Railway will extend its car line to Arco, a distance of 2 miles.

Columbus (Ga.) Railroad.—The Columbus Railroad expects to build 6,520 ft. of track, using 70-lb. rail on ballast, three diamond point turnouts, one Manganese railroad crossing.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—The New Jersey & Pennsylvania Traction Company on Feb. 15 filed with the Board of Public Utility Commissioners its answer to the petition of the City of Trenton which seeks to force the relocation of tracks on West Hanover street, Trenton. The company says that it would cost about $75,000 to do the work and that when it was first installed the work was under the supervision of the city. The company also says that it is without credit which would enable it to borrow the necessary funds and asks that the petition of the city be dismissed.

Galveston (Tex.) Electric Company.—Extension of the railway service by the Galveston Electric Company so as to give service to the extreme western portion of the city is asked in a communication presented to the City Commission by representatives of the Galeston Dock & Marine Council. A committee consisting of Frank S. Anderson, city attorney; J. H. Gernand, commissioner of streets and public property, and J. C. Purcell, commissioner of finance and revenue, was appointed to investigate the feasibility of such an extension and to report back to the commission.

Wheeling (W. Va.) Traction Company.—The Wheeling Traction Company expects to build within the next three months three new sidings and turnouts with Nachod signals.

Power Houses, Shops and Buildings

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—The Arkansas Valley Railway, Light & Power Company is planning an addition to its power plant in Pueblo. The plant will house a new 10,000 hp. steam turbine, boilers and surface condensing equipment. Other improvements are also under way including a new substation at Fowler, Col. The improvement plan will total about $1,000,000.

Hartford & Springfield Street Railway, Warehouse Point, Conn.—A carhouse of the Hartford & Springfield Street Railway in Windsor Locks was destroyed by fire on Feb. 6. The loss is estimated at $60,000.

Evansville, Ind.—Warren T. McCray, Governor of Indiana, has assured Mayor Benjamin Bosse at Evansville, Ind., that he will do all in his power to secure legislation to build a bridge across the Ohio River at Evansville. It is proposed to use the bridge for traction lines as well as vehicles. The bridge committee at Evansville, of which Henry C. Kleymyer, president of the Chamber of Commerce is a member, hopes to get an appropriation of $1,500,000 from the Indiana state legislature for the building of the proposed bridge. A similar amount will be sought from the Kentucky state legislature.

Empire State Railroad Corporation, Oswego, N. Y.—The Empire State Railroad is considering the matter of a modern station in a centrally located portion of the city. General Manager Odell, in consultation with officials and business men, has stated that the company needs larger accommodations than are afforded by the West First Street substation. The company wants a station where interurban and local lines pass.

Bamberger Electric Railroad, Salt Lake City, Utah.—On Jan. 31 the new depot at Kaysville, Utah, was opened by the Bamberger Electric Railroad for the use of the traveling public.

Beaver Valley Traction Company, New Brighton, Pa.—The Beaver Valley Traction Company expects to purchase one set of Nachod Signals. The company will also remodel its power house in order to provide additional shop facilities for inspecting and repairing.

Trade Notes

The Thomas A. Edison Company, Inc., West Orange, N. J., has filed notice of increase in capital stock from $2,000,000 to $3,000,000.

T. B. Skelton of the sales department of the Metal & Thermit Corporation, New York City, has been transferred to the Chicago office. His new address in that city is 6138 Langley Avenue.

The Washington-Virginia Railway Company, Washington, D. C., has purchased from the Economy Electric Devices Company a complete equipment of watt-hour meters for its six interurban cars. These meters will be of the power-saving type, equipped with car inspection dials.

The Long-Bell Lumber Company, Kansas City, Mo., is planning to erect a large mill and lumber plant on the Cowlitz River at Kelso, Wash. The proposed plant will have a daily capacity of 1,000,000 ft. and will be equipped with electrically driven machinery throughout. The company turns out wood poles of all kinds and other lumber products used in the electrical industry.

George E. Learnard, president of the International Combustion Engineering Corporation, 11 Broadway, New York, has just gone abroad to confer with certain officials of the Underfeed Stoker Company, Ltd., of London, England, as well as with some well-known men of France. Through the International company there is close affiliation between the Underfeed Stoker Company, Ltd., London, and the Combustion Engineering Corporation, New York. The Underfeed Stoker Company, Ltd., is planning to build a large new factory near London, and Mr. Learnard is to be present when this work starts. It is also expected that he will be on hand when work is started on a French factory. Mr. Learnard's belief is that the whole subject of proper combustion engineering is more or less a keystone in any reconstruction and rehabilitation program and that the general moral effect of considering the enormous economies that can be brought about by proper combustion engineering is perhaps more helpful to the general situation than the mere saving of dollars that it represents.

The Electro Service Company, Marietta, Ga., manufacturer of surge arresters, has recently appointed the following sales representatives: The R. W. Lillie Corporation, 176 Federal Street, Boston, and 30 Church Street, New York City, to cover the territory in New England and the upper part of New York State; the W. D. Hendry Company, Hoge Building, Seattle, to represent the company in the States of Washington and Oregon, British Columbia and Alaska; Jones & Hitchin, Lonja del Comercio 216, Havana, Cuba.

John Hunter, power plant engineer, has just accepted the office of chief engineer of the Heine Safety Boiler Company, St. Louis, Mo. Mr. Hunter was born in Scotland, where he was educated and served his engineering apprenticeship, following which he entered the marine engineering service. In August of 1905, Mr. Hunter became chief engineer of power plants of the Union Electric Light & Power Company of St. Louis, and since that date has been associated with various other important power projects. He is a past president of the Engineer's Club of St. Louis, and was a member of the Jury of Awards, Department of Machinery, at the San Francisco Exposition. In the American Society of Mechanical Engineers he was member of the Council as manager for three years, and as vice-president for two years.

New Advertising Literature

Insulation.—John C. Dolph Company, Newark, N. J., has issued a thirty-one-page descriptive catalog of "Dolph" insulating varnishes and compounds.

Conductors.—"Aluminum Electrical Conductors" is being distributed by the Aluminum Company of America, Pittsburgh, Pa.

Instruments. — The Westinghouse Electric & Manufacturing Company has developed the type SX switchboard ammeters and voltmeters.

Pulverized Coal.—Catalog No. 72 on "Pulverized Coal Equipment" has just been issued by the Fuller-Lehigh Company, Fullerton, Pa.

Hydraulic Valve — The Larner-Johnson Valve & Engineering Company, Philadelphia, has issued bulletin No. 2, descriptive of the Johnson hydraulic valve and differential surge tank.

Electric Cranes and Hoists.—The Northern Engineering Works, Detroit, has issued general catalog No. 28, covering its electric traveling cranes, hoisting machinery, etc.

Lightning Arrester.—A vacuum-type lightning arrester for telegraph, telephone and signal circuits has been placed on the market by E. Jacobus, 79 Orange Street, Newark, N. J.

Oil Coolers. — The Griscom-Russell Company, New York City, has issued a booklet entitled "The Cooling of Quenching Oil in the Heat Treatment of Steel."

Locomotives.—Digest bulletin No. 44013A of the General Electric Company is entitled "The Electric Divisions of the Chicago, Milwaukee & St. Paul Railway."

Automatic Generating Stations.—General Electric Company, Schenectady, N. Y., has issued a twenty-three-page illustrated bulletin, No. 40604, entitled "Automatic Hydro-Electric Generating Stations."

Steel Structures.—McClintic-Marshall Company, Pittsburgh, Pa., has published a twelve-page illustrated booklet on various types of steel structures erected by them for railroads, including bridges, shops, terminals, roundhouses, etc.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, March 5, 1921 *Number* 10

Applying an Old Principle in New Ways at Camden

IN AN ADDRESS before the American Electric Railway Association at Atlantic City last October Martin Schreiber of the Public Service Railway of New Jersey impressed his auditors with the fact that he appreciated to an unusual degree the importance of co-operation in organization. Moreover, he aimed to apply this principle in his own way on the portion of the Public Service property of which he had then recently been appointed manager.

Already Mr. Schreiber has been able to try out some of his ideas, and the results are as expected. A number of the things that have been done are outlined elsewhere in this issue. The article may be considered the ELECTRIC RAILWAY JOURNAL'S supplement to the Atlantic City convention address.

The best single "stunt" is the maintaining of close contact between the "service committee," comprising principally the heads of departments, and the actual problems of the property. This is accomplished in part by taking the committee bodily to the places where the problems originate. Such procedure requires a little time, but this expenditure is soon repaid through the economies achieved as a result of the conferences. The minutes of the conferences, which are kept in detail, show that this plan for holding committee meetings is mentally stimulating.

Camden is a city which presents unusually complicated transportation problems. The traffic is largely of the "rush-hour" variety, involving a low "load factor" in the use of the rolling stock. The difficulties were particularly acute during the war period. The conditions render close teamwork on the part of the personnel especially desirable. Those who ought to know say that such teamwork is conspicuous at Camden. The result will undoubtedly show on the ledger in due course.

Making the Schedule More Scientific

THE urgency of decreasing the ratio of outgo to income in electric railway operation has become so acute that schedule making now assumes a position of prime importance. It comes down to the proposition of giving good and constantly better service on one hand, while relatively increasing the revenue passengers per car-mile operated without unnecessary overcrowding.

There is today perhaps no greater opportunity for economy in electric railway operation than in correct schedule making. Savings at this point, at the present prices for labor, quickly reach so large a sum that any possibilities of improvement in this line warrant the most careful study on the part of the transportation department. But good schedule making requires expert schedule makers, of a type not needed, or not known to be needed, a few years back.

The art of the schedule maker is not an easy one. In the first place, if too few cars are run, possible traffic is lost, while if too many are scheduled, there is a waste in car-miles. The schedule maker has not only to determine the right number for the different hours of the day and where the cars are to be turned back but also how the schedule must be varied according to the weather, the day of the week, and the season and special events. Then he has to fit the desirable car schedule so determined with a suitable crew schedule, and then allow provision so that both can be changed quickly in case of emergency or blockade, without disturbance to the operation of the cars on the rest of the line. At the same time he must keep within the run limitations and outside time of workday set by agreements with employees. This work is arduous and complicated, since it demands a constant scrutiny of the factors whose change may affect existing conditions. Nevertheless, perhaps because it calls for this vigilance, it is fascinating and carries an especial appeal to the man who likes to solve problems in a field that is constantly changing, as is the case with city traffic.

Personally, we believe that graphical methods could be used in drafting and checking scheduled headways and car flow over crossings and through congested districts to a much greater extent than has been done in the past. The problem is essentially one of proportion and the adjustments of various factors to each other so as to give a harmonious whole, and for problems like this graphical methods are particularly suitable. They not only supply the means for obtaining an answer but they seem also better adapted to expose any serious defect in a proposed schedule than if a numerical method was exclusively used.

C. E. R. A. Awakens to Renewed Purpose and Activity

MUCH important history has been made in the past by the Central Electric Railway Association, but with the trying conditions faced by many of the members at home during the past three years the association could not be as much of a factor in their affairs. Hence it is not surprising that the program of the recent meeting at Toledo should have included as one topic for consideration "The Future of the C. E. R. A." It is pleasant to record that this taking stock of past accomplishments and future activities resulted in such a rejuvenation of the spirit of the association that the meeting took on the interest and importance which was characteristic of the association gatherings before the war.

Far from having served its purpose and being no longer vital, there developed a consciousness that the association is more than ever needed by the members and that it has only made a start on the great work to be done. Realizing this, the members laid plans for the future which bid fair again to make important history in the development of the great interurban railway system of the central states.

Chief among the plans tentatively proposed and upon which the executive committee will take action at its next meeting are the provision for separate meetings for the engineering and operating officials and the employment of an executive manager of the association. This manager would be the active head in executing all work planned by the organization, in directing and following up the work of all committees and in relieving committee chairmen of a large part of the detail now incumbent upon them, and which in many instances they have been unable to handle adequately either through lack of time or facilities.

It would seem that the goal of operating efficiency and development to which the Central Electric Railway Association should logically strive would be so to unite the member companies in standardizing operating practices, equipment and construction that they would be operated as one great electric railway system, with a service of kind and quality and extending where and when the natural lanes of travel of the public would dictate. An executive manager of the right caliber would be of great value to the association, both in the degree of attainment toward this desired goal and in shortening the time which would be required for that accomplishment.

The provision for separate meetings for the engineers will also be an important step in hastening more efficient and more prosperous days for the member companies, and it is a plan which this paper has strongly advocated on several occasions. The very fact that the subject has been brought up repeatedly at association meetings and has not been stifled by the failure of the executives to meet the suggestions of the operating men in a measure bespeaks the worth of the plan. Just what form of organization should be arranged is of less importance than the primary idea of providing gatherings at which men may meet with other men who talk the same language and are struggling with the same problems.

The plan suggested by the ELECTRIC RAILWAY JOURNAL in the issue of Dec. 11, 1920, it is believed, would be suitable. There it was proposed that the executive committee simply authorize meetings, in the nature of committees of the whole, of the equipment, track and electrical men respectively, at which problems pertinent to their particular work could be freely discussed without the feeling of restraint which many men have in the presence of their boss, as in the meetings of the main association. Each of these group committees would have a chairman appointed by the president, who in turn could appoint subcommittees to take up special problems. The chairmen would also bring up in the general session any matters approved by the committee requiring association approval. These group meetings could be held independently of the regular association meetings, or, better, in conjunction with them, or both plans could be followed if more meetings seemed desirable.

Whatever way may be devised, it is certainly to be hoped that the executive committee will now provide definitely for gatherings which will serve the purposes of the engineers and manufacturers, for it has been pretty well established by the experience of other railway associations that such meetings are of very great value to the individual companies, to the men who take part in them and to the industry.

Higher Municipal Expenses Increase Taxes

GOVERNOR MILLER'S recent message to the New York Legislature contained one sentence which, if fully appreciated by the public, would puncture the balloon in which many a political demagogue hopes to ride to office. This statement was as follows: "The people who ride in the subways do not realize that, in addition to their fares, they are paying to maintain $200,000,000 of subway bonds, and it does not matter whether they are taxpayers or rentpayers."

Nearly every person is a taxpayer or a rentpayer, and if he is not in either of these classes he is an indirect contributor as a food consumer. In other words, he is an unconscious taxpayer, and for this reason he should be interested in any proposal to add to the tax burden of his community. The statement given referred to the situation in New York City, but taxpayers and rentpayers are not confined to that community. Wherever a city plans to increase taxes or takes steps which may increase them every citizen is concerned.

Chicago is such a city, because just now there is pending in the Illinois State Legislature a bill for the creation about Chicago of a "local transportation district," a new taxing body designed by Mayor Thompson to take over and operate the surface lines. This "district" would have authority to issue bonds to an amount not exceeding 5 per cent of the value of taxable property. The limit of this taxing power has been estimated as being anywhere from $80,000,000 to $160,000,000, and the taxes thereby raised would be available to make up any municipal railway deficit not covered by a fare which is not to exceed 5 cents. Supporters of the Thompson plan have assured some doubting persons that there is not much possibility of having to resort to the taxing powers of the "district."

It is quite possible that if the proposition gets as far as a public referendum it will be indorsed, because a majority of the car riders would like to get back to the 5-cent fare and feel that they need not worry about the "other fellow's" taxes. They say, "Let the property owner worry." Nevertheless, the rentpayers of Chicago, like those of most other cities, are just now clamoring for relief against increasing rentals. The landlords argue that rents would not be so high if taxes and other expenses were lower. Rents certainly will not decline when taxes are being increased. So the tenant who votes for a 5-cent fare under a plan where deficits may be covered by general taxation is very likely to find that he is paying part of those taxes and that by the end of a year he has contributed more than would have been the case under a higher rate of fare without taxation.

When voters come to a full understanding of this fact it will not be easy to fool them. It is natural that they should want to have transportation at the lowest possible cost. The report of a municipally operated railway system sounds attractive because bookkeeping methods will often permit of disguising expenses such as taxes which other companies have to charge against the rate of fare. The turning point will come when the unconscious taxpayer realizes that he is helping the direct taxpayer to carry the burden, and to make him understand this is an important part of the educational work to be done by the companies.

A Full Understanding Should Precede Wage Readjustment

EVERY electric railway company will soon have to decide what it will do in the matter of wage readjustment. Unfortunately for the industry, not much attention has been paid to this subject in recent association meetings, national or sectional, in open session or private conference. The need for such a discussion is not that there shall be concerted action, but there should be an understanding by individual managements of the principles which ought to govern, because the policy followed in one city will undoubtedly have effect elsewhere.

Wage reductions will probably come first with two classes of roads. One consists of those properties where strong labor action has forced the scale to unusually high levels. The second comprises those companies where the fare increases have been slight. In the former case, the discrepancy between the railway wages and those paid in other industries will be so marked that public opinion as well as the self-interest of the company will require a reduction. In the latter case the cut in wages will have to be made because further fare increases will be difficult to obtain.

The fact that wages in other lines are being reduced is not necessarily a good reason for electric railways to do the same immediately or reduce to the same extent. A delay will help to secure and hold to the company the better grade of men obtainable under a generous scale and make up for some of the poor labor that had to be put up with when the high wages of industrials robbed the railways of many of their best workmen.

In the case of companies operating under a service-at-cost franchise, a reduction of wages would lower the rate of fare automatically, and eventually the same result will follow with companies not having a service-at-cost franchise, if a profit is being made. It would be eminently fair, however, for the railways to have a certain amount of economic lag between reduced expenses and reduced income, just as there was such a lag during the upward drive of prices. Such an interval or period of grace on the downward part of the cycle would permit the companies to do something to rehabilitate their physical properties, something now greatly needed. Such a policy in turn would help to keep down fares in the future, because the most economical operation is obtained with property well maintained. In the final analysis, of course, the wages paid by electric railways will have to be based largely on the market price for work of that same general nature, and it should be remembered that while employees for platform service have to meet rather strict physical, moral and mental standards, the period of apprenticeship required to qualify for work is far less than in what are known as the skilled trades. This does not mean that electric railway wages will soon be at their pre-war level or even will be reduced proportionately to the reductions in wages in other industries. Such a condition would be unfortunate, because, judged by the average turnover on many electric railways before the war, the wages for platform men at that time were too low.

As has been pointed out in these columns, the fact that wages will have to be reduced does not mean that a horizontal reduction of the present scale proportionate with the decline in the cost of living should necessarily be made or that all of the reduction should be made by a horizontal cut. Much can be done in the way of tightening up on bonus time, on lay-over time and on time paid for but not worked, and perhaps by a slight adjustment of the maximum and minimum day. If such changes will mean greater efficiency, labor should be for them. Another relief measure would be to add several lower steps to the present scale of wages, as by beginning new men at a lower scale and lengthening out the period of service before the present high rates are reached. A longer scale period than the one or two years established by the War Labor Board is justified, and this is one way of securing it.

Whatever is done, managements should not be without a thorough appreciation of the labor point of view. It is believed that a reasonable reduction can be secured without trouble, but the companies should not attempt a return to those days of extremely low pay when service was given at the expense of the employees and of maintenance and depreciation reserve.

Let the Suburban Roads Do the Suburban Traffic

AT THIS time last year there was a shortage of approximately 150,000 freight cars and shippers were urged to economize by taking the shortest time possible for loading and unloading cars and shipping full carloads. According to a recent report of the Car Service Committee to the Interstate Commerce Commission there were at that time 358,065 surplus freight cars on the railroads of the country, and it is obvious to any one who does much traveling that the passenger business has also fallen off. With these conditions it would not be surprising if the steam railroads, which in the past have affected to scorn the short-distance suburban business, would make an attempt to cultivate it.

Such a plan would not be in the interest of real economy. The steam railroads, with the expensive terminals which they use for this short distance travel, undoubtedly lose money on it when it requires facilities which otherwise could be used for the profitable part of their business, long-distance passenger and freight haulage. On the other hand, the interurban electric lines can conduct this business at a profit. Steam railroads which now have a commuter business may not be prepared to abandon it, but further investment, particularly in property like terminals, which cannot be used elsewhere, should be considered askance.

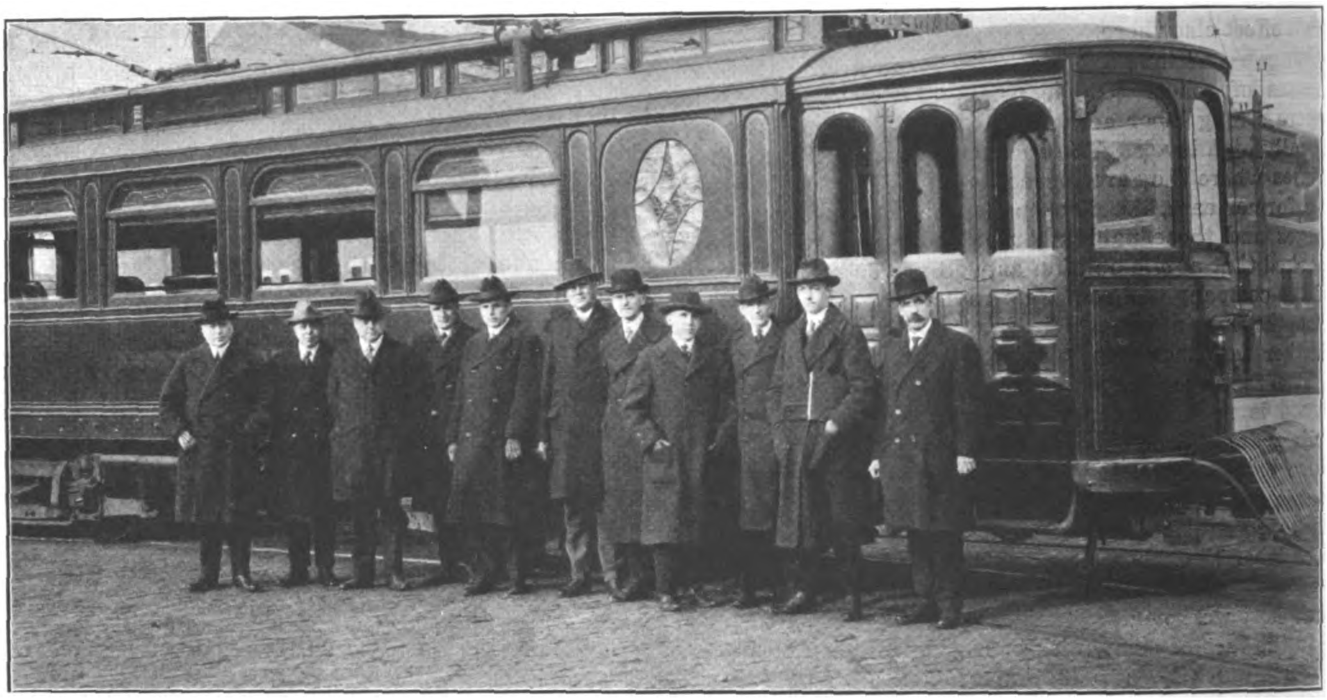
Quotation from the Federal Electric Railways Commission Report

No. 10

THE full co-operation of labor is essential to the highest prosperity and the usefulness of the industry. The employees engaged in this occupation should have a living wage and humane hours of labor and working conditions. They should have the right to deal collectively with their employers, through committees or representatives of their own selection. All labor disputes should be settled voluntarily or by arbitration, and the award of such a board should be final and binding upon both parties. It is intolerable that the transportation service of a city should be subject to occasional paralysis, whether by strikes or by lockouts.

Better Transportation for Camden

A New Organization Takes Hold of the Southern Division of the Public Service Railway of New Jersey — An Active Effort Being Made to Promote a Spirit of Co-operation in Personnel of the Division—Formation of a Company Section of American Association Considered Highly Desirable in This Connection



THE SERVICE COMMITTEE IN FRONT OF ITS MOVABLE MEETING QUARTERS
Left to right, T. E. Babcock, F. B. Summers, H. C. Stevenson, Martin Schreiber, Chairman; R. A. McArthur, J. Walter Wright, J. Hanf, J. N. Waters, C. V. Wallace, G. A. Rothery, Secretary, and William H. Wright

THE Southern Division of the Public Service Railway, which centers in Camden, N. J., is in many ways like a detached property because it is separated by a considerable distance from the divisions which comprise the main mileage of the property. During the war the shipbuilding and other abnormally augmented industries brought unusual prosperity to the district, which, however, did not extend to the railway company, but it is now suffering somewhat of a post-war slump. However, there are many substantial manufacturing properties within the Southern Division territory, such as that of the Victor Talking Machine Company, and there is heavy traffic to and from Philadelphia, a part of the suburbs of which the Camden region is.

The Southern Division operates 155 cars and employs about 1,000 persons all told. Last summer Martin Schreiber, chief engineer of the company, was appointed manager of this division, with sufficient authority to apply such methods as he deems wise. Since then he has had opportunity to apply a number of them on the property.

The groundwork of the scheme now under way in Camden was first explained in a paper by Mr. Schreiber before the convention of the American Electric Railway Association at Atlantic City last October. The plan is based first on a carefully selected, progressive, supervising organization. This organization is so co-ordinated with the rank and file that every man has a voice in the creating of the orders under which he labors, as well as in the carrying out of his particular part of the transportation work.

The organization "heads up" in a "service committee," comprising principally the heads of departments. This meets weekly for the purpose of discussing principles and details of the work of the several departments. The meeting place is a special car belonging to the division, which is taken out over one line at a time, visiting points of administrative interest. The meetings consume about three hours on the morning of Friday, the day preceding the weekly conference of general department heads at Newark, which is attended by Mr. Schreiber.

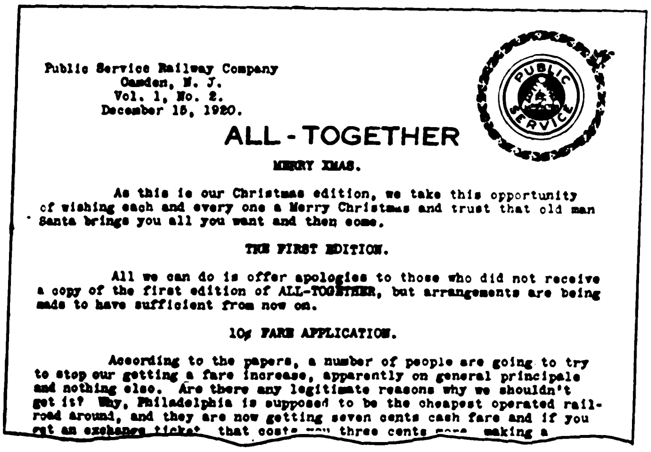
MAKE-UP OF SERVICE COMMITTEE

The make-up of the service committee at present comprises, in addition to the manager, the following: R. A. McArthur, superintendent of transportation; T. E. Babcock, claim agent; J. Hanf, master mechanic; J. W. Wright, superintendent of maintenance of way; C. V. Wallace, superintendent of employment and instruction; F. B. Summers, storekeeper; J. N. Waters, engineer; W. H. Wright, superintendent of distribution, and G. A. Rothery, chief clerk and editor of "All-Together," an employees' periodical leaflet. H. C. Stevenson, who is assistant to the president and is in charge of public relations of the Southern Division, also sits in with the committee.

Mr. Rothery acts as secretary of the service committee meetings and keeps full and accurate minutes, which are of great value in conserving the many excellent suggestions made by heads of departments.

SPEEDING LOADING AT THE FERRY TERMINAL

The point of greatest traffic congestion on the Southern Division is at the Philadelphia ferry terminal in Camden. Here many of the lines terminate, and the installation of a prepayment inclosure for the two loop terminals is under consideration. In the meantime, however, the handling of traffic is being facilitated by the sale of fare receipts on the street to expedite rapid boarding of the prepayment cars. This plan, which originated in Camden, has proved so successful that it has been adopted elsewhere at congested points on the system.



Public Service Railway Company
Camden, N. J.
Vol. 1, No. 2.
December 15, 1920.

ALL - TOGETHER

MERRY XMAS.

As this is our Christmas edition, we take this opportunity of wishing each and every one a Merry Christmas and trust that old man Santa brings you all you want and then some.

THE FIRST EDITION.

All we can do is offer apologies to those who did not receive a copy of the first edition of ALL-TOGETHER, but arrangements are being made to have sufficient from now on.

10¢ FARE APPLICATION.

According to the papers, a number of people are going to try to stop our getting a fare increase, apparently on general principals and nothing else. Are there any legitimate reasons why we shouldn't get it? Why, Philadelphia is supposed to be the cheapest operated railroad around, and they are now getting seven cents cash fare and if you get an exchange ticket that costs you three cents more, making a

A SMALL BUT AMBITIOUS EMPLOYEES' BULLETIN

One receipt booth was also erected, and at present four street ticket, or receipt, sellers are employed from 3 p.m. through the rush hour. On the first day that this plan was inaugurated 700 tickets were sold, and the number increased rapidly to about 8,000 on Saturdays. The result was a reduction of the time of loading to 1.47 seconds per passenger. A count showed that 80 per cent of the patrons now use the tickets. When this result was ascertained the company posted the following notice at the ferry terminal:

> **Co-operation Wins**
>
> An official record taken at the ferries shows an average loading time of 1.47 seconds per passenger. This means shorter headway, faster time and improved service.
>
> Public co-operation made this possible.
>
> THANK YOU
>
> *Public Service Railway*

One thing that the management has resolved to do is to reduce the time lost through car delays. To this end an emergency truck, a Maxwell line truck, has been detailed to duty for emergencies. It is manned with a crew of three, representing respectively the track, shop and line departments, although it is under the supervision of the distribution department. It is the duty of this crew to repair promptly to the scene of any delay and by the use of expert knowledge clear up the blockade.

The service committee is endeavoring to formulate a logical publicity policy. Under war conditions the service became unpopular, due partly to the influx of aliens to the war industries. It became quite the thing to do to "knock" Public Service. To counteract this the committee is endeavoring to take the standpoint of the public and has adopted an emblem containing the slogan "Public Service—Safety, Service, Satisfaction." The last three words were chosen because they represent what the public wants of the railway and what the railway is trying to furnish.

AN ALL-ROUND EMPLOYMENT DEPARTMENT

Coming now to the employees, the first point of interest is the department of employment and instruction for the entire body of employees. It is what might properly be called a personnel department, and is highly organized. This department is in charge of C. V. Wallace, who previously was engaged in somewhat similar work for the Philadelphia Rapid Transit Company.

The functions of the department are these: (1) Development of sources and channels of labor supply; (2) selection of suitable applicants for positions on requisition by a head of a department; (3) introduction of new employees into service; (4) supervision of training and following up of new employees; (5) transfers and promotions as between departments; (6) maintenance of individual records of all employees with issuance of badges and other forms of identification; (7) maintenance of close relationship with the medical department; (8) maintenance of an active interest in all activities of a social nature; (9) the interviewing of all employees leaving service with a view to conserving labor and giving data for analysis of causes of leaving.

TYPICAL SHOP INTERIOR, PUBLIC SERVICE RAILWAY, CAMDEN

The record cards for the several classes of employees are distinguished by colors, but are identical in form. Mr. Wallace has devised a complete set of record forms for his work, some of which have not been used before.

On the Southern Division it is the practice to play one evening a month. Two minstrel shows have been given at the Camden carhouse. They proved very popular and served to create a friendly feeling among the employees. As this article is in preparation a masquerade ball is being planned.

The service committee desires to get suggestions from the men regarding improvements in the service and has prepared a form entitled the "Co-workers' Suggestion Blank," copies of which have been distributed under the auspices of the employees' union. The union local also is endeavoring to co-operate with the management through honor and safety committees in every possible way. The receipt of every suggestion received is acknowledged and those that are useful are noted in the service committee minutes.

THE PUBLIC SERVICE HEADQUARTERS IN CAMDEN

It was noted above that H. C. Stevenson, in charge of public relations, also is a member of the service committee. The closest co-operation is thus maintained between the public relations and the actual operation of the property. It is the policy of the service committee to consider the necessity of gaining and holding confidence and good will of the public as well as actually furnishing service. For example, sometimes the service committee sits as a public relations committee to consider some emergency matter, like the company's application for a 10-cent fare. Wherever possible, representatives of the service committee appear personally at meetings of municipal and civic bodies throughout the division to present the company's side of the trolley question.

The employees' leaflet, "All-Together," that has been mentioned, is simply a letter multigraphed on both sides and sent to the men's homes. It discusses in an intimate way the problems of the property and has a human touch through mention of personal happenings. "All-Together" is also a strong factor in producing better teamwork and better public relations. The following is an excerpt from a recent issue:

> Teamwork between the company and its employees, having shown good results in improving discipline, which is the backbone of safe and satisfactory service, let us now make a drive for future co-operation between the company and the people. Please tell our patrons that the company welcomes any communication by word or by letter of any complaint, criticism or commendation about the railway and such communication will be acknowledged and receive sincere, careful and intelligent consideration. Of course, a letter would be preferred, but verbal communications for example may be reported by the trainmen to the inspector, who will be glad properly to pass the word along. Cultivate the feeling that the company wants to please its patrons.

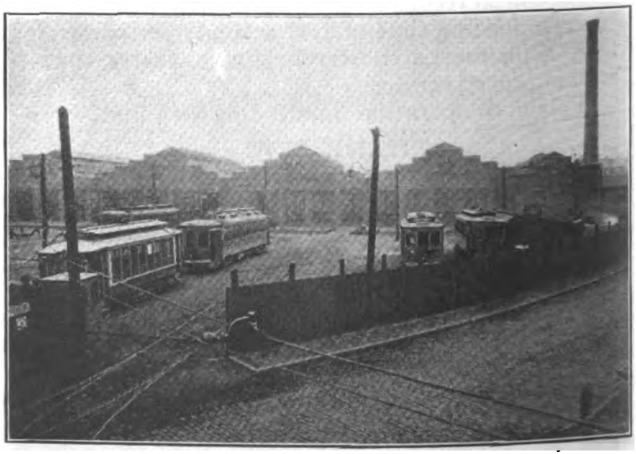
In order that the service committee shall be kept up to date on public opinion as far as possible, clippings are made regarding matters pertaining to the trolley company, in the office of the assistant to the president, and each clipping is pasted on a standard letter-size sheet of paper. The clipping is sent in order to each member of the service committee, who initials it, and it is finally returned to the original office for file and reference.

The service committee has also established what is known as the "Booster File." Any commendatory letters received, for one cause or another, are filed alphabetically by municipalities.

A company section of the American Electric Railway Association has also been formed at Camden, with the title "Public Service Railway Camden Section." It was organized with seventy-five members. C. V. Wallace, superintendent of employment and instruction, is president. The service committee believes that the key-word of the section is "Education," and education to the effect that no boss can be bigger than his men collectively nor any company better than its employees. The company section will be an open forum where all subjects, including operating as well as public relations, will be discussed. The men will be handed the truth first hand and the company section is expected to have its good effect in promoting better public relations.

Accident reduction is another problem before the

A CAMDEN STREET SCENE, FEATURING PUBLIC SERVICE ROLLING STOCK



CAMDEN SHOPS OF PUBLIC SERVICE RAILWAY, IN CHARGE OF J. HANF service committee. Already some things have been done and accidents have been reduced through better supervision. The important plans thus far used are these:

Standardized warning signs have been placed near all curves. Alternate white and black bands have been placed on the poles, up to five poles from the curve, the number of bands indicating the number of poles that the curve is away.

A safety bulletin board has been installed at the office of each department head for the posting of timely notices.

Safety signs have been placed on the car doors.

The service committee has also given attention to inspection during the "wee, small hours." Formerly there was no inspection from 1 to 6 a.m. Now a night inspector, furnished with an automobile, appears at any point of the division without warning. Any infraction of the rules is promptly reported and the offender is disciplined the next morning.

Inspectors are also furnished with punches having characteristic forms, which are used by them in inspecting conductors' returns. Examination of the sheets thus shows by the punchings just what each inspector has done. The following instructions to inspectors give more details regarding this matter:

On Dec. 6 a number punch will be added to your equipment, which is to be used by you when inspecting the work of conductors.

The day card used by the conductor should be examined thoroughly to see if same is properly filled out in every detail.

Give particular attention to the columns marked "Schedule Time" and "Leaving Time" as well as columns "From" and "To," and if cars operate from different terminals than scheduled, see that proper note of same is made on day card.

Pay close attention to the reverse side of day card, noting whether conductor has properly filled in car and farebox numbers and check the readings of registers with commencing numbers on car record.

Note whether conductor is making a proper record of letter carriers, policemen and firemen on the reverse side of day card.

After day card has been properly inspected and omissions entered on errors corrected, punch same in the column marked "Closing Number of Transfer" in space of particular trip in which you have boarded car, being careful not to cancel any figures appearing thereon.

IMPORTANT

When making a register check or box check for conductor's work and conductor offers free passes or 7-cent tickets as part of his work, punch one impression in center of these tickets, which will signify you have inspected same, thereby preventing conductor from utilizing these tickets and substituting them for cash fares received on later trips.

This punch can be made an important adjunct in your work and with proper use of same, a considerable number of irregularities on the part of conductors will be overcome.

A successful effort has been made to reduce pull-ins, which formerly occurred often on slight provocation. Block numbers have also been placed on both ends of each car to identify it more readily.

The service committee also believes that it would be a paying proposition to make provision for pressing the uniforms of the platform men on account of the better impression that would be made upon the public.

BUY TICKETS HERE
AVOID DELAY BUY TICKETS BEFORE BOARDING CARS
CRAMER HILL
FEDERAL

SCENE AT THE FERRY TERMINAL, CAMDEN, WITH TICKET BOOTH AND COLLECTOR IN EVIDENCE

Measuring and Removing Rail Corrugation

FRANZ SCHREY, civil engineer and head inspector of the Vienna (Austria) Municipal Tramways, has just issued a twenty-page pamphlet on the subject of rail corrugation. He describes the use of a motor-car grinding apparatus, employing a sliding stone device which is effective in eliminating corrugations.

Of special interest is Mr. Schrey's account of an instrument for measuring and recording corrugations on an enlarged scale. It consists of a carriage, which slides on a long bar held on the rail. The carriage carries on the top an arm, with a tracing point on the outer end, and below a plunger which makes contact with the rail surface. The upper end of the plunger pushes upward in the recording arm and is placed at such a point with relation thereto as to give the desired amplification of motion at the end of the lever. The plunger is forced downward by means of a spring and the recording arm is suitably weighted.

Electrification in Central Europe

The Question of System Is Being Studied in All Countries—Switzerland and Austria Are the Only Ones that Are Extending Their Single-Phase Lines — Scarcity of Coal Makes Electrification Highly Desirable — A Résumé Is Published of the Conditions that Exist in Germany, Sweden, Norway, Holland and Italy

By E. C. ZEHME
Berlin, Germany

INTIMATELY involved with the present status of the electrification of the principal railroads in the central European countries is the unanswered question as to the best kind of current to be used. It has been customary to consider Germany, Switzerland, Austria and Sweden as the advocates of the single-phase system, but they are not so today. Only Switzerland and Austria are at present extending their single-phase roads, whereas no definite conclusions have as yet been reached as to a standard system in Germany, Sweden, Norway and Holland, and even in Italy. The renewed doubts as to the best system are aroused by the conspicuous success in the operation of the American high-voltage, direct-current railways. The final preference in France for the direct-current system is due to the same cause, while the direct-current has also come off victorious in Great Britain. Some details of the situation in each of the middle European countries mentioned will be of interest.

GERMANY

For the present the electrification of German main railroads has been confined to two lines, the Magdeburg-Halle-Leipzig lines via Dessau and Bitterfeld, with 108 miles of route and 346 miles of single track, and the Lauban-Königszelt line, with 171 miles of route or 311 miles of single track. Both of these lines suffered badly during the war, and only the small stretch between Königszelt and Dittersbach was in electric operation. Strenuous efforts are now being made to re-establish operation on these lines, the principal difficulty being with the overhead wire. During the war all copper wires were removed and are now being replaced, but as an experiment part of the overhead is being restored with iron wire. Regular operation has begun between Königszelt and Hirschberg on the Silesian Mountain roads, and it is expected that trains will be running as far as Lauban during the present spring.

The necessary authorization for the connections east to Breslau and west to Görlitz has been issued. Service will undoubtedly be begun very soon on the Saxonian line between Magdeburg and Leipzig.

The decision made in 1913 to electrify the entire Berlin rapid transit system is now beginning to bear fruit.*

At first the two northbound lines between Berlin and Hermsdorf and Berlin and Bernau respectively will be electrified.

As on all present state railroads, the single-phase system has been adopted here, to avoid complication of systems. However, as the entire Berlin rapid transit system in itself is detached from the State Railways and could be operated independently electrically, taking power from the main railway power line, it would seem as this would not be a controlling consideration.

Obviously, the war greatly retarded the development of electrification on the main railroads in Germany. This was undoubtedly partly due also to the experimentation which was indulged in by the former State Railway Department administration. The experiments referred to included the use of locomotives for urban rapid transit rather than multiple-unit motor cars, the use of short cog rails to assist in starting trains to offset the small adhesive weight of the locomotive, the use of single contact points instead of a continuous wire for power supply, with contact-making strips the length of the train, and finally a scheme for a hydraulic transmission gear between the motor and the locomotive axle. Several of these ideas were incorporated in experimental equipment.

Recently doubts have been advanced from several sides as to the practicability of the single-phase system for the main railroads of Germany. An induced voltage of 4,000 has been effected in the 50 miles of the feeder line in the cables carrying low voltage signal current on the Silesian Mountain road, destroying the cable rapidly. Furthermore, the locomotives with their single-phase commutator motors placed high and driving the wheels through connecting rods are at present requiring excessive maintenance work. Nevertheless the authorities still manifest a preference for the single-phase system and have decided to call an international congress this year in Germany to go over the whole matter, presumably hoping that the present viewpoint of the Prussian State Railways in regard to the system will be justified.

Skepticism has developed also with regard to the advisability of using electric locomotives on the Berlin rapid transit lines, and some test trains consisting of motor cars and trailers will be built to demonstrate locally the practicability of the system which elsewhere has been long established.

There are now all told about 472 miles of electrified lines, or 940 miles of single track, on the main roads in operation in Germany; that is, in Prussia, Bavaria and Baden. These installations were all made by German electrical manufacturers.

AUSTRIA

The electrification bureau of Austria is actively at work, and a bill has been introduced in the national congress for the use of electric traction on the state railways, embracing and standardizing all existing individual plans. This bill, which has now been passed, rules that, conforming with the laws passed Dec. 20, 1919, and May 20, 1920, all work already under way should be actively pushed so as to permit electric operation if possible not later than June 30, 1925, on the following lines:

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*See issue of ELECTRIC RAILWAY JOURNAL for July 3, 1920, page 20.

1. Arlberg line (Innsbruck-Landeck-Bludenz) and Vorarlberg line (Bludenz-Bregenz-Lindau) and branch lines.
2. Salzkammergut line (Steinach-Irdning-Attnang-Puchheim lines).
3. West line (Salzburg-Schwarzach-St. Veit-Wörgl lines).
4. Tauern line (Schwarzach-St. Veit-Spittal-Mill-Stättersee lines).

The total length of these lines will be 363 miles, and with the extensions which have been planned for later addition, the total will be 1,108 miles, or 40 per cent of all state roads operated in Austria.

Of these lines, 658 miles are single track and 450 miles are double track.

The electrification of these lines is considered of urgent importance, because Austria today produces only 16 per cent of the coal which it requires, and electrification would permit the saving of 50 per cent of the demand. Under the influence of Prussia, the Austrian State Railway Administration has adopted single phase with 15,000-volt contact line potential at 16⅔ cycles.

The power supply will be taken from the newly erected station at the Spullersee (for the Arlberg line), at the Stubachtal and on the Mallwitz, and the hydro-electric plant on the Rutzbach (Mittenwald line) will be enlarged. The Salzkammergut road will be supplied from the existing power plant.

The electrification of the Arlberg line, with its maximum grade of more than 3 per cent, has already been begun. The locomotives have been ordered from German-Austrian firms. In these the weight upon any one shaft will not exceed 14½ metric tons, and the total weight will be 2.1 tons per foot of over-all length. On the freight locomotives the single-phase commutator motors will drive the coupled axles by means of gears. On the passenger locomotives the motors are geared to a jackshaft which is rod-connected with the drivers.

Omitting the lines in contemplation, there are 250 miles of route of electrified main lines in operation in Austria, or 358 miles of single track. Of these two-thirds are operated single phase and one-third direct current.

SWEDEN AND NORWAY

The present total length of electrified railway in Sweden is 90 miles, of which 81 miles is single phase and the remainder direct current. In Norway the respective mileages are 45, 28½ and 16½.

The Swedish State Railways have actively pushed their electrification program. The Riksgränsen Road from Kiruna to the Swedish-Norwegian border in the north has been in operation with its heavy ore trains since 1914. It is a single-phase road operated at 15,000 volts, 15 cycles, and takes its power from the Porjus hydro-electric station.

Electrification of the southern extension of this line from Kiruna to Lulea, 190 miles, is at present under construction. The northern extension from the border to the port of Narvik is being planned by the Norwegian State Railway. The electrical equipment for this will be furnished by Siemens-Schuckert and the Allgemeine-Elektricitäts-Gesellschaft.

The Swedish State Railways plan to electrify additional lines, principally in the south, and primarily for passenger traffic. Here the question of system has again been studied very carefully and the following estimates have been reached as to comparative merits of: Three-phase rotary converters, converting alternating current to direct current; (b) three-phase motor generators, converting three phase to single phase; (c) straight single phase. The over-all efficiency from power plants to train is placed at 54 per cent, 55 per cent and 64.7 per cent in the three cases respectively. The corresponding building investment would be 100 per cent, 94.5 per cent and 97.2 per cent, while the operating cost would be 13.2 per cent, 13 per cent and 12.6 per cent.

In Sweden, although it would be possible to obtain power from the general three-phase system of the country, it is considered safer, although more expensive, to generate the railway power in separate plants.

Although the single-phase system is estimated to be somewhat more economical than the other, the difference is small and is being considered in connection with the inductive disturbances in telegraph and telephone lines caused by the alternating-current operation. A special commission on this subject has studied the phenomena carefully, together with the remedy for the trouble, and has presented a long report. This is unfavorable to the single-phase system. The matter is now being taken up again because the Swedish Reichstag has accepted a project to electrify the Stockholm-Gothenburg line. In accepting an alternating-current project for this line, the understanding was that a satisfactory method be found to prevent disturbance in existing telegraph and telephone lines.

HOLLAND

The Holland State Railways intend to electrify all their lines and are now debating the question of system. To date 32 miles of track have been electrified, 12 with high-tension direct current (1,200 volts) and 20.5, from Rotterdam to Scheveningen, with 10,000 volts single-phase current, 25 cycles. Both of the present electrifications are old and cannot be used as examples for new projects. The single-phase line was built in 1908 and the direct-current line in 1911, both by the Siemens-Schuckert works.

The Holland State Railways have appointed a commission to study the railway systems of the world, including the American direct-current lines and the Swiss alternating-current systems, with a view to prescribing for the country's needs, with due reference to the lack of coal and the necessity for avoiding inductive disturbances.

ITALY

Italy is a country lacking coal but rich in water power, and hence has long been interested in electrification of its railways. Today there is an electrified track mileage of 640, of which 265 are operated by direct current, 198 by three-phase current and the remainder by single-phase current.

The principal lines are those using three phase, a field in which Italy did pioneer work. The foundation for this system was laid by Ganz & Company (Budapest), with the Valtellina line employing 3,000 volts and 15 cycles, installed for the Italian State Railways. This work was continued by the Westinghouse Company at Vado, Ligure, under the direction of Mr. Kando, while Swiss builders equipped the Simplon line, contributing to this development.

The direct-current lines are mostly west of Milan, toward Varese. The single-phase roads center around Rome and Naples, but a few short three-phase lines can also be found in northern Italy.

The present critical coal situation has brought electrification to the front with a new impetus. A program has been prepared for the electrical equipment of all the principal lines, of a combined length of 1,160 miles, which will eventually give Italy a total of 1,860 miles of electrified road. The first two groups of 826 miles will be built by the state and include lines near Genoa, Trieste, Pisa, Parma and Verona, all in northern Italy. The third group, involving 505 miles, will be built by private capital. Up to the present Italy has favored the three-phase system and from the records it must be admitted that it has worked out very well, especially on account of the success of regeneration on the southern slope of the Alps. As a result, this system will be used for the present, but the possibility of changing over to another system is being kept in mind. Good results are expected to follow the close co-operation of the government with the privately built railways.

When the Valtellina road was electrified (1900-1902), followed by the Simplon tunnel (1905), the use of gears between motor and axles had not yet come into favor, and in the Valtellina contract gears were specifically excluded. Later, such good results have been achieved with gears, as for example on the Lötschberg electrification and in America, that they will be considered in future electrification plans of Italian railways. This will permit the use of a higher frequency and possibly a current supply from existing power plants. On two lines near Rome three-phase current of a frequency higher than fifteen cycles will be used.

SWITZERLAND

The country of Switzerland was designed by nature for electric traction, and here there is an electrified mileage of 535, divided as follows: 177.5, high voltage direct current; 71.5, three phase, and 286 miles single phase. The government's commission for the study of the electrification of the federal railways has recommended the use of single phase at 15,000 volts, with 15 to 16⅔ cycles. This was adopted more than four years ago. The system was first used by the Oerlikon Company on the experimental track between Seebach and Wettingen in 1905 to 1907 and was later adopted by the Prussian State Railways.

The Swiss Federal Railways constitute 75 per cent of all the railways in the country. In 1913 it was decided to electrify the Gotthard line, after the Bernese Alpine system had electrified the Lötschberg line in the same year with 15,000 volts, 15 cycles. The first locomotives for this road were of Oerlikon make.

In 1918 the Federal Railways took up a large electrification program and, as previously explained in this paper, divided the entire mileage into three groups. Of these the first comprises 705 miles, of which 14 miles have already been electrified. The second group involves a mileage of 376, and the third one of 637, a grand total still to be electrified of 1,704.

In the original plan a period of ten years was allowed for the electrification of each group, but this will undoubtedly be modified. On July 1, 1920, the first freight train went through the Gotthard tunnel, and on Sept. 15, 1920, the first passenger train went through. Regular operation experienced a setback owing to an accident in the Ritom power house. After repairs, service was resumed in November, 1920. The locomotives for the Gotthard tunnel were built in part by the Oerlikon works and in part by Brown, Boveri & Company. (See ELECTRIC RAILWAY JOURNAL, Aug. 7, 1920, page 256.)

Among the important private electrifications in Switzerland may be mentioned the Rhaetian Railway, opened in 1920, and the Bernese Alpine Railway.

Cost of Pavement Maintenance and Resurfacing in Chicago

INCLUDED in the forty-fourth annual report of the Department of Public Works of Chicago for the year 1919 are some figures on the cost of maintenance and resurfacing various kinds of pavements. By "repair" in the following table is meant the patching of holes, cracks, etc., as they appear, while resurfacing is the tearing up the surface and relaying:

PAVEMENT REPAIR COSTS

	Cost per Square Yard
Sheet Asphalt	$1.94
Brick	1.53
Creosote block	2.25
Water-bound macadam-oiled	0.45
Asphaltic-concrete	1.90
Granite block	0.96

RESURFACING COSTS

	Cost per Square Yard
Asphaltic-concrete	$1.94
Macadam	1.69

The cost of asphalt delivered to the job obtained by averaging the outputs of three separate plants is:

ASPHALT COSTS

	Cost per Ton
Top	$9.46
Binder	6.88
Asphaltic-concrete	7.28

The average cost of oiling macadam pavements in Chicago was $0.013 per square yard.

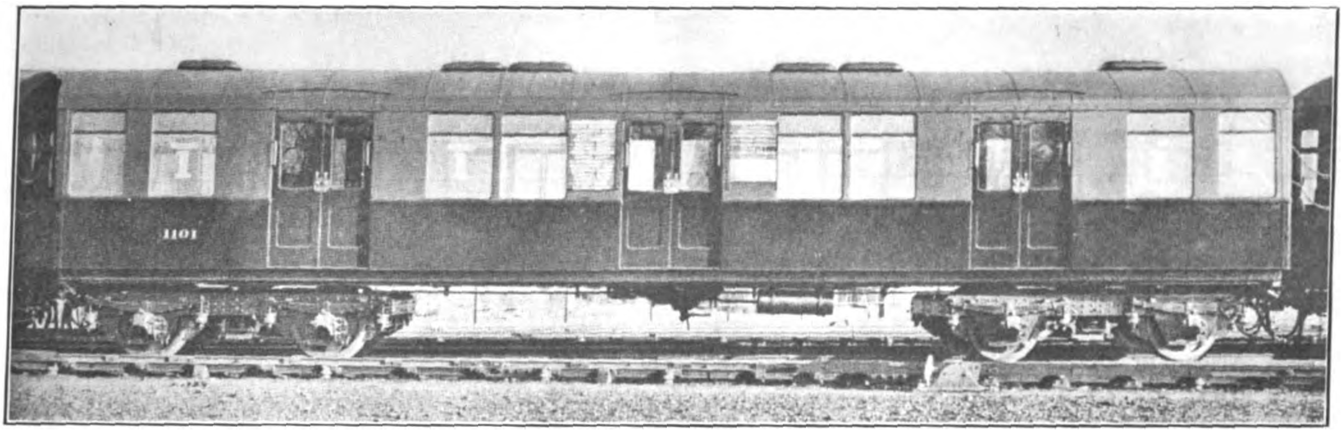
Jitney or Bus Competition

J. F. McLAUGHLIN, writing under the above caption in the *Stone & Webster Journal* for February, 1921, states that during the height of the unregulated jitney craze in 1915 from 6,000 to 10,000 machines were in operation in this country. He stated that it soon became apparent to municipalities and other regulatory bodies that the unregulated jitney congests traffic, impairs the proper functioning of the street railway system, and, in fact, destroys instead of adds to the existing transportation facilities of the community, and therefore must be regulated. The development of regulation has caused in many places the complete elimination of this form of competitive transportation, so that at present there are estimated to be only from 2,000 to 3,000 jitneys operating. Three-fourths of these are charging fares in excess of 5 cents.

This competition, Mr. McLaughlin states, has been a costly experiment to many communities and traction companies, but has taught the following lessons: (1) That street railway service and jitney or bus service cannot both exist for any length of time as competitors in the same field. (2) That with jitney or bus competition the whole or a large part of a community pays a higher fare than would be necessary if the total traffic were handled by the street railway. (3) That when operated under conditions similar to the street railways, the jitney cannot meet the transportation requirements of a community as satisfactorily or as cheaply as the street railways. (4) That the jitney or bus cannot supplant the street railway as a means of supplying urban transportation.

New Type of Cars for London Subways

New Steel Rolling Stock Has Been Received by Three of the Railways Operating Rapid Transit Lines in London—These Are the Metropolitan, the Metropolitan District Railway and the London Electric Railway—More Rapid Handling of Passengers by Multi-Side Door Arrangement and Longer Trains Is Expected to Relieve Present Congestion



THE THREE-DOOR TYPE OF CAR RECENTLY ADDED TO THE DISTRICT RAILWAY

ABOUT the middle of December the London Electric Railway received the first consignment of some forty new cars of an improved design to supplement the rolling stock on the Piccadilly line. At almost the same time deliveries were begun to the Metropolitan District Railway on its order of 100 new cars from the Metropolitan Carriage, Wagon & Finance Company of Birmingham, and the Metropolitan Railway Company has just put into service one train of new cars of an improved design. The Metropolitan District Railway's order is made up of forty motor cars and sixty trailers, twelve of which have control equipment and cabs for operation. Deliveries of these cars are expected in installments at short intervals. This new equipment will be used during heavy traffic hours in eight-car trains made up of three motor cars, four trailers and one control trailer. At times of lighter traffic these trains will be cut into three- and five-car trains. The seats of the motor cars are arranged to accommodate forty, those of the control cars forty-four, and of the trailers forty-eight. The order of the Metropolitan Railway is made up of twenty motors and thirty-nine trailers. Over-all dimensions of these cars are given in the accompanying illustrations.

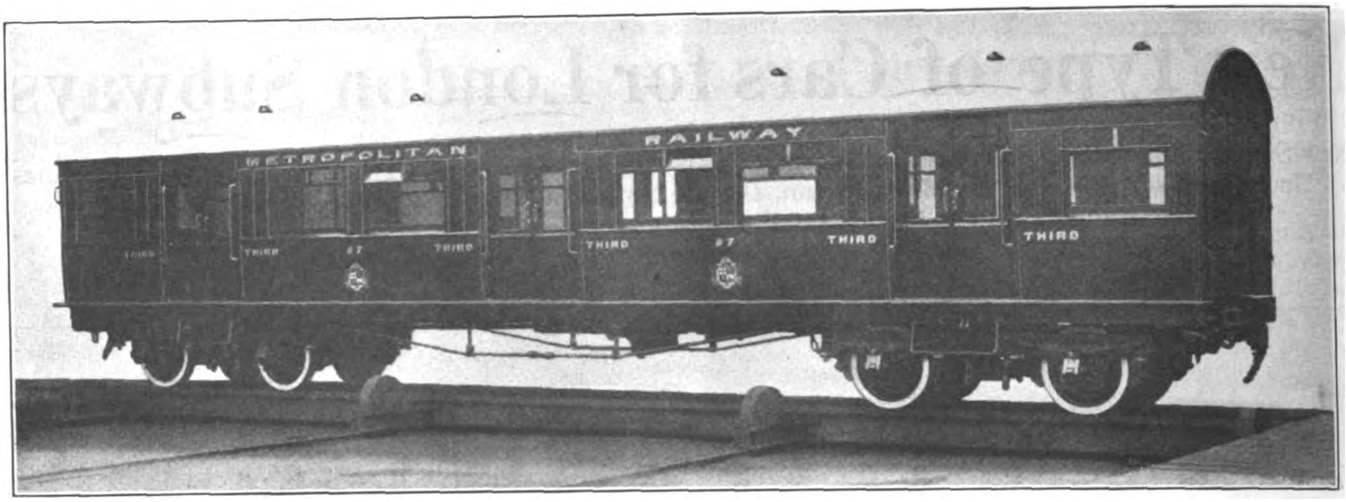
STUDIES OF DOOR ARRANGEMENT

A considerable amount of experimenting has been going on in regard to door arrangement on the London underground railways. The problem was to devise such an arrangement and number of doors in each car as would provide the most speedy entrance and exit of passengers without materially reducing the seating capacity of the car. Hitherto the multiple-unit cars of the Metropolitan Railway and the Metropolitan District Railway, which operate in open and covered cuts, have had end doors entering into vestibuled platforms and additional center side doors. On the so-called "tubes," or deep-tunnel lines, end doors furnished the only means of entrance or exit. This practice was departed from recently in the case of the joint rolling stock of the Baker Street & Waterloo Railway and the London & Northwestern Company's line from Willesden to Watford, which has side doors.

Some time ago the Metropolitan Railway found as the result of tests that during the busy periods of the day the average duration of station stops when the cars of the trains had end doors only was from forty-two to sixty-two seconds. In the case of cars with additional center side doors the time was reduced to from forty-two to thirty-nine seconds. About a year ago an experiment was made with a train having five single doors on each side of each car. Experience revealed certain disadvantages, among them being that passengers tended to congregate near the doorways and to interfere with free egress and ingress.

Based upon this experience, this last order has provided for three double doors on each side of the car and the end vestibules have been dispensed with, the space thus saved being used to give additional seating accommodations. Seats are provided for fifty passengers and are arranged transversely on both sides of the aisle, with here and there a double seat between them. The door and seating arrangement is much the same as on the cars of the New York Municipal Railway. Strap-hanging, as on other recent cars, has been abolished by the provision of steadying rails at a convenient height and by using grab handles at the aisle corners of seats.

Another innovation is the provision of a glass screen flanking each door, which, in addition to giving passengers immunity from draught, has the effect of breaking up the interior of the car into a series of semi-compartments. In connection with the design of the new cars the Metropolitan company has made modifications under which it expects that there will be a marked improvement in the heating and ventilating arrangements and in smooth running as compared to previous types. The underframe is constructed entirely of steel and the floor is covered with steel plates, over which is a layer of fireproof cement. The weight of the trailer



ONE OF THE NEW THREE-DOOR CARS FOR THE METROPOLITAN RAILWAY

car is 22 tons and that of the motor car 46 tons. The builder is the Metropolitan Carriage, Wagon & Finance Company, Birmingham.

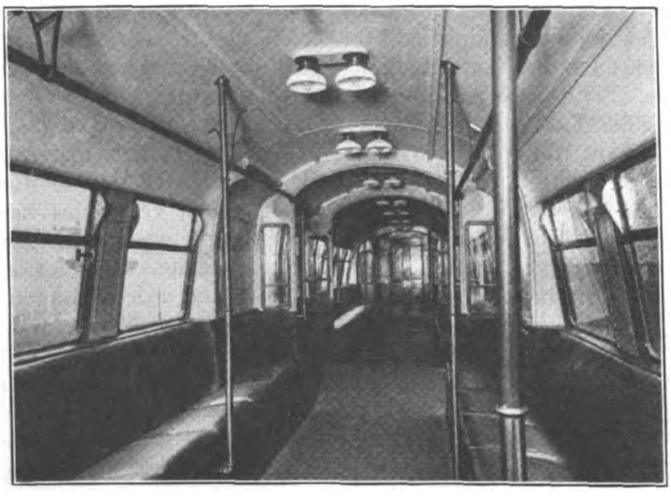
FEATURES OF DISTRICT RAILWAY'S NEW CARS

The new type of car for the Metropolitan District Railway is shown in the accompanying illustrations, and from them the new door arrangement can be seen. Each car, like those described above, has three double sliding doors per side for passenger use. On the motor cars there are also two single doors at each end into the motormen's compartment and likewise two for the one compartment of a control car. These cars are about one foot wider than the older ones, the body width extending almost to the edge of the step board of the earlier type. They exceed cars of previous design in length by a few inches. By the omission of the vestibule single doors and their replacement by double doors about 10 ft. from the car end, all seats now fall within a distance of 9 ft. from an exit, which distance, it was found, is about the maximum distance that people will go from a door. This introduction of a larger door to serve both directions will result, it is expected, in the more expeditious handling of crowds and, consequently, in a shorter stopping time.

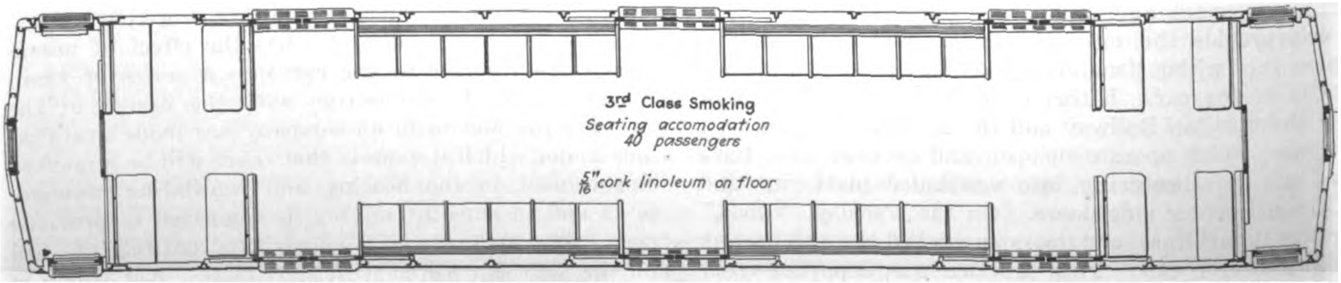
In the structural design of the bodies they have been treated as hollow girders, which results in economy of material and reduction of weight, without sacrifice of strength and stiffness. No truss-rods are employed to reinforce the car frame. Improved spring arrangements insure easy riding. The motor cars, being higher powered than their predecessors, will have both an increased speed and rate of acceleration. On "non-stop" runs a speed of 45 miles per hour can be attained. Improved braking equipment will help speed up the service by shortening the braking time.

By reason of their added width, these cars are much more roomy than the old. There are no straps, but hand rails and posts are conveniently placed at points near doorways and open spaces for the support of standing passengers. As an aid to patrons, the company has provided these cars with two sets of train indicators, one on either side of the center door. These contain the stations at which the train stops and a passenger can see at a glance before boarding the train whether or not a station stop is made at his destination.

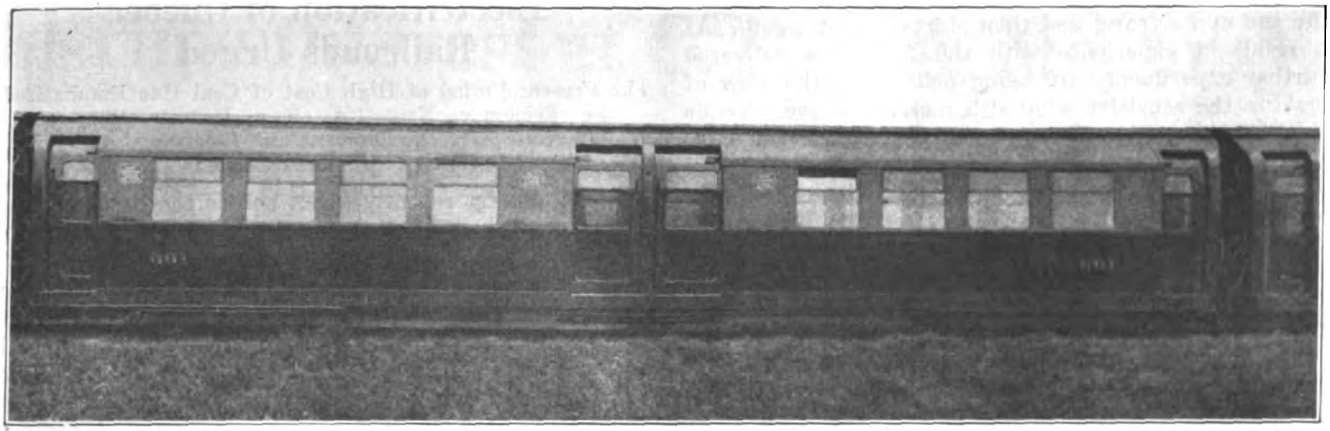
The London Electric Railway, as already mentioned, is also adding new rolling stock to its equipment of the Great Northern, Piccadilly & Brompton line. In order to increase the service on the three "tube" railways owned by the company, namely, the Great Northern, Piccadilly & Brompton, the Charing Cross, Euston & Hampstead and the Baker Street & Waterloo, all to six-car trains for the rush hours of the day, forty new



INTERIOR OF NEW PICCADILLY ROLLING STOCK



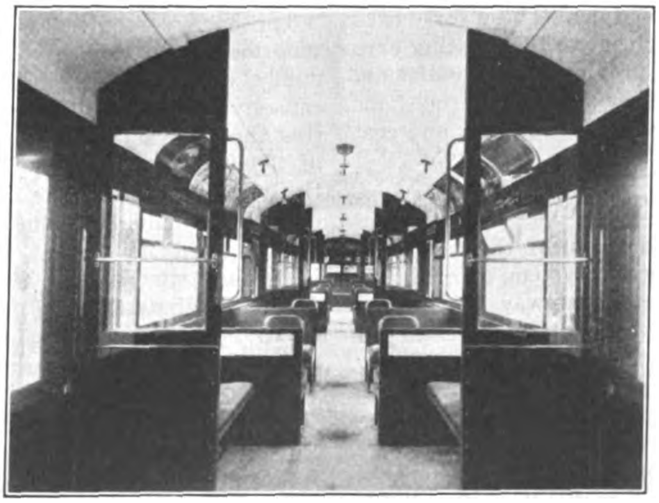
FLOOR PLAN OF METROPOLITAN DISTRICT RAILWAY'S NEW MOTOR CAR



NOTICE THE DOOR ARRANGEMENT ON THE CARS FOR PICCADILLY LINE OF THE LONDON ELECTRIC RAILWAY

trailer cars were ordered. The first four were delivered in December, and the remainder will follow at the rate of about two per week. The slow delivery of this equipment has been due to strikes and unfavorable industrial conditions. As fast as deliveries will permit, improved service is to be given by gradually building up a six-car train service during the peaks.

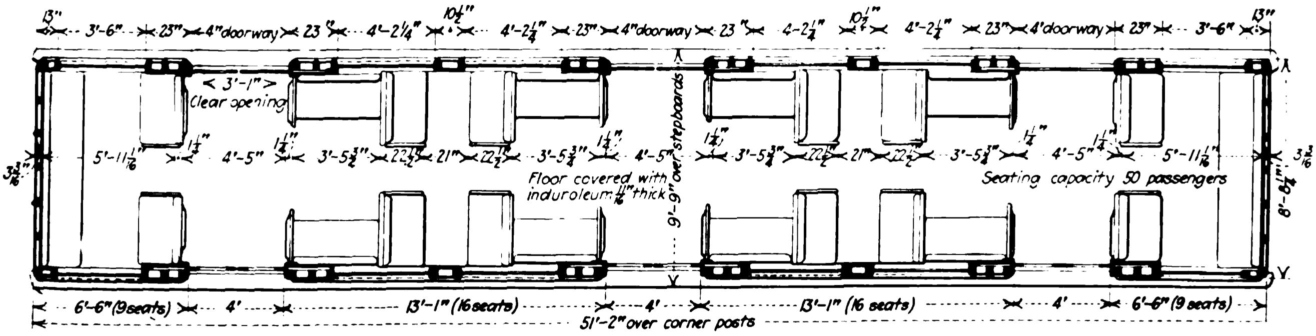
The general dimensions of the new cars for the London Electric Railway are almost identical with those now used, due to limitations imposed by tunnel section and curves. An elliptical roof replaces the clear story or monitor roof of the older cars. Special attention has been given to the lighting scheme, the lights being so arranged in groups of two down the center of the car as to provide well distributed illumination for passengers to read. Both the location of the lights and the restricted space allotted to roof advertisements have produced improved light reflection. Cross seats have been abandoned altogether, while the straps for standing passengers have been replaced by vertical poles. A great deal of attention has been devoted to the design of the seats. As a result a seat upholstered in pegamoid has been produced so that to be comfortable a passenger must sit upright and, at the same time, this decreases the tendency to block the standing area by drawing in his feet.



GENERAL VIEW OF INTERIOR OF THE METROPOLITAN'S LATEST ADDITION TO ITS EQUIPMENT

After a careful study with models of permissible door arrangements for the Piccadilly cars these have been fitted with a wide double-center door and a single door at each end. The middle door allows four people abreast to pass, while the end door permits but one person to enter or leave at the same time due to limitations imposed by the seat-box over the truck. Sliding instead of hinged doors have been adopted for the first time on "tube" railways. On account, however, of the low height of the car it has been necessary to extend the top of the door into the car roof. Because of this enforced construction, the doors could not be hung from the top in the ordinary way, but are carried on ball-bearing wheels running on the floor track, while rollers at the top act as guides.

The doors are all operated pneumatically by a device designed by the company's engineers, which presents several departures from standard practice in London, but which is similar to that followed by the New York subways. The front edge of each door is made of a resilient material on four cars already delivered. Experiments in this connection, however, have not yet been completed. As at present arranged the door edge consists of a channel section connected to a rod operating, through the door itself, to a clutch mechanism. If, while closing, the door strikes a passenger, the pushing back of the edge operates a three-way valve connected to the rod. The valve, when operated thus,



13"
3'-6"
23"
4" doorway
23"
4'-2¼"
10½"
4'-2¼"
23"
4" doorway
23"
4'-2¼"
10½"
4'-2¼"
23"
4' doorway
23"
3'-6"
13"
3'-1" Clear opening
5'-11$\frac{1}{16}$"
1¼"
4'-5"
1¼"
3'-5¾"
22½"
21"
22½"
3'-5¾"
1¼"
4'-5"
9'-9" over stepboards
1¼"
3'-5¾"
22½"
21"
22½"
3'-5¾"
1¼"
4'-5"
1¼"
5'-11$\frac{1}{16}$"
3$\frac{3}{16}$"
3$\frac{3}{16}$"
Floor covered with induroleum $\frac{1}{16}$" thick
Seating capacity 50 passengers
8'-8½"
X
Y
X
Y
6'-6" (9 seats)
4'
13'-1" (16 seats)
4'
13'-1" (16 seats)
4'
6'-6" (9 seats)
51'-2" over corner posts

FLOOR PLAN OF METROPOLITAN TRAILER

reverses the direction of the door, which goes back to the end of its travel and then starts closing again. As a result of experience with the four cars delivered further experiments are being made with the view of making the sensitive edge still more sensitive. To do this, however, it is preferable to perfect the comparatively simple mechanical device that is already in use than to resort to some more complicated electric apparatus.

It is hoped with trains made up of these new cars to reduce the number of attendants other than the motorman to two per train, one at the front door of the rear car and one at the rear door of the forward motor car. Now five gatemen are employed with a six-car train, but under the new method the rear gateman will close all doors except the rear door on the front motor car, which is separately controlled by the other gateman. On each door is fitted a brightly painted yellow semaphore which juts out horizontally when the door is open, but is forced down out of sight by the door in closing during the last half-inch of its travel. The front gateman, on receiving the signal from the one in the rear and noticing all the semaphores pushed down, signals the motorman to start. By this means and with the aid of the ordinary platform staff it is expected that the length of stops at busy stations will be materially reduced.

In addition to the four trailers just received two of the older motor cars on the Piccadilly line have been converted to this arrangement, so that one train is in service with identical door control on each car. The railway regards this train in the nature of an experiment, and, as a result, certain modifications may be found desirable in the remaining new cars to be delivered.

Each of these cars seats forty-four passengers instead of fifty-four in the ones of older type. These forty cars will mean an addition of 26 per cent to the existing cars of the Piccadilly line and will provide 21,000 additional seats during the rush hours. They are built in the shops of Cammell, Laird & Company, in Nottingham, and cost about £120,000.

Interest in Trackless Trolleys Growing

THERE seems to be an indication of the revival of interest in the rail-less traction system, according to C. J. Jewell, Yorkshire Electric Tramways, Wakefield, England, in view of the heavy expenditure necessary in laying down the track structure for a street railway. Estimates for a street railway track are now in the neighborhood of £25,000 per mile of single track. Where the traffic is dense enough to warrant this expenditure, tramways are already being operated, but it is necessary to find some alternative method of furnishing other less densely populated routes with transportation service at a cost which will permit the giving of self-supporting and reliable service.

Leeds and Bradford are two pioneer cities which have taken up this question with a view to catering to routes that would not warrant the heavy capital expenditure of permanent way. Their experience with the trackless trolleys shows that notwithstanding the small seating capacity and the poor service, the costs of operation are much lower than the average cost of rail cars on these respective systems. Improvements to overcome these defects are now being made and it is expected that in the near future this method of traction will be considerably extended.

Electrification of Quebec Railroads Urged

The Present Period of High Cost of Coal Has Emphasized the Economic Necessity of a Definite Plan of Water-Power Development and Electrification of the Railroads in Canada

IN AN address recently given before the Rotary Club, Quebec, H. E. Weyman, manager Levis County (Que.) Railway, told why Canada, in the near future, would have to decide upon some comprehensive plan for the development of its water power and for the electrification of its railroads. He went on to say that in Central Canada, and especially in the Province of Quebec, there are no coal deposits, but nature has remedied this by providing enormous water powers. These at present are not being utilized to any great extent, but wasted while huge sums are paid to obtain coal from outside the country. Electrification in other countries, even those which have enormous coal deposits, has advanced to such an extent within the last few years that plenty of data are available on electric operation. Using the operating costs of the Chicago, Milwaukee & St. Paul Railway, Mr. Weyman showed how great an economy could be effected by similar operation of Canadian railroads.

Within the zone of the Province of Quebec 15,000,000,000 ton-miles of haulage is done by steam locomotives per annum. This requires more than 2,250,000 tons of coal per year, costing at present $8 to $10 a ton, the total coal bill therefore being from $14,000,000 to $15,000,000. This coal, purchased outside the province, has to be hauled from the mines on an average of 400 miles, involving about 700,000,000 ton-miles of non-revenue haulage, or 5 per cent of the total ton-miles of haulage per year.

The energy required to operate the railways in the zone mentioned would be about 720,000,000 kw.-hr. annually, or at the probable load factor the power plant capacity would be 100,000 kw. When it is considered that there are several water-power plants in the province of 300,000-kw. capacity, this figure appears comparatively insignificant. The total cost of power for electric operation would be about $7,000,000, as against twice that amount now spent for coal. Besides this electrification would save $1,000,000 annually, resulting from the elimination of non-revenue haulage.

All new railroads, said Mr. Weyman, to be constructed in the future should not only for their own but also for their country's sake be operated by electricity. Future development of white coal also demands that all electric power be standardized so as to permit power plants to be interconnected, thereby permitting a constant and reliable supply and giving the whole structure a solid financial footing. Thus the financing, development, rate of return and individual initiative would be assured no matter what abnormal conditions may come. Every one realizes that the past war resulted in injuring the credit of all public utilities and railroads. The whole question is huge, but certainly such a scheme as outlined will have to be undertaken.

American Engineering Council, the executive organ of the Federated American Engineering Societies, is making a study into the causes of labor unrest and industrial defects in the country as part of its effort to eliminate waste in industry. Herbert Hoover is president of this organization.

Old-Time Interest at C. E. R. A. Meeting

The Association Took Stock of Itself and Formulated Plans for Increased Activities, Which Are Calling for an Executive Manager and Separate Meetings for Engineers—Optimism Was the Keynote During the Entire Two-Day Meeting—Much Interest Was Shown in the Topics Discussed, Which Included Preservation of Line Poles, Service and Salesmanship and the Promotion of Traffic

IN AN annual meeting at Toledo Feb. 24 and 25, notable for the interest manifested, the high caliber of papers and constructive thinking and planning, the Central Electric Railway Association got back into its old pre-war stride. Right from the start, in President Robert I. Todd's address, a note of optimism and action was sounded, and this prevailed with constant strengthening to the end of the two-day meeting. Separate meetings for the engineers and an executive manager for the association are among the things which the executive committee will act upon by vote of the convention within the next sixty or ninety days.

Another important step taken was the vote of the meeting directing the appointment of a committee on merchandising transportation to devise ways and means of educating platform employees as the best medium through which to reach the public. The planning of a boat trip should also be mentioned, as it will renew interest in the summer meeting of the association.

ADDRESS BY MR. TODD

President Todd opened the meeting on Thursday morning with about 125 in attendance. In his address he spoke of the opportunity now, with the restoration of peace, for the association to take up its former activities. He pointed out that the 1920 membership included fifty-six railway lines, representing 4,711 miles of line, and, in addition, two steamboat lines. He reviewed briefly the activities of the association during the past year and suggested that the decision to have but two meetings annually instead of three, as heretofore, would seem to be a step in the right direction for the association to take. Continuing his address, Mr. Todd said:

The most important problem before the street and interurban railways at the present time is the restoration of their financial credit with the bankers and the investing public. Emerging as they now are from a period of depression and financial starvation due to a lack of co-operation and appreciation of their true situation on the part of the public, and, in many cases, a ruinous indifference on the part of federal, state and city authorities, the financial condition of many of those companies is very precarious. Yet without the financial oxygen, which was so freely administered by the Federal Government to the steam railroads and numerous manufacturing industries during the late world war, the electric railways of the country have heroically struggled for several years past for their very existence, all the time faithfully serving the public while their stockholders have suffered heavy, and in some cases, irreparable losses.

If our electric railways have thus shown such staying powers in the midst of what seemed insurmountable obstacles, is it not positive proof that with adequate fares and just regulation they will be able to render such service in the carrying of passengers and freight as will contribute perhaps more than any other one factor to the great upbuilding of our American cities and towns and play a most important part during the present and coming period of reconstruction?

This fact is recognized by some of the greatest financiers of the country, who have freely expressed the opinion that with proper rates of fare, electric railway securities will be among the most stable and solid investments anywhere to be found and compare favorably with municipal bonds and other first-class securities. If this be true, as it undoubtedly is, a great civic and moral responsibility rests upon rate-making bodies everywhere to see that such fares are allowed in the interest and welfare of the great body of the public and the growth and upbuilding of the cities and towns.

The fare question is one which is now engrossing the most careful attention of the heads of all electric railway companies. If those which are still solvent are not to follow the financial disaster which has befallen hundreds of others, rates must be allowed which will provide a fair return on the investment and afford means for efficient operation and necessary extensions. This must be done whatever the rate plan may be. City and state authorities sometimes fail to recognize this very evident fact, and very recently in Louisville, Ky., the federal court was appealed to on the ground that to require a company to furnish transportation facilities at a loss was confiscation of property. The court recognized the merits of this appeal and promptly permitted the company to charge a rate of 7 cents.

FEDERAL DECISIONS ON RATES

Recent federal decisions which make steam railroad passenger and freight rates in the states of Ohio, Indiana and Illinois conform with interstate commerce rates, namely, 3.6 cents per passenger-mile and approximately 40 per cent advance on freight rates, are bound to have a favorable effect upon interurban passenger and freight business either by diversion to the interurbans of many intrastate passengers or by giving basis for an increase in interurban freight rates and fares, or both.

In the readjustment of prices of commodities, in order to get back to normal conditions, it is clearly evident that labor must bear its fair share in the general reduction. An equal distribution of financial burdens is imperative if we are to reach a sound, economic basis.

THROUGH PASSENGER AND FREIGHT TRAVEL

A matter calling for our serious consideration is the development and encouragement of through travel over long distances without change of cars. Experience has shown that with proper facilities and publicity such service can be made very popular and profitable. Where such service has once been established, and for one reason or another temporarily discontinued, it has taken great effort to reestablish it. We believe that through, fast interurban trains are in demand, particularly between points where steam railroad trains are infrequent and unsatisfactory. Excellent through interurban service is now being furnished by some of our member companies. Perhaps the greatest recent development along these lines is that inaugurated by the Interstate Public Service Company of Indiana, which has just added to its equipment a number of handsome and commodious steel passenger cars with trailers which run at frequent intervals between Indianapolis and Louisville.

No less important from a revenue standpoint is the operation of through freight and express cars which will avoid the delay and loss caused by transferring shipments en route.

Local freight service should also be improved. If interurban companies are to recoup their passenger losses on account of automobile travel, they will find it imperative to greatly develop their freight business. This fact I think is recognized by all.

A committee of this association is already considering motor truck competition and will make its report in due time.

While we are now passing through a period of "hard times," the future is full of promise. No line of industry has had to bear more burdens during the last few years than the electric railways of this country, and no industries have shown more grit, loyalty and determination in the face of what seemed almost insurmountable obstacles. This gives hope for the future, so much so, that President Gadsden of the American Electric Railway Association in a recent address assured us that:

"With the revenues of electric railways adjusted so as to cover the cost of operation and provide an adequate return upon investment at all times, the credit of electric railways, provided we have the proper financial structures, will rank next to municipal securities."

SERVICE AND SALESMANSHIP

After a few minutes devoted to the business of the association, James P. Barnes presented a paper on service and salesmanship, which was very enthusiastically received. In the course of the discussion which followed the association voted to have the paper printed and given a wide distribution among the association members and employees. The paper appears in full elsewhere in this issue.

One of the points made by Mr. Barnes which evoked a good deal of discussion was that the employees of a railway company formed the most effective means through which to reach the public. C. L. Henry, president Indianapolis & Cincinnati Traction Company, agreed with Mr. Barnes that this was the best method of developing good relations with the public, but that it was the very hardest plan to carry out. He spoke rather hopelessly of the difficulty of educating the platform men and suggested that Mr. Barnes write another paper telling just how it could be done. Mr. Barnes retaliated, good humoredly, by saying that if he had a definite plan for doing this he could sell it.

S. B. Hutchins, Westinghouse Traction Brake Company, suggested that something could be accomplished by calling in a few of the best platform men and talking with them about the suggestions in Mr. Barnes' paper, with the idea that they could be asked to bring up the matter in employees' meetings and induce their understanding and co-operation.

Prof. D. D. Ewing, Purdue University, said that much could be accomplished, in his opinion, if the association would maintain a bureau of facts which could disseminate information generally to the newspapers and could function as a source of reliable information upon which the public press and civic bodies could call. He said that the greatest need was to overcome the publication of misinformation and that this bureau might serve as an important corrective measure.

M. B. Lambert, Westinghouse Electric & Manufacturing Company, expressed the feeling that where there is a will there is a way to accomplish the co-operation of employees. He contended that the problem is that it is not so much the ignorance of the trainmen and the people generally as it is that they know so much that is not so. He spoke of the American Electric Railway Association work along the line of merchandising transportation and said that the first phase of the work which the committee assigned to that task is to take up is that of training the employees. He then suggested the appointment of a C. E. R. A. committee on merchandising transportation, whose duty it would be to devise ways and means of educating the employees, and then put this in the form of a motion, which was passed by the association.

A. Schwartz, Toledo Railways & Light Company, suggested that a committee be appointed to work up effective posters for use in the cars of the member companies, but this was not acted upon.

Thursday Afternoon Session

A motion picture, "From Tree to Trade," was shown at the opening of the afternoon session in conjunction with a paper by R. R. Cunningham, Long-Bell Lumber Company, Indianapolis, Ind., on the "Conservation and Preservation of Line Poles." In his paper Mr. Cunningham reviewed some of the fundamentals in connection with the preservation of poles by treating with creosote and cited the long life which has been derived as a result. He also explained the process of treating used by the Long-Bell company, which consists of first subjecting the timbers after air-seasoning to a pressure treatment of creosote in a closed tank, followed by the application of a vacuum for withdrawing practically all of the surplus oil from the timber. In answering a question he explained that this method had been found to be more effective and less expensive than the earlier process wherein the timber is first subjected to a vacuum, followed by the pressure treatment.

THE FUTURE OF THE C. E. R. A.

The association then entered upon an extended discussion of the Central Association, which was in the nature of taking stock of the position of the association and what its future course should be. President Todd called upon C. L. Henry to start the discussion. Mr. Henry commented that he had watched the development of the association from its very beginning and expressed the feeling that its career had been about as perfect as human minds could make it. He said its activities had always been marked by harmony and unity of purpose, to which might be attributed much of the success attained. He said it was about the first association to take in the supply men and manufacturers as members and that this act had been a great success. He urged, now that the number of meetings had been reduced to two, that they should each be made unusually strong. He thought the summer meeting should be attended by as much pleasure and fun as possible, and that the winter meeting should include a banquet at which the biggest men in the industry should be secured to speak. He also recommended that there should be a meeting of the executive committee in between these two regular association meetings.

He spoke of the strength and accomplishments of the subsidiary traffic association and suggested a wider work. He expressed the opinion that the railways embraced by the association are on the eve of a splendid development in the freight, express and passenger transportation business. He said it was remarkable how much preference people show for interurban travel, and mentioned the action of the Indiana farmers in securing the passage of a state law permitting the hauling of live stock through the streets of any city in the state in interurban cars. He declared that the harvest is now ripe and that the electric lines can secure a splendid increase in all classes of business if they go after it. He also urged that there should be further standardization.

Turning his remarks to present conditions, Mr. Henry vigorously admonished the manufacturers to bring down the prices of equipment. He contended that there cannot be any success in the electric railway business until the manufacturers take this course. He cited an instance where a manufacturer had written urging that the railway give an estimate of its requirements for the following year of a certain material, in order that the manufacturer might be in a position to meet them and stating that the price was so much and there was no prospect of any lower price. As the material had been satisfactory and the company desired not to make any change, the company promptly placed an order. The next day a letter was received from the manufacturer quoting a price of 10 cents a pound less than that at which the order was placed and saying there was a supply on hand for immediate delivery.

Mr. Henry spoke of the great reductions in the prices of raw materials and contended that these reductions had not been passed along to the consumer purchasing manufactured articles. His remarks were general in character and applied to manufacturers in general lines of merchandise as well as to those supplying the electric railway field, his criticism being that all along the line they were not willing to bring prices down. But he warned that they would have to for the people had stopped buying, citing as an indication of this fact that on his property alone, the tonnage shipments of freight had been 34 per cent less in last November than in the corresponding month the year before, 38 per cent less in December and 40 per cent less in January. He insisted that the manufacturers have got to come down, that the people will not purchase freely until prices are properly adjusted.

M. B. Lambert explained that Mr. Henry's wail is virtually the one which the manufacturers are making to those who supply the raw materials, and to the railroads because of the extremely high freight rates and passenger rates, and to the hotels and all along the line. He referred to the determined effort which the manufacturers are making to bring about lower prices and said that his company, the Westinghouse Electric & Manufacturing Company, was following the lead of its bigger contemporary with a 15 per cent reduction in wages. He thought Mr. Henry's criticism was too broad in character and said that it would be impossible for the manufacturers to make wholesale reductions, but that they were hoping that broad economic conditions would bring prices down and that they were doing everything possible to hasten this time.

C. E. Sawtelle, Tool Steel Gear & Pinion Company, endeavored to show that the labor cost is the determining factor in the prices of material and equipment and explained that the living costs of employees have decreased but very little and that it was not fair to make material reductions in wages, and that until this were possible it would be impossible to make marked reductions in the prices of gears.

L. G. Parker, Cleveland Frog & Crossing Company, said the manufacturers in the steel industry are using the best minds in an effort to bring about price reductions. He quoted a prominent steel man as saying that perhaps the best way to reduce prices was for them to sell below cost, for, judging from past experience, they would then find a way to produce below that price. Mr. Parker also pointed out that it is the consensus of opinion in the business world that, first, prices will never return to the pre-war basis, and, second, that the new normal price will be from 40 to 50 per cent above the pre-war basis, on account of the increase in taxes, the new level of wages, the higher railroad rates, etc. He pointed out that the price of steel is coming down, and that as this affects nearly everything else there will probably be seen in the next six months a gradual reduction in the prices of manufactured articles in general.

Getting back to the discussion of the future of the association, Harry Reid, president Interstate Public Service Company, proposed the employment of an executive manager for the association whose primary job it would be to execute the work of the association. He indicated that this matter would be taken under consideration by the executive committee at its next meeting.

S. W. Greenland spoke of the reorganization of the National Electric Light Association and the engagement of an executive manager and said that while this had resulted in an increase in dues of 100 per cent, he had paid the present dues more cheerfully because he was getting more out of the association. He thought that such a man in charge of the Central Association work would be able to get a great deal more out of the committee activities than is accomplished at present, and he should also be a person competent to supervise the work of committees.

George H. Kelsay, superintendent power and shops, Cleveland Southwestern & Columbus Railway, made a plea that the engineers be given some form of organization whereby there could be a greater and freer exchange of ideas and experience. He commented that it would seem that the work of the engineers was just as important as that of the traffic men and accountants, who now have separate subsidiary associations. He referred to the success of the meetings of the Association of Electric Railway Men, which comprises the mechanical men of Ohio and Pennsylvania.

H. A. Nicholl, general manager Union Traction Company of Indiana, thought that the association had taken a step in the wrong direction when the number of meetings was changed from three to two and that, if anything, a change in the other direction would have been desirable. He also commented that the meetings were characterized by too much discussion by executives and recommended that programs be arranged for the men who actually are in charge of the operation of the properties. He thought that such programs would be conducive to better results from the association meetings. He suggested that an opportunity be given men who are reticent about speaking to prepare their discussion of papers in advance. He also urged that men should not accept appointment on committees unless they intended to do their share of the committee work, not expecting the chairman to do it all.

An engineer for one of the traction companies expressed the view that under the present arrangement the engineers have practically no voice and they feel that it is not worth while for them to attend the meetings. He said that the upkeep of the cars is exceedingly important, for they are the stock in trade of a transportation company and he felt that the equipment men had not been getting proper encouragement in their work from the higher officials.

Professor Ewing also indorsed the idea of a subsidiary association for the engineers and operating men, for it seemed to him that the men responsible for the actual operation of the properties were not having a voice in the developments made through the association. He thought it was desirable to have some form of meeting where it would not be necessary to write a paper or to make a speech in a formal meeting, particularly in the presence of the boss.

In order that this matter, which had already been proposed at several previous meetings, should receive definite consideration, Mr. Kelsay made a motion, at the suggestion of M. B. Lambert, that a committee be appointed to report to the executive committee a proposed plan for meetings of the engineers. This motion was passed. While it was before the association, Mr. Hutchins remarked that now that all of the "commendations and indictments" had been expressed, he wanted to urge the adoption of some plan which would bring the engineers back into the meetings. He felt that in the past the work of the standardization committee had not been properly encouraged and that it had fallen down for lack of support.

Mr. Henry moved that the president be requested to call a meeting of the executive committee in the interim between this and the next meeting to consider the various matters which had been suggested, and the association so voted.

Friday Morning Session

In the absence of Mr. Todd, A. C. Blinn, first vice-president, presided at the morning session on Friday. A paper on traffic building was read by Bert Weedon and followed by prepared discussions by L. M. Brown, F. D. Norviel and J. H. Crall. These papers will be published, in abstract, next week.

C. O. Sullivan, traffic manager Western Ohio Railway, Lima, Ohio, emphasized the importance of co-operation between the transportation and traffic departments. He said that the traffic men must know about the limitations and capacity of the transportation department when they go out to get business so that they will not contract for business which will result in a loss to the company, or make promises which the transportation department cannot perform. He also thought that the traffic men ought to be in a position through their contact with the public to make valuable suggestions to the transportation department as to schedules and service.

C. L. Van Aucken, editor *Electric Traction*, prepared a discussion which was read by Mr. Henry, in which he emphasized points made by Mr. Weedon that the traffic man must know his competition and that his success depends on the service he has to sell. He said that the transportation department should turn heaven and earth, if necessary, to carry out the promises of the traffic department. He suggested that perhaps better co-operation between departments could be secured by having the men work a certain length of time in the other departments and by having frequent conferences. He told the traffic men to keep out of their swivel chairs except after 6 p.m.

In response to a question, Mr. Weedon said that more money could be made in handling carload shipments than l.c.l. merchandise. A careful study of the cost of handling l.c.l. shipments on the Interstate lines had shown that the best that could be done was to break even on this class of business, when a reasonable return on the equipment and property used was included. He spoke of the recent installation of overnight freight service between any points on the line between Indianapolis and Louisville and said that this resulted in an increase in the first thirty days of something between 30 and 40 per cent. As to how more business could be secured, he said that it was purely a matter of service, and that whatever success is attending the efforts of the Interstate Public Service Commission is entirely a result of trying to give the communities what they want.

Mr. Greenland spoke of the need not only to get revenue but to conserve it after it is earned. He said that during the war, when business was very heavy, there had been many claims for damages and lost freight. The number of such claims had been greatly reduced and a much better feeling toward the company created by arrangement for handling such claims promptly. A special man was assigned to the task of investigating each claim and settling at the first possible moment. He said that in some cases the company had actually paid for damages before investigating a claim, where it was reasonably sure that the claim was correct. Mr. Greenland commented that if a settlement can be made before a claim is entered it results in the development of an excellent feeling. He felt that this prompt settlement plan was one of the best things his company has done.

EXCESS CHARGE ON FARES

Commenting on the proposal in the paper by J. H. Crall to collect an excess charge where cash fares are paid on the cars, Mr. Blinn said that 10 cents additional was being charged for cash fares on the limited trains of the Northern Ohio Traction & Light Company, but he was surprised to hear that the Ohio Electric Railway was refunding this additional charge, and he wondered upon what theory this was being done.

Mr. Sullivan explained that the Western Ohio Railway has been charging an excess of 10 cents for more than two years and refunding the charge where application is made for it, to comply with the order of the utilities commission. Before the 10-cent excess charge was inaugurated, the cash receipts of the company were 60 per cent of the total receipts, but within three months after the excess charge was inaugurated this was cut down to 20 per cent. In other words, the plan was effective even though the excess was refunded. The reason the commission ordered the refunding of the excess was that if it were not refunded it would be equivalent to a rate of fare in excess of 3 cents per mile, which was the limit set by law.

J. F. Starkey, Lake Shore Electric Railway, said that his company was charging an excess for payment of cash fares. The present tariff provides for a ticket fare of 2.7 cents per mile one way, or 2.5 cents per mile for round trip, and 3 cents per mile for a cash fare paid on the car. He raised the question of whether it would not be advisable to petition for a cash fare rate of 3.6 cents per mile, or equal to the steam road rates, and retain a ticket rate of 3 cents per mile. In reply Mr. Blinn commented that he was afraid that a general increase to 3.6 cents per mile on the interurban lines would result in diminishing earnings. Mr. Sullivan said that some of the Ohio lines were now taking up this question informally to see whether they cannot file a cash fare tariff of 3.6 cents per mile, leaving the present 3-cent rate in force for ticket fares.

Another member said that in Michigan the legal rate of fare is 2½ cents a mile, and as the interurban companies are charging this limit at the present time, it is impossible for them to impose a 10-cent excess charge for cash fares. He also spoke of soliciting freight business by going through a manufacturer's plant and seeing what he makes and then trying to get him to do business either with a consumer of his product or a producer of his raw materials located on the interurban line.

MOTOR TRUCK COMPETITION

P. H. Conroy, Tool Steel Gear & Pinion Company, brought up the subject of motor truck competition and said that the manufacturers should co-operate with the electric lines in educating the public to the true situation in this connection. He pointed out that it costs 300 per cent more to build highways today than it cost thirty years ago to build railroads. He said also that the maintenance of these highways is two or three times as great where they are subjected to heavy trucking as it is where they are used only for pleasure vehicles, and the people should know this. Referring to Mr. Weedon's comment on the absence of profit in handling l.c.l. shipments, he said that the cost could be reduced by greater volume of business, because the same crew can handle more cars with the same labor cost. One way to get a greater volume of business is to arrange for more interchange between companies.

Mr. Greenland said it might be well for the companies generally to take up the slogan adopted by one company of "Ship by Trolley and Save the Highways." C. J. Munton, president Fort Wayne & Northwestern Railway and receiver of the Winona Interurban Railway pointed out that perhaps the association members should go slow in condemning automotive vehicles and the use of the highways for shipping, for they may want to do this themselves later on. He said that his company was considering the advisability of connecting up all the small towns within a radius of 15 or 20 miles with motor bus and motor truck lines, acting as feeders to the electric line. He said that these motor bus lines may show no profit in themselves, but will contribute to the gross business of the electric line, which can be done profitably. He said that one line will probably be established in the near future to try it out, a line which will operate over a state concrete highway and serve a community which now has no way of making direct shipments to and from Fort Wayne. It now takes one week to get a freight shipment from Fort Wayne to this point, only 30 miles away.

T. A. Ferneding, general manager Dayton, Springfield and Xenia Southern Railway, said that the motor truck people should not be permitted to operate in competition with the electric lines without being forced to pay a proper tax for the use of the road. He contended that this was unfair competition, for the electric lines contribute very heavily through taxes to the cost of road construction, from which the motor truck companies under present conditions derive full use with almost no charge. If the motor truck company must pay its share it cannot exist on a fair competitive basis.

Mr. Starkey commented that a number of truck companies in competition with his company had started in business, but that most of them had failed and ceased to operate. He also spoke of an ordinance passed in Sandusky which placed the jitneys under control and caused them to disappear. In this case the ordinance was drafted at the invitation of the city. He also expressed a skeptical opinion on the advisability of increasing electric rates to the steam road level. He believes the interurbans are doing more business now because of the high steam road rates.

Mr. Barnes expressed the view that the companies should find out what the people want and give it to them. He thought that it would be impossible to make any one pay for the use of the public road, for the freedom of this is an age-old custom which cannot be changed in a few years. He referred to the paper presented at Atlantic City last fall by George M. Graham, vice-president Pierce-Arrow Motor Car Company, in which the industry was asked whether it would have the automobile as an ally or competitor. Mr. Barnes said that every means of transportation is our means of doing business, but in this case it was a question of whether we would have co-operation or competition. He thought the former was much better, and said that it was freely offered by this prominent manufacturer, who probably voiced the feeling of the automotive industry, and that it was up to us to make a choice, but that we must do it soon or the opportunity would pass.

ELECTION OF OFFICERS

In his annual report Secretary-Treasurer L. E. Earlywine pointed out that the financial status of the association is the best since its organization. C. L. Henry, chairman of the nominating committee, then made the following report on officers for the ensuing year, which was confirmed by the association:

President, A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company, Akron, Ohio; first vice-president, S. W. Greenland, general manager Indiana Service Corporation, Fort Wayne, Ind.; second vice-president, G. T. Seely, vice-president and general manager Pennsylvania-Ohio Electric Company, Youngstown, Ohio.

For members of the executive committee the following were named: F. D. Carpenter, R. I. Todd, C. L. Henry, H. A. Nicholl, C. N. Wilcoxon, W. S. Rodger, F. W. Coen, J. F. Collins, Harry Reid, H. C. DeCamp, W. D. Hamer and A. R. Baxter.

In accepting this office Mr. Blinn made a few remarks which are reported in the personal columns of this issue. He then brought up the subject of the summer meeting and said that there was such a general feeling that the association should again have a boat trip that he would like to have the matter discussed at this time. He then appointed the following committee on arrangements: S. D. Hutchins, Westinghouse Traction Brake Company, Columbus, Ohio, chairman; Harry L. Brown, ELECTRIC RAILWAY JOURNAL; John Benham, International Register Company; L. E. Gould, Economy Electric Devices Company, and C. Dorticos, General Electric Company.

Mr. Henry expressed himself as being strongly in favor of the boat trip, saying that the association had never hit upon anything which was so completely satisfactory from both a pleasure and business standpoint as the boat trips which had been taken in previous years. After other enthusiastic discussion a motion was made directing the committee to determine at the earliest possible moment whether the boat trip could be had without prohibitive cost, and if so that the boat trip be adopted as the plan for the summer meeting. This was unanimously adopted on a rising vote.

Railway Electrification in Japan

THE Department of Railways of Japan, satisfied that railway electrification has been already tested out in that country sufficiently to assure success, proposed a bill last July in the Diet for the completion of the extensive power system along the Shinano River. According to a statement in the *Trans-Pacific* this bill, calling for an expenditure of 100,000,000 yen, failed by a narrow margin, although railway officials foresee the consummation of their plans in the near future by presenting it in a different form. The development of this project will permit the electrification of about 400 additional miles of Japan's state railways. The scheme for widening the gage and the alternative for double-tracking were both dropped early this year.

Sincerity, Service and Salesmanship*

A "Sermon" on Relations with the Public — The Best Way to Reach the Public Is Suggested by the Expression "One of the Conductors Told Me, and He Ought to Know"

By JAMES P. BARNES
President Louisville (Ky.) Railway

AT THE midyear dinner of the American Electric Railway Association former Chairman Wilkerson of the Illinois Public Utilities Commission talked, straight from the shoulder, the kind of talk that railway operators need today to hear and ponder. His address followed a day devoted to the presentation of papers dealing with all phases of electric railway finance. President Gadsden in closing the business session of the meeting spoke most earnestly of the loss to the industry which resulted from the failure of association members to discuss fully and vigorously the subject matter of papers and resolutions placed before them for consideration. His remarks were especially apropos, for the association had just adopted by viva voce vote and without discussion what is probably the most important and far-reaching resolution that has ever come before any of its meetings. The report of a special committee on the findings of the Federal Electric Railways Commission and the public utilities committee of the United States Chamber of Commerce had just been adopted, and by it the association bound itself to, first, a recognition of the fairness and soundness of the analyses in these reports; second, a recommendation to electric railways to accept these reports as a working basis, and, third, a policy of the most complete service at the lowest possible profitable fare.

Here are three planks which, taken with the code of principles adopted by the association in 1914, form a platform of complete frankness and uprightness in dealing with the public. And now arises the pertinent question: "What shall we do about it all?"

Many of the men in this room were in attendance at Atlantic City when that code of principles was adopted and all of us remember the publicity it obtained. The code was adopted without dissent and bound the association, among other things, to a policy of "full and frank publicity—to the end that proper information may be available to the investor and the public." Again the pertinent question: "What shall we do about it all?"

That was more than six years ago. What did we do about it? Was there a general adoption of the policy of "full and frank publicity" regarding company affairs? Was all proper information made available to the investor and the public? Will we now wholeheartedly adopt the policy laid down in our resolution of latest adoption and sincerely meet the public representatives on the program laid down in the two reports of the federal commission and the United States Chamber of Commerce?

If we do not do these things then the time has come for us to hand in our resignations and let our better qualified successors be chosen, for only on the basis of fair-minded, clean-handed open dealing can the traction problems of this country be solved in the future.

Mr. Wilkerson in the address referred to summed up our situation in the language of a man familiar with that of which he spoke and toward the close of his address made this significant statement:

> You must organize and you must fight. I know that some good work has been done, but I know that you will pardon me when I say that my observation has been that it has not been carried on with the zeal that the righteousness of the cause requires . . . There is need for straightforward and emphatic expression. . . . You must reach the people. . . . Make no mistake. The courts cannot save you. . . . If you get the people back of you, if you can convince them that you have been right and are right . . . they will take care of the politicians and the dishonest newspapers.

Here, summed up in the words of a thoughtful, experienced utility commissioner, is the golden rule for the conduct of a great public service. Built on the foundation of right, honesty, fair dealing, and good service, the structure of our utilities shall stand and serve as long as society requires transportation.

HOW SHALL THE PUBLIC BE REACHED

Now it is one matter to say "convince the public that you are right" and quite another to do that thing. But it is not impossible. Here applies with double force Mr. Wilkerson's criticism of our lack of zeal. Often have we overlooked the obvious and neglected the available means of carrying our problems home to the people we serve.

Chairman Jackson of the board of trustees now operating the Boston Elevated Railroad recently remarked that in his two years on that board he had received and reviewed many service complaints of all shades of intolerance and criticism. "But," said he, "I do not remember ever to have seen a complaint from a motorman or conductor of the treatment he had received from a passenger." The universal application of this expression of the one-sided practice of patience involved in everyday service will be recognized by every railway operator. Truly, compared to many of the uniformed men whose daily life consists largely of "fares, please," "transfer?" and "please step forward," Job was an amateur.

Many a superintendent and instructor has concluded his remarks to the new employee with "and remember when you get out on your car and go up against the public you've got to be prepared to co-operate for two." And generally the instructions are well received and thoroughly executed by the "boys in blue," who, after all is said, compose the forces which wield for better or for worse that powerful two-edged sword of public opinion.

We are prone to forget these first-line troops of ours, however. We forget that they are in action day after day and the impression made by that parting injunction of the "super" will not forever outwear the friction of continuous contact with the riding public. Most men mean to be cheerful in the course of their daily concerns, but on the back platform especially one's inclination in this direction frequently suffers purely from lack of example. Example is better than precept, and the need of an example of cheery compliance with the law of service for the greatest convenience of the greatest number must be met—if not by the public then by the public servant.

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*Address presented at the annual meeting of the Central Electric Railway Association, Toledo, Feb. 24, 1921.

We are all prone to forget how many passengers form their opinion of a company solely from the treatment they are daily accorded by its employees as they travel to and from their places of business. Public opinion—much considered and discussed but too elusive and intangible for definition—is nevertheless the foundation of successful traction, and properly to understand and analyze its qualities we must know what it says and whence it springs. Its criticisms must be met fairly and openly and, when just, satisfied. The example of cheerful and respectful hearing, consideration and action must come from the officers and be carried down through subordinates to the men actually in close daily touch with the public, whence spring these criticisms.

More fully than has been generally recognized the public opinion of this industry is the opinion of the people who ride. Too often our ears are open and our attention alert to catch the comment of the so-called "influential citizen," and too seldom to heed the complaint of that great body whence come the 5, 6 or 7-cent increments of our life's blood.

Too often are our explanations and appeals directed to the ears of the few and not to the many who are the riders and supporters of our business. Too often are we in the position of the large retailer whose trade is cosmopolitan but whose advertising is carried in the medium of exclusive circulation. We tell our troubles to the banker, the financier, the manufacturer, and forget that time-worn expression, "Tell it to a policeman, everybody's friend."

Our message is, and must be if it is to be successful, for the ears of everybody. When everybody has full information and all reasonable explanation of mooted points Utopia will not, perhaps, be realized, but at least, we shall be better off than now. Not until we get this habit in thought and in deed of "telling it to everybody" will we get our message completely across, and even then we may have all the trouble, and more, that Peter Grimm had with his comparatively simple story.

We serve the people more frequently and more personally, perhaps, than any other utility, and we must understand and be understood if the great intangibles, "public convenience and necessity," are to be allies instead of enemies.

We err if we do not grasp every opportunity and utilize every agency to bring about the complete understanding of and sympathy with our problems which must be the foundation of that magnificent superstructure—co-operation—which is the design and aim of us all. We have suffered much and learned much in the trying times of the last few years. Bitter lessons and costly have been ours, and to the credit of the industry be it said that they have been learned with a maximum of fortitude and a minimum of complaint.

The sun of optimism which peeped through the clouds of adversity at Atlantic City last October for the first time in many weary months has been encouraged more than by any other thing by the work of our association and individuals in bringing about public understanding of our situation. We have learned to use the association, the committee reports, the newspapers and many other agencies of publicity, but have we not neglected the most useful and the most available agency, perhaps because it lay at our very door?

MAKE THE MOST OF THE TRAINMEN'S PUBLIC CONTACT

We enjoy in marked degree the privilege most eagerly sought by all progressive sales organizations—that of frequent (in our case almost continuous) contact between our sales force and our customers. Twice a day do most of our customers transact business over our fare-box counters, and each time an opportunity is presented for the making or unmaking of favorable opinion of our business methods.

Every street car conductor is a salesman for his company, and upon his handling of his passengers depends the quality of public opinion for the particular group that he meets. More frequently than we realize the platforms of our street cars become the public forums for discussion of the good and ill of street-car service, and many an opportunity is opened for the well-informed man to correct popular misunderstandings, and interject the "soft answer which turneth away wrath." A phrase or sentence here or there is passed on until it reaches the dignity of the oracle backed by the authority of "one of the conductors told me, and he ought to know." There's the rub—He *ought* to know—but do we always give him the opportunity to find out? A well-informed conductor becomes a boosting publicity agent if his information consists of sound ideals of service; and if it doesn't we had better change the ideals, and do it quickly!

To mention only one of many matters prominent in the platform discussion may illustrate: Rates of fare and transfer rules are based upon reasonable considerations, else commissions would not permit their continuance. How often is the street-car platform discussion of the questions enlightened by true explanation, based on facts? Not often enough. Then whose fault is it? What would we say in criticism of the sales manager who sent his salesmen out to sell without first making sure that the nature and prices of their goods were understood by them? What would we say of the sales manager who assigned to his men no reasons for the rules and regulations under which they must sell their wares? Is it sufficient reason that the orders read thus and so, that there need be no reason for the orders? And if the reason is a good one, does not the telling of it strengthen the order? Publicity never weakened a righteous cause or lost a just fight. The reason why can still the fretful "why not."

Those from whom we would have frankness in dealing are entitled to frankness in return, and if rules, rates or regulations are attacked then, in all fairness, we should furnish ammunition for defence or revise the offending text.

A famous hotel-keeper has built a fortune around the text "The guest is always right." Present-day methods in mail-order houses, department stores and other concerns dealing directly with large numbers of individuals have prospered by similar means. How much good will has been added to the nation's daily life by the inclusion of the word "please" in the invariable telephone greeting from central? How much more might be added if the nation's street-car business were put on a corresponding plane of "the voice with the smile"?

Truly, our sales problem has become that of selling ourselves to our employees. If we truly stand on the platform of the best service to all comers we will turn our attention and our best efforts to the problems of selling this ideal to ourselves from top to bottom of the organization. Let every street car be a mart where service is measured by the Golden Rule, and there will be service and satisfaction run together to the goal of public content and a new dawn will break over the industry.

In another sense have we a sales problem. That of selling our proposition to ourselves! Deliberately I say that we do not know all that we should of our own properties and problems and those of our neighbors. No railway man with open mind can take his pair of eyes and pair of ears to such a meeting as this without bringing back ideas gleaned from his fellows, which will improve his own operation. That man who has reached a point where he feels his operation is not susceptible to improvement has indeed started backward and we may eliminate him from our discussion as the industry will eliminate him from its ranks.

It would be strange indeed for a newcomer in the ranks of this association, known throughout the country as an active, effective, working unit, and a monument to its builders, to come forward with suggestions or criticisms regarding its plans and methods. Criticism is far from my purpose, and suggestion in concrete form is beyond my capability. This is the first C. E. R. A. meeting I have been privileged to attend. My reference to association activities must then be in general terms and in form of inquiry.

Are we, in this association, doing all we can to serve as a clearing house for information so that our membership may be kept advised by correspondence, by discussion, and by personal interviews of the kaleidoscopic changes of daily occurence in our territory and throughout the country? Are we giving to our subordinate officials all the opportunities that could usefully be given for interchange of ideas and mutual improvement? Are we furnishing the means for the experience of each of us to be made quickly, fully and intelligently available for the good of all? Are we providing means for the application to any particular problem, local or general, of the averaged and balanced results of the experience of all of us?

If these things are not now being accomplished then our discussion of the future of the association should surely take the form of a discussion of ways and means to bring these things about that each may assist all, all assist each and the whole plan of our activities run to the one ultimate object—Best Service to the Public.

Superpower Plans Outlined

Secretary Payne Explains in Progress Report the Present Requirements, the Expected Savings and a Possible Financial Plan—Complete Report Expected to Be Finished by June 30

ON FEB. 24 Hon. John B. Payne, Secretary of the Interior, submitted to President Wilson a progress report on the superpower survey being conducted by W. S. Murray and staff as part of the work of the Geological Survey. The complete report, it is expected, will be finished by June 30, 1921.

According to the preliminary report the survey has found that there are in the area under consideration 14,500 miles of track of Class A steam railroads, 36,000 miles of total trackage and 10,000 steam locomotives and that there was a total coal consumption for railroad purposes during 1919 of 19,000,000 tons. About 33 per cent of this trackage can be economically electrified and this mileage will carry from 50 to 60 per cent of the traffic. This electrification will mean an annual saving of 6,000,000 tons, or $40,000,000, besides an annual saving of $50,000,000 in engine repairs and maintenance. The total cost of this electrification would be $40,000 per mile of main track, which for 12,000 miles would be $500,000,000, and $300,000,000 for tracks and siding electrification. There would be a salvage of $150,000,000, and the return on the $650,000,000 required would be approximately 14 per cent on the investment.

It is expected that the superpower system in 1919 would have saved the industries in the area mentioned between six and eight million tons of coal and that by electrification the anthracite mines would have saved 6,500,000 tons in addition. The utilities in the section covered by the survey use 8,000,000,000 kw.-hr. of energy generated from coal at an average coal consumption of 2¾ lb. per kilowatt-hour. The expected reduction to 1¾ lb. by the superpower plan would effect an annual saving here of 4,000,000 tons annually.

Water power available in the zone could supply 12,000,000,000 kw.-hr. and for a minimum year 8,360,000,000 kw.-hr., the plant capacity required being 2,300,000 kw. It is expected that in 1930 the total requirements will be 48,000,000,000 kw.-hr., of which the superpower system could supply 36,000,000,000 kw.-hr., so that the water power supply in the ultimate system can be but from 20 to 25 per cent of the total.

FINANCIAL PLAN CONTEMPLATED

The financial plan in bare outline provides for a superpower company with a non-par stock as its only class of security. The public utilities within the Boston-Washington zone would be entitled to subscribe for this stock pro rata, based upon capacity demand, and load factor and stock not taken by these customers of the superpower system will be offered to public subscription.

A contract between the superpower company and a local public service company would be a selling contract or a buying contract, while in many cases both buying and selling of current would be involved. These contracts, on which the state regulatory bodies would pass, would be adjusted from time to time to meet the progress of the art and changing conditions, whether favorable or unfavorable to costs of operation. Returns upon the stock of the superpower company, according to the plan, should be limited by specific provision to a fair division of the benefits derived from its operation between the investing public and the consumers. This division would be attained by a rule under which the customer companies shall participate equally with the stockholders in any distribution, at stated intervals, of net earnings in excess of a specified rate of return, which itself should be more liberal than is commonly contained in the idea of public regulation. Thus efficiency in management would be rewarded and the public interest directly served. To secure the participation of the ultimate consumer in this division of benefits it is suggested that the superpower stock held by any public service company should be regarded as representing an extension to its existing station capacity rather than an outside investment security.

Electrification an Economic Necessity

Heavy Traction Expert Outlines Broad Principles Which Must Be Considered in the Application of the Electric Motor to the Solution of This Country's Transportation Problems

AT A well-attended meeting of the electrical section of the Franklin Institute, held in Philadelphia on Feb. 24, A. H. Armstrong, chairman electrification committee General Electric Company, Schenectady, N. Y., read a paper on the economic aspects of heavy electric traction. W. C. L. Eglin, chairman of the section, presided. Mr. Eglin is electrical engineer of the Philadelphia Electric Company, which supplies the power for the Philadelphia-Paoli-Chestnut Hill electrification of the Pennsylvania Railroad. During the delivery of the address an interesting series of appropriate lantern slides was shown. These depicted recent snow scenes on the Milwaukee electrification, as well as typical heavy electric traction scenes in this country and abroad.

Mr. Armstrong began by pointing out that it is a matter of grave national concern properly to diagnose the true character of the ailment affecting our transportation system and to prescribe the treatment of greatest promise for its future recovery. The congestion on main lines is in many cases acute, and under such conditions the steam locomotive imposes its limitations on the physical and economic showing of a railway property. We want, he said, cheaper and quicker transportation over existing tracks, more reliable service, less congestion at terminals and proper provision for future growth of traffic.

Continuing, he pointed out the apparent impracticability of making such fundamental changes in railway operation and economics as are necessary to accomplish the desired results simply by investing still greater sums in the old steam engine facilities, which have, in the opinion of many, failed to advance with the needs of the times. Furthermore, during the past twenty years serious competition has entered the field of the steam railway transportation in that electric railways have taken over the short-haul passenger traffic and have created new traffic, while the gas motor truck has captured much of the short-haul express movement at the expense of both the steam and the electric railways. When comparatively small trucks bumping over public highways, not too well maintained at the taxpayers' expense, can successfully compete with rail transportation something evidently has occurred during the past few years which calls for a readjustment of previous ideas of transportation. The question then arises, has the railway operator, in his effort to reduce ever-increasing operating costs, been too busily concerned in running his huge transportation machine fully to observe the industrial needs of the country and to appreciate the evident value placed by the shipper upon speed? Our present railways do not properly serve the more congested districts through which they pass, and our railway directors have themselves to blame if they do not profit from a recognition of the facts underlying the growing menace of motor truck competition.

Coming to the place of the electric motor in the solution of the transportation problem, Mr. Armstrong said that electricity has amply proved its effectiveness in the operation of light high-speed trains in congested zones. Steam traditions of a "busy track" have been shattered by electric train performance. Not only is the electric motor pre-eminently fitted to meet the needs of short-haul, frequent-stop service, but it gives opportunity to relocate and redesign the whole terminal railway property along lines impossible with the steam engine. This is illustrated by the development which has taken place in New York City at the Grand Central terminal of the New York Central Railroad, and at the Pennsylvania terminal in the same city. And in addition to the passenger terminal development, the way has been shown to the solution of the equally vital problem of handling freight and express matters in city terminals. The steam terminal is not immediately adjacent to the shipper or center of distribution in a large city, nor is it well adapted to the expeditious or economic handling of freight. The electric terminal, on the contrary, may be located with proper regard to the needs of the shipper in the very center of the city if necessary.

THE ELECTRIC LOCOMOTIVE HAS SEVERAL INTRINSIC VIRTUES

Taking up the electric locomotive, Mr. Armstrong rated it as the most efficient and flexible known means of transforming potential into mechanical power. Based upon the performance of sixty huge electric locomotives operating over nearly 700 miles of route on the Milwaukee Railroad and on other data of record, it has been estimated that the passenger and revenue freight tonnage of the United States could be hauled by electric locomotives for one-third the coal now burned under steam engine boilers. The electric locomotive also offers great advantages for relieving the congestion on mountain-grade divisions, which has reached such a point that additional rails must be laid to obtain the needed relief with continued steam operation. In comparison with the steam locomotive the electric locomotive can not only develop equal pull but can sustain full tractive power at double the speed. It furnishes the opportunity to enter into an era of real unrestricted railroading with the "motive power lid removed." The development of the more powerful electric locomotive is the determining factor in the matter of grade revision, double tracking and mountain division operation.

Another marked advantage of the electric locomotive which was pointed out is its great reliability and consequent low cost of maintenance. For a period of ten years, or until the "high cost of living" struck the electric locomotive, the 120-ton New York Central electric locomotives were maintained for approximately 3½ cents per mile run, a noteworthy achievement when compared with the upkeep of steam engines of equal power. Even during 1919 the Milwaukee locomotives, weighing nearly 300 tons and making some 60,000 miles a year, were maintained for approximately 15 cents per mile, or less than one-third the upkeep of Mallet engines of equal tractive power. Again, cold weather does not affect the electric locomotive, in striking contrast to the frozen steam engines of the winter of 1917-18, while its greater safety and reliability on grades are matters of record. The possibility of regenerating power also should not be forgotten.

Summing up, Mr. Armstrong said that electrified terminals to large cities should revolutionize present steam engine practice and not only effect economies in operation but greatly stimulate traffic by introducing radical improvements in facilities. With no immediate prospect in sight of any material reduction in the price of labor, its output must be increased, and electric operation has demonstrated its effectiveness in this direction. In addition, locomotive division points may be indefinitely extended. All of these improvements in the electrified railway property will cost large sums of money, although in some items of operating expense, such as fuel, crews and maintenance, direct savings are effected of such magnitude as to show a reasonable return upon new capital charges incurred. The argument for electrification, however, is built upon a broader foundation than a direct return upon the investment. It has to do with the vital question of the future growth of our transportation system and its effect upon our national prosperity.

After the reading of the paper Mr. Armstrong was asked several questions, particularly relating to electrification costs and mileages. He said that the original 440-mile electrification on the Milwaukee cost about $13,000,000. This included forty-two regular and two switching locomotives. This figures out at about $28,000 per route-mile or $18,000 to $19,000 per single-track mile. The regular locomotives cost about $130,000 each and they replaced 112 steam locomotives, worth new about the same in total as the electrics; hence the items of locomotives about offset each other. The last 220-mile electrification on this road cost more, having been carried out in wartime, the increase being roughly of the order of 50 per cent.

Mr. Beeler Studies Traffic in Paterson

Makes Exhaustive Report on Existing Conditions Together with Suggestions for Relieving Vehicular Congestion that Is Stagnating Paterson's Main Thoroughfare—Localized Traffic Centers for Dual Transportation Systems and Through Routing of Trolleys Among the Recommendations

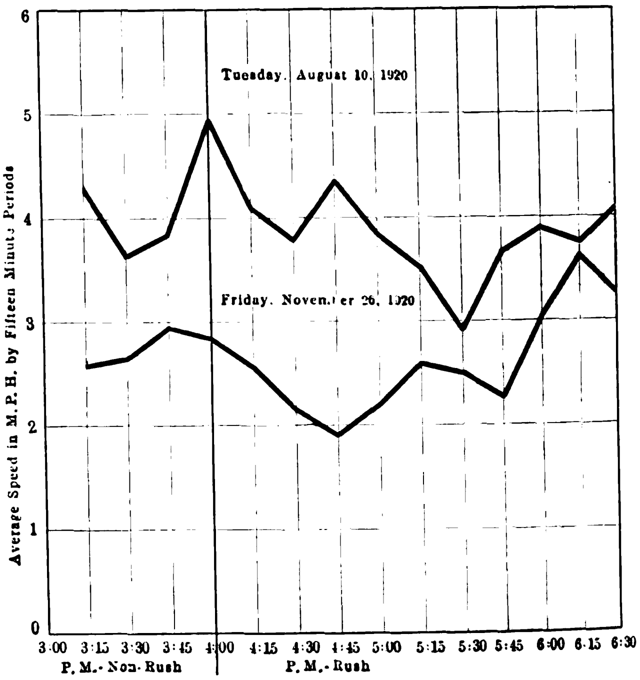
IN A TWO volume report, with maps and tables, John A. Beeler, consulting engineer, New York, analyzes existing traffic and congestion in Paterson's business district and make suggestions for rerouting trolley cars and jitneys that now get in each other's way, with the result that during the evening rush hour all vehicular traffic in the center of the city moves at a rate of less than 3 m.p.h.

Paterson, the third largest city in the State of New Jersey, has a business district of but three main streets to serve a quarter of a million people. All trolley routes focus on the section of Main Street between Market and Broadway, from which most of the cars return to their point of origin via loops, while a few only are through routed. The safety cars that have been installed recently on all the local lines on shorter headway have caused a consequent increase in the number of cars in the central section. In addition, many jitney buses enter the heart of the congested district to deliver passengers and on their outbound trips practically all go through Main Street.

The accompanying diagram indicates car speeds in this central section. The average speed for a three and one-half hour period was but 2.7 m.p.h., while for a single fifteen-minute period it dropped as low as 1.9 m.p.h. This is obviously slower than walking. An abstract of Mr. Beeler's findings follows:

In the business district the designated passenger car stops average fifteen to the mile, whereas eight stops per mile is good practice. The stops in the central districts should be so relocated as to be convenient and safe, yet reduce to a minimum the interference with other vehicular traffic. Thus the number of stops can be brought down from fifty to thirty-seven. Double berthing of cars is recommended at the fourteen busiest stops, raised loading platforms to accommodate two cars each at three points and safety zones marked with stanchions at certain stops.

Repeated observation has revealed that the standard jitney practice attempts to give the same headway as the car line, with the buses leaving a minute or two in advance of the cars. This practice fails to give any real additional transportation service, for it simply provides extra seats that are not needed, as the cars are very seldom filled to capacity even in the rush hours. The only benefit that could accrue to the city from jitney operation would be to have them routed where there is no car service. If the jitneys are unwilling to submit to such a change in routing, it is questionable whether they are of sufficient benefit to the city to justify their retention.



INDICATED CAR SPEEDS IN THE CENTRAL AREA OF PATERSON

All jitney lines now loop in the business district of the city, with the result that they are turning at the most congested points and are not only delaying vehicle traffic but wasting much of their own time. If jitney operation is to be continued, a terminal loop should be used near the center of the city but away from the car lines.

Jitney loading is found to cause some delay and congestion, largely because they almost invariably stop so far from the curb that other vehicular traffic must also stop. Loading should be at definite and plainly marked points where other vehicular parking should be prohibited. The jitneys should be required to pull in to the curb. The present plan of diverting through truck traffic from the center of the city can be extended by keeping all heavy trucking away from the Main Street congested district, except for the necessary purpose of loading or unloading to abutters.

The left-hand turn causes the most delay and confusion at street intersections. Observations at Main and Market Streets from 5 p.m. to 6 p.m. showed 100 left-hand turns out of a total of 410 vehicles at that corner, in addition to 144 street cars. At its widest point, Main Street is barely wide enough to allow a row of parked vehicles, a row of moving vehicles and a row of moving street cars in each direction. At the more important intersections the roadway is even narrower. As a means of lessening congestion indiscriminate parking of motor and horse-drawn vehicles can be limited or prohibited at car and jitney stopping points.

STREET CARS SHOULD HAVE RIGHT OF WAY

It has been demonstrated that the maximum amount of traffic can be moved through an intersection when the street cars are given the right of way. In Paterson, the proposed car stops have been arranged so that many cars are ready to move immediately on the traffic officer's signal. Positive stops required only for safety purposes should not cause delay, as loading is not to be permitted at such points.

The adoption of these recommendations, the report claims, will be followed by an improvement in traffic conditions, for congestion will be reduced even though parking privileges have been retained and a dual transportation system of street cars and jitneys is operated within the confines of such a limited business district.

Unquestionably the modern street car is the most reliable, safest and economical urban transportation unit, provided the volume of business warrants the construction of track and plant. Were it not for the fact that the street railway provides service, whether remunerative or not, to all points at any time of day and cares well for rush-hour traffic, the unregulated jitney would never be tolerated.

STREET CARS AND CONGESTION

The loop routing of the street cars at each end of the important business section, which is only a short city block of 300 ft., is one of the principal causes of congestion. All but two of the car lines, which are through routed, make one of these loops. In general some advantages of the loop system are:

1. That each section of the city is served independently, thus confining delays to that section.
2. Makes for shorter routes.
3. Allows better adjustment of service to fit traffic conditions.

In Paterson there are also some disadvantages, which are classed as:

1. Cars must be sent across the congested district merely for the purpose of taking the loop, thereby causing congestion and resulting in slow operation in the densest traffic.
2. Causes more transferring of passengers, as all crosstown passengers must change cars in the center of the city.
3. Causes duplication of cars and service and creates congestion due to loop cars being used entirely for unloading or loading, while in the business district, whereas compared with through routed service, loading and unloading is done simultaneously when cars pass through the business district.
4. No layover is possible on a common loop used by several routes to keep the cars on proper headway.

The disadvantages outlined for the loop system are almost impossible to overcome, but the advantages can be incorporated in a system of through routing. In Paterson a material gain can be made in reducing congestion by through routing all possible lines.

CHANGES IN ROUTING

Interurban lines should be routed to give the maximum benefit to the communities connected. Such routes cannot be entirely successful if compelled to handle much urban business or traverse the tracks of local urban routes. Experience shows that interurban cars have a tendency to block the locals and delay them.

In Paterson, several lines enter the heart of the city from various outside communities. On none of these is there any distinction made between local and through passengers. In order to provide better service, the interurban cars should be run on express schedule, stopping for passengers only at designated points. These points should be at the principal loading corners and all transfer points, but they should average not less than 1,200 ft. apart.

Observations show that on practically all of the local lines a large number of passengers ride only a short distance from the center of the city. Short line service is recommended to give better service on four routes. A maximum of service to all patrons will result, as more even service can be given to the outer ends of the lines.

IMPROVEMENTS IN OPERATING METHODS

Another factor that contributes in no small measure to the low schedule speed is the slow fare collection, which is caused by excessive change making for a large number of passengers compared with the old nickel rate, when about 90 per cent of the passengers had the exact fare. Some of the advantages of even fares can be obtained by the use of tickets or metal tokens sold in quantity or used by the conductor in making change.

The report also suggests that each car should be conspicuously marked with both route and destination signs and that all stopping places in the congested area should be plainly marked by car stop signs hung from the span wire at the exact point where the front end of each car will stop. Signs with the words "Car Stop"— or at double berth stops "Car 1" and "Car 2"— should appear at the more important loading points and particularly at railroad station stops. Information should also be posted at abandoned stops on Main Street directing prospective passengers to the new locations.

A telephone dispatching system with connections at the end of each car line, and other important points controlled by central dispatchers to whom trainmen report before leaving starting points, will do much to keep the cars on proper headway and render the service more flexible. This method is superior to starters at terminals, as it keeps all cars in touch with a central authority and makes it possible to minimize irregularity.

The report also recommends that two additional lines be equipped with safety cars. This would make for a complete installation of cars of uniform design and appearance with the exception of the larger cars on the interurban lines.

Association News

Steps Taken Toward Cable Standardization

THE representatives of bodies interested in considering the advisability of undertaking the development of standards for wires and cables, other than for telephone and telegraph use, met on Feb. 2, 1921, at the Engineering Societies Building. The meeting was called by the American Engineering Standards Committee at the instance of the American Railway Engineering Association. Practically all the interests invited were represented by one or more individuals. Charles R. Harte, construction engineer the Connecticut Company, was the delegate for the American Electric Railway Engineering Association. It was unanimously voted that A. A. Stevenson, chairman of the American Engineering Standards Committee, who called the meeting to order, be requested to retain the chair. A preliminary note regarding the meeting was printed in the issue of Feb. 26. More details are given below.

The first question of whether unification should be undertaken was fully discussed by nearly all of the representatives present. It was agreed that the specifications and standards of the various organizations working in the field had generally been along similar lines and that it was desirable that they be unified so that uniform national standards might result. This work should be undertaken with a single general plan covering substantially all the more important uses. It appeared to be the unanimous opinion that the scope of the work should be limited in such a way that it would be a unification of specifications and standards already in existence rather than an attempt to formulate entirely new standards, except in fields not already covered. After a rather full discussion of the details of the subjects which should be covered it was decided that these should comprise the quality and stranding of the conductors, the various kinds of insulation and coverings and the sheath and armor.

It was the consensus of opinion that in order to promote export trade it would be desirable to have all the American wire and cable standards assembled in a single book. This form of publication, while giving due credit to the participating organizations, would appear to foreign wire and cable purchasers as a complete book of American standards rather than as the standard of societies comparatively unknown abroad. This has been done in a very thorough way by the Germans and also to a considerable extent by the British, thus placing Americans at a decided disadvantage in foreign trade. It was agreed that if such a book were prepared and given proper publicity in foreign countries it would remove one of the greatest difficulties under which American manufacturers now labor in developing export trade.

During the discussion of the various matters before the conference frequent reference was made to memorandum presented by the representatives of the American Institute of Electrical Engineers, summarizing reasons for undertaking the work, outlining what they consider a desirable scope for it, and sketching an outline for a committee organization for carrying it out. It stated that by far the largest single item of expense in electrical engineering projects is the cost of wires and cables. Also the element involving the greatest risk of life and property and of continuity of industrial power is in the wire and cable system. If standardization can reduce costs and decrease risks, it is obvious that this field presents unusual opportunities. Much work of an excellent character along the line of standardization of wires and cables has already been done, mostly, however, by organizations working in behalf of special industries. While a spirit of co-operation has prevailed, special requirements of those industries have created certain divergent tendencies which are probably susceptible of being reconciled by properly organized co-operation.

Two-Cent Coin Bill Dies

AT A meeting Feb. 26, 1921, in the Washington office of the association it developed that there was practically no chance of the 2-cent coin bill going through, it being too far down on the calendar to be called up. No further steps will be taken, as the bill dies automatically March 4.

Buildings and Structures Subcommittee Meets

A MEETING of the buildings and structures subcommittee No. 2, which is to report on the design of a typical shop building and shop layout, was held at association headquarters in New York City on Feb. 17. Those present were N. E. Drexler, Newport News & Hampton Railway, Gas & Electric Company, chairman; D. E. Crouse, Rochester & Syracuse Railroad, and C. W. Squier, ELECTRIC RAILWAY JOURNAL, the last-named representing the committee on equipment, which is co-operating with the buildings and structures committee on shop design.

After a general discussion of the subject was had the details were divided among the two committees and several subjects on which it is necessary to have information were outlined so that this could be obtained as soon as possible. The two committees will hold a joint session again some time in March.

Association Aiding I. C. C. in Determination of Depreciation Allowances

ON FEB. 5, 1921, the committee on a standard classification of accounts held a meeting at association headquarters, in accordance with action taken by the executive committee of the American Association, to consider the subject of depreciation as prescribed in the transportation act of 1920. Those present were H. L. Wilson, Boston Elevated Railway, chairman; Robert N. Wallis, Fitchburgh & Leominster Street Railway, and P. S. Young, Public Service Railway, Newark, N. J.

The transportation act of 1920 amends section 20 of the act to regulate commerce by providing that the Interstate Commerce Commission is to prescribe the classes of property for which depreciation charges may properly be included under operating expenses and the percentages of depreciation which shall be charged with respect to each of such classes of property. The carriers subject to this act are not allowed to charge to operating expenses any depreciation charges on classes of property or a percentage other than those prescribed by the commission.

The depreciation section of the Interstate Commerce Commission asked the co-operation of the American Association in the determination of these depreciation allowances and at the Chicago meeting of the executive committee the matter was referred to the committee on a standard classification of accounts. The committee discussed the subject generally and decided that it was necessary to have a conference with F. S. Fowler, chief of the depreciation section of the Interstate Commerce Commission, before it could proceed further with the work.

Engineering Executive Committee Meets

A FORMAL meeting of the executive committee of the Engineering Association was held at association headquarters on March 1, 1921, to consider special matters that had come up since the last convention.

Among those present were: President W. G. Gove, Brooklyn Rapid Transit Company; C. H. Clark, the Cleveland Railway; H. A. Johnson, Metropolitan West Side Elevated Railway; C. S. Kimball, Washington Railway & Electric Company; A. B. Stitzer, Republic Engineers, New York; J. W. Welsh, special engineer of the association, and E. B. Burritt, secretary.

Among the matters discussed was that of the resignation of First Vice-President C. L. Cadle, who is now superintendent of public works, State of New York. Under the terms of the constitution and by-laws it is within the power of the executive committee to fill this vacancy. The consensus of opinion, however, was not to fill the vacancy at this time and therefore any action was unnecessary.

J. W. Welsh reported on the work of the several standing committees. His report indicated that matters were well in hand and that the work for the ensuing year was progressing satisfactorily.

The standing committees had requested executive action be taken on several subjects. The committee on power distribution had asked for approval of the American Institute of Electrical Engineers being appointed sponsor for the specifications of aluminium wire, which was granted.

The request of the committee on way matters for permission to co-operate with the American Society for Municipal Improvements in the discussion of pavements and tracks in general was granted.

A plan was developed whereby the existing standards of the association may be brought promptly before the American Engineering Standards Committee for their approval. Under this plan each chairman of a standing committee will select such of his own existing standards as he desires to submit. Each standard in the list, accompanied by a history drawn in accordance with the rules of the committee, will be submitted to the Standards Committee of the association at its next meeting. After the selection has the approval of the last-named committee the matter will be turned over to the association's representative on the American Engineering Standards Committee for presentation to that body and approval.

The executive committee voted power to the president to appoint, with the secretary of the American Association, representatives with power to act on matters before the American Engineering Standards Committee. On this basis the appointment of Martin Schreiber as the official representative of the association, A. B. Stitzer as the association's representative on the subcommittee on terminal markings, C. R. Harte and F. J. White as the association's representatives on the subcommittee on wires and cables and C. W. Squier as the representative on the subcommittee on standardization of pipe flanges and fittings were approved.

It is planned to hold the next meeting some time in the early part of June.

Cost of Freight Traffic to Be Studied

THE joint T. & T. and Accountants' committee on express and freight traffic promotion and costs met at association headquarters on March 2 to plan an investigation as to what freight traffic on electric railways actually costs.

Those present were F. W. Coen, Lake Shore Electric Railway Company, chairman; A. R. Baxter, Indianapolis & Cincinnati Traction Company; T. C. Cherry, Rochester & Syracuse Railroad Company; J. H. Crall, Terre Haute, Indianapolis & Eastern Traction Company; L. T. Hixon, Terre Haute, Indianapolis & Eastern Traction Company; L. E. Lippitt, Auburn & Syracuse Electric Railroad Company; C. K. Savery, Connecticut Company; T. H. Stoffel, Westinghouse Electric & Manufacturing Company; C. E. Thompson, Chicago, North Shore & Milwaukee Railroad; A. F. Van Diense, Columbus, Delaware & Marion Electric Company, and W. K. Zinmeister, Rochester & Syracuse Railroad Company.

The committee considered the classification of accounts prepared by Mr. Zinmeister, made certain corrections and extensions and finally approved a form of classification which will be forwarded to a selected list of companies doing freight or express business. They will be requested to keep their freight and express accounts in accordance with this classification for a period of three months beginning March 1. The purpose of this phase of the committee's work is to secure actual figures as to what the cost of this service would be.

The chairman will assign to various members of the committee the duty of taking up the question of the adoption of this classification personally with executives of companies in their territory.

February Bulletins Now Available

SIX special reports and compilations were prepared by the Bureau of Information and Service of the American Association during February. One is a comparative financial statement of a large group of electric railway companies for 1920 compared with 1919. A second is a summary of replies on the free transportation furnished to employees and others. The third is a supplement to the previous compilation on one-man cars, giving information from six additional companies.

The titles of the other reports follow: "Analysis of Labor Agreements of Interurban Companies," "Effect of Establishment of 10-Cent Cash Fare," "Percentage of Ticket Passengers and of Free Transfers for a Number of Companies Having Various Cash and Reduced Ticket Rates of Fare."

In addition, up-to-date supplements have been prepared to the bulletins on wages of trainmen, cost of living and fares.

Meeting of Way Committee Well Attended

A MEETING of the committee on way matters was held at the association headquarters in New York City Feb. 23. The entire personnel of the committee, with one exception, was in attendance, and this one was excused from attending due to his long distance from New York. Those present were R. C. Cram, Brooklyn Rapid Transit Company, chairman; H. A. Abell, New York State Railways; C. A. Alden, Bethlehem Steel Company; Victor Angerer, William Wharton, Jr., & Company; W. R. Dunham, Jr., the Connecticut Company; E. B. Entwistle, Lorain Steel Company; H. F. Flowers, Differential Car Company; H. H. George, Public Service Railway; W. F. Graves, Montreal Tramways; E. M. P. Ryder, Third Avenue Railway, and T. B. Skelton, Metal & Thermit Corporation. Others present who were invited to furnish information and co-operate with the committee were H. A. Benedict, Public Service Railway; J. C. Jameson, Dayton Mechanical Tie Company; H. F. A. Kleinschmidt, Lorain Steel Company; C. W. Squier, ELECTRIC RAILWAY JOURNAL, and R. W. Steigerwalt, Carnegie Steel Company.

A general discussion of the eight subjects on which this year's way committee is to report took place and the further procedure necessary for following the program was outlined. The discussion on results obtained from arc-weld joints showed that these vary to quite an extent, and it was the general opinion that the skill of the operator had a very important effect on the results obtained.

In connection with the subject of substitute ties for use in paved streets J. C. Jameson was invited to outline the advances and results obtained from installations using the Dayton mechanical ties. Other manufacturers have been asked to present similar information regarding their products at subsequent meetings of the way committee. The committee decided that other manufacturers of substitute ties are to be asked to supply the committee with a list of users and that the subcommittee on this subject is to prepare and send out a questionnaire to these users for obtaining additional information.

In the discussion of the possible advantages of curved contours for treads of new wheels H. A. Benedict represented the committee on equipment and presented blueprints of a large number of contours taken from worn wheels, which had been prepared by R. H. Dalgleish, chief engineer Capital Traction Company, Washington, D. C. H. F. Flowers, chairman of the way subcommittee on this subject, presented some blueprints arranged to show the theoretical advantages of a curved contour as they appealed to him. After an animated discussion of the subject, the committee decided that discussion and theorizing would produce no beneficial results, but the most advantageous course would be to have tests made in actual operation and thus determine results from practical consideration. The committee decided to leave the making of further tests and their following up to the committee on equipment.

The subcommittee on specifications for special trackwork reported progress and expects to have a report ready for discussion at the next meeting.

Under the subject of standardization of frogs and track center distances it was decided to recommend for adoption as "Recommended Practice" the eight distances as proposed in the 1920 way committee report, these to be recommended for use in special trackwork layouts for all track gages. The subcommittee submitted tables and data in connection with the standardization of branch-off frogs and was requested to prepare same in suitable form for publication as a progress report. Similar tables and plans covering a proposed standard method of design for car clearance curves, using association spirals, were submitted and referred back for further study along suggested lines.

Considerable progress was made in the study of a proposed revision of the recommended design of layouts for switches and mates. Certain of the switches are to be proposed for raising to standard and certain others are to be dropped, if the report of the committee is accepted by the association. Some of the switches are not now used and others have but little use, according to data which the subcommittee has secured.

The subject of standardizing frog angles in crossovers and turnouts was brought up and referred to the subcommittee, with the view of reconciling the slight differences now found in the designs of the several manufacturers. There appears to be no good reason why the same frog angles should not be used by all companies.

In connection with the subject of wood preservation the subcommittee was ordered to complete its proposed questionnaire for issuance as soon as possible. The subcommittee has made great progress in assembly of specifications for preservative oils, analysis and treatment methods. It is hoped to arrange for co-operation with several other national societies which have the same subject in hand.

The committee expects to meet again on April 6.

Camden Company Section Meets

THE monthly meeting of the Camden company section, No. 13, was held on Feb. 17. The speaker of the evening was William A. Searle, secretary-manager of the Chamber of Commerce of Camden, who in an interesting and instructive discourse spoke of the Chamber of Commerce as an institution that takes an interest in everybody's business without selfish motives, but with the main object of serving the city in all capacities. The speaker then considered the transportation situation from the point of view of a person outside of the railway organization, looking in, instead of on the inside, looking out. He showed how the motormen and conductors can by their courtesy to the patrons of the road and by their personal appearance restore the confidence of the public in the railways.

The slogan that Mr. Searle suggested was "A Voice with a Smile." Another suggestion worthy of serious consideration was that of having a "Good Morning Week." He brought out that a way to seek a personal touch with the patrons of the lines is to have a card in the car to inform the public whether it was "Dick" Jones' or "Fatty" Arbuckle's car on which they obtained efficient service and received courteous treatment. In driving home his point he did not offend the rank and file of the men; on the other hand they liked his line of argument and were not afraid to come back in the same spirit.

Martin Schreiber, manager Southern Division Public Service Railway, in closing the meeting, stated how important it is to hear both sides of the transportation question and called attention to the fact that for three days 400,000 passengers had been carried in the Southern Division daily without a single delay.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
• PERSONAL MENTION

Mayor Denounces Council

Chief Executive of Seattle Objects to Declaration that the Municipal Railway Is Making Money

The City Council of Seattle, Wash., has adopted a resolution, with only one dissenting vote, declaring that the receipts of the Municipal Railway under the present 8½-cent fare are adequate to pay all wages, maintenance and interest charges, and leave more than $1,000,000 a year to meet the first redemption payment on the $15,000,000 of bonds issued in payment for the railway system. The resolution added that it was not the intention of the Council to resort to taxation to support the railways, unless it was expressly directed to do so by vote of the people. The measure declared that figures based on thirty-four days' receipts up to Feb. 10 showed the lines would make $1,060,000 a year above interest charges.

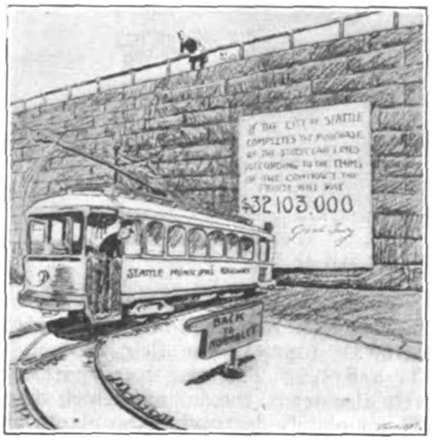
Mayor Hugh M. Caldwell, in discussing the resolution, denounced the City Council for its action in passing such an ordinance. Mayor Caldwell said:

> The action of the Council in passing the resolution is directly opposite to the recommendations of the grand jury. Instead of taking or authorizing some action to obtain relief from the present contract this is designed more securely to fasten it upon us. The resolution will doubtless make its appearance in the litigation now pending. The people may find some solace in the fact that the resolution of the Council at least agrees with the grand jury report in so far as it finds that the street railways are being properly managed.
>
> The resolution ignores the report of the city comptroller showing that the city expended from the general tax revenues in 1919 on account of the municipal railway properties $105,725, and for 1920, $117,803, and that estimated on the budget for 1921 the city intends to expend from the same source for the same purpose an additional $182,777, or for the two years and a fraction, from the general tax revenues for the nine months of 1919, for 1920 and 1921, $406,305, unless perchance the $182,000 expenditure for 1921 is restrained by the court.
>
> I have not been able to find in the resolution even an optimistic forecast of when the $83,000 heretofore borrowed from the general fund may find its way back to that fund.

COUNCIL'S FIRST COMMENT

The resolution was the first expression by the Council on the railway situation since the grand jury and Mayor Hugh M. Caldwell reported some weeks ago on their investigations of the city's purchase of the lines. The ordinance was referred to the utilities and finance committees without debate. The text follows:

> Whereas, the financial condition of the Municipal Street Railway system is being misrepresented to the discredit of said system and of the city; and,
>
> Whereas, in fact the receipts of said Municipal Street Railway system during thirty-four days, up to and including Feb. 10, 1921, and including the last day's operation under the 6¼-cent fare, aggregated the sum of $624,525, a daily average of $18,368.30, or an indicated annual receipt of $6,704,642; and,
>
> Whereas, the average of the expenditures for November and December, 1920, January, 1921, and estimated expenditure for February, 1921, will approximate $470,000 a month, which said sum includes a monthly allocation of interest on all utility and general bonds issued in connection with the municipal street railway system, or a prospective annual expenditure of $5,640,000, including all of such interest, indicating that during one year's operation on the present rate of fares, with similar receipts and expenditures, there will be a balance remaining for application toward the payment of principal on outstanding bonds approximating $1,060,000, or that on March 1, 1922, there will be an approximate balance of $1,220,000 for such purposes; and,
>
> Whereas, the expenses of said Municipal Street Railway system are decreasing; and,
>
> Whereas, the experience of the Municipal Street Railway has shown that January and February are two of the poorest months of the year from a revenue standpoint; and,
>
> Whereas, it is apparent from the foregoing that the revenues to be derived from the Municipal Street Railway system will be more than sufficient to meet all amounts properly chargeable thereto. Now, therefore,
>
> Be it resolved, by the City Council of the city of Seattle, that the city railway fund is a solvent fund, and will be more than able to meet all lawful charges against the same.
>
> Be it further resolved, that it is not the intention of the City Council of the city of Seattle to resort to taxation or to any fund dependent thereon for the purpose of maintaining or operating said Municipal Street Railway system nor to pay any utility bonds, or interest thereon, by taxation or from any fund dependent thereon, unless expressly directed so to do by vote of the qualified electors of the city.


IF THE CITY OF SEATTLE COMPLETES THE PURCHASE OF THE STREET CAR LINES ACCORDING TO THE TERMS OF THE CONTRACT THE PEOPLE WILL PAY
$32,103,000
Grand Jury
SEATTLE MUNICIPAL RAILWAY
BACK TO NORMALCY

MUNICIPAL RAILWAY UP AGAINST STONE WALL, SAYS SEATTLE "TIMES"

Another Wage Cut Proposed

Officials of the Manchester (N. H.) Street Railway have proposed a general 20 per cent reduction in the wages of all employees to become effective on April 1.

Approximately 300 employees will be affected. The present rates for trainmen are 60 cents an hour after one year of service. Officials of the company do not anticipate any immediate reduction in the fare, which is 8 cents.

This rate, the officials claim, is now larger than in most New England cities.

$4,000,000 Electrification Plan

Municipal Delegates Consider Change in Power on 80 Miles of Grand Trunk Railway

Delegates from all of the municipalities served by the London, Huron & Bruce branch of the Grand Trunk Railway, operating between London and Wingham, Ont., convened at London on Feb. 23 to consider a proposal to electrify the line as a hydro radial similar to the present London & Port Stanley Railway.

DOMINION GOVERNMENT TO BE APPROACHED

They unanimously adopted a resolution requesting the Hydro Electric Power Commission of Ontario to "approach the Dominion Government with a view to acquiring, leasing or securing running rights over" the road "on behalf of the municipalities through which it operates"; and also requesting the power commission to supply the municipalities interested "with a report showing the estimated cost of the line, electrified, and equipped for satisfactory service, together with estimates of the probable future earnings, operating costs, etc., as provided for by the hydro radial act."

It will now be necessary for the individual municipalities to adopt the same resolution before action can be taken by the commission.

The proposal for electrification was first advanced by Vice-Chairman Philip Pocock of the city of London Commission in charge of operation of the London & Port Stanley Railway. The meeting which followed was held under the auspices of the London City Council and Chamber of Commerce. All of the delegates defined their attitude as favorable to the scheme if its feasibility from a financial standpoint is proved by the reports of engineers that are now to be secured.

OPPOSITION TO SCHEME ALLEGED

Louis A. Wood, professor of economics of the faculty of Western University, London, Ont., basing his computations on the percentage increases in costs of the principal materials required, and the fact that electrification of the London & Port Stanley Railway cost $20,000 a mile six years ago, declared that the cost of the London, Huron & Bruce enterprise would be $50,000 a mile, or a total of $4,000,000 for the 80 miles between London and Wingham. His calculations were disputed. The allegation was made that anti-public ownership interests are already further distributing literature among rural councils and farmers' clubs in an effort to kill the scheme.

The movement is regarded in Ontario as having political aspects of a most important character in view of the fact that Premier Drury, as chief of the United Farmers' government now in power in that province, has held up all hydro-radial plans of the Hydro Electric Power Commission pending receipt of the findings of a government royal commission that has been given widest powers to conduct an impartial investigation.

RURAL DISTRICTS FAVOR PLAN

All rural delegates at the London convention declared that their municipalities would vote the necessary funds if the report proved favorable. The rural districts are also keenly anxious to participate in the benefits of distribution of electricity generated at Niagara Falls, and the hope is held out that the extra load consumed by the railroad would cut farm power costs $5 to $20 a horsepower a year.

Several United Farmers' Clubs, which are the source of Premier Drury's power, have assumed the attitude that the project in all its ramifications must be proved to them to be highly desirable before they will approve it, while a few others are as yet undecided in the matter.

The road would have to be acquired from the Dominion Government because of the fact that the whole Grand Trunk system is now being taken over for incorporation in the Canadian National Railways.

Disastrous Fires in Boston and Levis

Fire losses of $630,000 were sustained recently by the Boston (Mass.) Elevated Railway and the Levis County Railway, Levis, Que., in conflagrations which destroyed carhouses of these companies. The Boston fire caused a loss of $400,000 to the Boston "L" and the Levis County fire caused a loss of $230,000 to the Levis County Railway.

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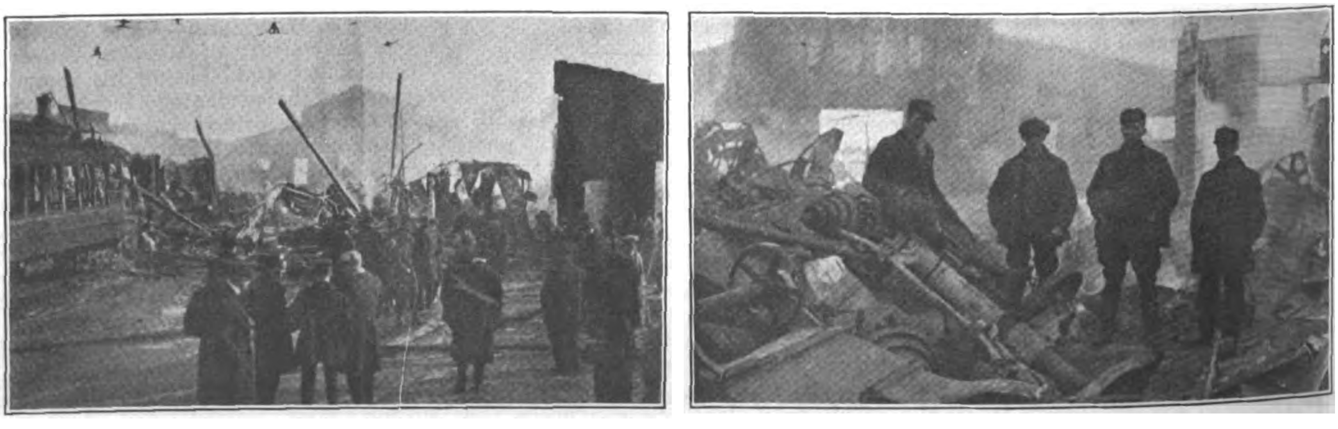
THE TWISTED WRECKAGE OF THE BOSTON CARS

Details of the rolling stock destroyed in the fires were published in the ELECTRIC RAILWAY JOURNAL for Feb. 26, pages 415 and 429. The fires were particularly disastrous, the damage which they did completely destroying the plants as is indicated in the accompanying illustrations.

The equipment destroyed in the fire at Levis included fifteen cars, four sweepers and two plows, representing the entire rolling stock of the company with the exception of six cars. The equipment which was destroyed at Boston included twenty-three articulated cars, eight semi-convertible cars, four trailers and four miscellaneous cars on plows.



TWO PICTURES SHOWING DEVASTATION BY FIRE AT LEVIS

Mayor Couzens Pleased

Detroit's Chief Executive Well Satisfied with Municipal Railway Progress —First Lines Now Open

In Mayor Couzens' recent message to the City Council of Detroit, Mich., interesting data were presented relative to the activities of the city of Detroit in constructing the municipal railway. The policy of the administration on railway matters for 1921, according to the Mayor, will be that announced in 1920 and approved April 5, 1920, by 63 per cent of the voters.

RAILWAY'S IMPROVEMENT SHOULD NOT BE HINDERED

The fact is recalled that during the past two years $65,000,000 has been appropriated for public improvements, including $15,000,000 for the municipal railway. It is stated that while the present problem is to reduce general expenditures to a minimum by business-like judgment the progress of programs already under way should not be hindered.

On Dec. 30 last the Street Railway Commission had presented by its manager figures showing that the railway plan under which they have been working is financially correct as to construction estimates made to the people at the election April 5, 1920. The 18½ miles of track built during the past nine months have cost, including the overhead, between $95,000 and $97,000 a mile. The commission is now in a position, however, whereby it may build the best type of railway construction for $62,649 per mile.

PROGRESS EXPECTED BY END OF YEAR

Considerable trackage to be built during the coming spring and summer in unpaved streets may be built for as low as $35,000 a mile. This will bring the average cost of the construction of the 100.75 miles of track proposed in the A and B groups in the ordinance approved last April to a price considerably below the $70,000 figure estimated last April when the plan was proposed.

The Mayor stated that the construction progress to date shows that the remaining 62 miles of track in the A and B groups can be built by Dec. 1 of this year.

The first section of the Municipal Railway is now in operation.

Lower Wages and Fares Planned

Trustees of Eastern Massachusetts Street Railway, Operating 730 Miles, Plan to Rewrite Union Contract

The trustees of the Eastern Massachusetts Street Railway, Boston, Mass., have notified their employees who are members of the Amalgamated Association that they do not intend to renew the existing contract as to wages and working conditions. This contract expires on May 1. The trustees sent a formal letter to the secretary of the joint conference board of the Amalgamated, copies being furnished to all the local papers.

THE trustees call attention to the fact that the present wage scale was established as a result of arbitration last September, giving the men a 20 per cent increase based upon the then estimated increase in the cost of living. The trustees now contend that this cost of living has decreased more than this percentage, that wages in many industries have been decreased in accordance with living costs and that the public has a right to expect the wages of the railway employees to be no exception.

The reduction in wages is justified, in the opinion of the trustees, by the fact that the United States Labor Bureau of Statistics and other authorities figure that the cost of living has declined more than 20 per cent since May 1, 1920.

BACK TO OLD WAGE

This reduction will make the basic wage what it was prior to the award of the arbitration board of Sept. 11 last, which award was retroactive to May 1. An outline of this award was given in the ELECTRIC RAILWAY JOURNAL.

The present scale paid is 56 cents an hour for the first three months' service, 58 cents an hour for the next nine months, and 62 cents an hour thereafter. Prior to the adoption of this scale the rates were respectively 46, 48 and 51 cents an hour. The last increase was approximately 20 per cent, and with the bonus of 5 cents an hour for one-man cars increased wages $1,400,000 a year.

This is the first step in New England toward a reduction in electric railway wages, and it is said that a return to the 5-cent fare is the ultimate object of the trustees. The trustees also plan to reduce fares in many places simultaneously with the reduction in wages.

UNION PLANS COUNTER PROPOSITION

The presidents of the carmen's unions have declared that the men will not willingly submit to the cut in wages. The union plans to take up the matter in special meetings and offer a counter proposition and endeavor to secure its acceptance by the company. Undoubtedly the controversy will be carried to an arbitration board if an amicable settlement cannot otherwise be secured.

In their letter the trustees said:

> The existing agreement between this company and the Amalgamated Association and the several divisions thereof runs up to and including May 1, 1921. The public trustees hereby notify you that the company does not desire to renew said agreement and that effective May 2, 1921, it cancels and terminates each and every section of said agreement.
>
> The public trustees have taken this action because experience has proved that many conditions of the existing agreement have been detrimental to the best interests of the car riders and make it extremely difficult to operate this street railway efficiently and for the benefit of the public.
>
> The company will take up with your association at any time the subject of a new agreement much simpler in form than the present agreement.
>
> Last September an arbitration award increased wages of employees of this company 20 per cent, effective from May 1, 1920, to May 1, 1921. This increase was based upon increased cost of living up to May 1, 1920.
>
> According to the United States Labor Bureau of Statistics and other authorities the cost of living has declined more than 20 per cent since May 1, 1920.
>
> Wages in practically every industry have been and are being reduced in accordance with the decrease in the cost of living and the public naturally has the right to expect that wages of street railway employees shall be no exception.
>
> If street railway wages remain at high war levels while the wages of every one else are being reduced substantially lower car fares will be impossible.
>
> Therefore, we advise you that on and after May 2, 1921, the basic rates of wages that prevailed prior to the last increase, which became effective May 1, 1920, will be restored; the differential for one-man car operators will remain at 5 cents.
>
> Fares will be reduced in every district on the Bay State System on the day when this change in wages takes effect.

The contemplated reductions will affect not only the men employed in the car service but also the men in other capacities, such as power house men, linemen, laborers and other classes whose pay now ranges from 62 to 92 cents an hour. They would also be returned to the same basis as before the Ogburn arbitration board's award. Though all these classes are not treated as members of the union their wages are maintained in proportion thereto.

Service-at-Cost Grant Passed in Findlay

By a vote of six to one a service-at-cost railway franchise has been granted to the Toledo, Bowling Green & Southern Traction Company by the City Council of Findlay. Under the terms of the new agreement the initial fare on the lines in Findlay is to be 8 cents, an increase of 3 cents over the present fare. A stabilizing fund of $20,000 is set up to regulate fares.

A commission of three members will control service on behalf of the city. The commissioner is to be the service director of the city.

The company will receive an annual return of 7 per cent upon the property valuation. The company has ten days in which to accept or reject the new ordinance.

Councilman J. W. McCormick dissented on the passage of the ordinance. He has threatened to call a referendum on it. He said opposition had been growing because the plan released the company from paving between tracks.

Mayor T. M. Mitchell signed the ordinance and sent it to the company on Feb. 17. It has since been accepted by the company.

Senator Has His Inning

Mr. Johnson Appears Before Committee at Albany in Opposition to Utility Bills

Supporters of the public utility legislation fostered by Governor Miller of New York outnumbered by far the opponents of the relief measures at the public hearing at Albany on March 2. Mayor John F. Hylan, Comptroller Charles L. Craig and President F. H. La Guardia of the New York Board of Aldermen were on hand to oppose the Governor's bill. United States Senator Hiram W. Johnson of California, retained by the Hylan Administration to fight the Governor's transit program, easily was the star orator of the opposition. Spokesmen for several up-State cities appeared, a majority going on record as opposing the bill.

Former City Comptroller William A. Prendergast bore the brunt of Senator Johnson's attack. In answer to the charge that Governor Miller's bill endangered the principles of home rule, Mr. Prendergast showed that on one occasion Mayor Hylan himself had appeared in opposition to a bill to end "Death Avenue" in New York and caused the power to settle the matter to be taken from the Board of Estimate.

Aligned with Mr. Prendergast were former Comptroller Herman A. Metz, former State Tax Commissioner Martin G. Saxe, Joseph Levenson and Mrs. Francis H. Kelly, all from New York.

There were fewer than a dozen speakers for the opposition. Its principal spokesmen, besides Senator Johnson, were Comptroller Craig, Aldermanic President La Guardia, Corporation Counsel John P. O'Brien of New York, and Mayor George R. Lunn of Schenectady.

Senator Johnson declared that the Governor's bill violated both the State and the Federal Constitution in that it proposed to confiscate the 5-cent fare, which was "a property right of which the people of the city cannot be deprived, except with the consent of the city."

Senator Johnson said that the remedy of the city's transit evils was to give it a fuller measure of home rule, a broader grant of power to manage its own affairs, including the transit situation.

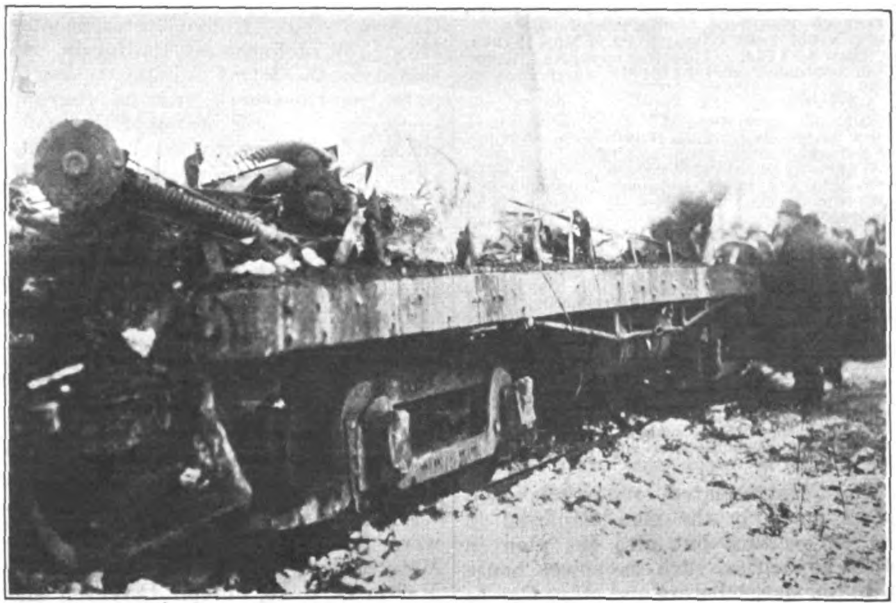
On this point he said:

> This bill makes a mockery of home rule and of self-determination. Who has the ultimate right under our institutions to govern? You may say that the city of New York may govern itself ill. That is no answer. Under our system—in our democracy—every community has the right to govern itself as it sees fit—govern itself well, we pray, but govern itself ill if it desires.

Mayor Hylan filed a brief setting forth his views. Comptroller Craig declared that the city of New York had rights which antedated and rights the State had bestowed upon it, and which for this reason could not be taken away by the State. Among them, he said, was the right to say on what terms its public utilities should be operated. President La Guardia of the Board of Aldermen denounced the bill as a measure "the dominent note and minor motive" of which was an increase in fares.

Prior to the hearing, Governor Miller addressed a delegation from New York City, composed of several hundred men and women representing civic societies, trade and taxpayers' organizations. He did not attend the hearing.

The hearing was had before the Senate Public Service and Assembly Judiciary Committees, which have custody of the Transit bill. At the beginning of the hearing two hours were allotted to each side to make its arguments.



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RUINS OF CAR IN COLLISION AT BRIDGEPORT

Purchase Ordinance Passed at Detroit

The ordinance providing for the purchase of eight lines of the Detroit United Railway built under the day-to-day agreement was passed by the City Council on Feb. 24. It will go before the voters at the election on April 4. Approximately 25 miles of trackage are involved in the proposed purchase.

Construction work on the Harper Avenue line was stopped by the Council before the road was ready to operate by rescinding the agreement under which the line was being built. It is not included in the lines named in the purchase ordinance.

Provision for the payment for the day-to-day lines, if purchased, will be made from the $15,000,000 bond issue voted last year.

The service-at-cost ordinance passed out of the Council's hands with the expiration of the thirty days consideration period. No action was taken on the ordinance and according to the provisions of the city charter, it automatically goes on the ballot for the April 4 election.

Responsibility for Connecticut Wreck Not Yet Fixed

No finding has as yet been reached in the matter of fixing the blame of the trolley accident which occurred near Shelton, Conn., on Feb. 22. An inquest was held Feb. 24 by the coroner. There were present at this hearing E. I. Rudd, chief engineer of the Utilities Commission, with two assistant engineers; Manager Porter and Superintendent Kibling of the Connecticut Company; Motorman Sherman and Conductor G. Mills of the northbound car, a claims investigator and many passengers who escaped injury. The coroner's verdict is not expected for several days. The evidence so far brought out would seem to indicate that the inflammable contents of a package being carried by a passenger of one of the cars really was responsible for the high toll of deaths, now numbering ten. The accompanying illustration shows how completely the superstructure of one of the cars was destroyed by fire following the collision.

Municipal Ownership Election Upheld

The Supreme Court of the United States on Feb. 28 declared legal the election held last April at which the expenditure of $15,000,000 was voted by residents of the city of Detroit, Mich., for the construction by the city of an electric railway. The case was carried to the Supreme Court by the Detroit United Railway after Judge Tuttle in the federal court at Detroit had ruled that no federal question was involved. Judge Tuttle had been asked to enjoin the city from constructing the railway as provided in the plan sponsored by Mayor Couzens.

News Notes

B. J. Arnold Refuses to Quit.—In a letter written to Mayor Thompson of Chicago on Feb. 21, Bion J. Arnold refused to obey the Mayor's demand that he "cease to pretend to act" as the chairman of the Board of Supervising Engineers. The Mayor had stated that the board was without authority to act on transportation matters because the 1907 franchises of the companies had been cancelled. Mr. Arnold said he would continue to perform his duties until he had been legally relieved.

City Official Sentenced.—Charles L. Craig, Comptroller of the City of New York, was recently sentenced to sixty days in the Essex County Jail in Newark, N. J., by Judge Mayer in the United States District Court. Mr. Craig was immediately taken into custody but has been paroled pending an appeal. The charge of contempt of court grew out of a communication between the defendant and Public Service Commissioner Nixon in which Mr. Craig is said to have asserted that federal justice prohibited investigation by the city into the records of the Brooklyn Rapid Transit lines' receiverships.

Commission Measure Passed Over Veto.—The veto by Governor Edwards of New Jersey of the bill creating a new three-man public utility commission has been overridden by the Senate. As soon as the House passes the bill over the veto it will be a law, and it will then be the duty of the Governor to nominate the commission provided for. Under the bill, the power of removal of the board is taken from the Governor, and it was because of this feature that Governor Edwards vetoed the measure. The members of the former commission were removed by the Governor. They carried the case against them into the courts and the Governor was sustained in dismissing them.

Chicago Councilmen to Study M. O.—Members of the local transportation committee of the City Council of Chicago have arranged to make a three weeks' tour of investigation through western cities, starting March 4. Money for the trip was drawn from the traction fund which has been accumulated from payments made to the city during the past thirteen years by the Chicago Surface Lines. The committee will make a study of municipal ownership and operation of street railways, parking regulations, traffic rules, including those governing one-way streets, and the skip-stop system. The Aldermen will visit Kansas City, Denver, Salt Lake City, Los Angeles, San Francisco, Portland, Seattle, Vancouver and St. Paul.

Financial and Corporate

Mr. Seaman Loses

Supreme Court Rules Against Him on One Count in His St. Louis Receivership Suit

The Supreme Court of the United States has overruled the petition of John W. Seaman, represented by Attorney Ephraim Caplan of St. Louis, for a writ of certiorari to review the decision of the United States Circuit Court of Appeals, which recognized the receivership suit filed by Samuel W. Adler against the United Railways, St. Louis, Mo., to the exclusion of Mr. Seaman's earlier suit for a receivership.

The motion for a writ of certiorari was filed in the Supreme Court on Dec. 17. It was the second of two steps which Attorney Caplan took in appealing from the Court of Appeals to the Supreme Court. The other and earlier step was an appeal in regular form. This appeal is still pending. It is not known when the Supreme Court will pass on it.

In the Seaman receivership petition the United Railways was charged with waste of its assets and it was sought to hold individual directors responsible. While this suit was pending Mr. Adler, in April, 1919, filed a receivership petition alleging merely that the company was insolvent. The company promptly admitted its insolvency and Judge Dyer granted a receivership decree and appointed Rolla Wells receiver.

Judge Dyer later announced that the appointment of the receiver was made under the Seaman petition. Before anything could be done to meet the requirements of the Seaman petition, Mr. Adler appealed from this decision and the Circuit Court of Appeals upheld him. This took the case away from Mr. Seaman and removed the requirement for an investigation of the company's affairs before the receivership or for an accounting on the part of the directors. No move for any such investigation has been deemed necessary under the present receiver.

In the appeal petition, which is still pending, the Supreme Court is asked to overturn this action of the Court of Appeals and to reinstate the Seaman petition as the one under which the receivership is decreed. If this should be done Mr. Seaman's counsel would proceed with the movement for an investigation and an accounting.

Scaling Down of Capitalization Suggested

T. Russell Robinson, manager of the Keene (N. H.) Electric Railway, has sent out to bondholders and stockholders of the company a proposition for the reduction of the financial obligations of the company by about 50 per cent and for obtaining $15,000 under a prior lien, to be used to purchase new equipment believed to be essential to enable the road to continue in operation. As a part of this plan the City Councils of Keene have been asked to make a similar reduction in a claim of about $4,800 against the railway company.

It is proposed that the payment of $80,000 of first mortgage 5 per cent bonds due on Oct. 1, 1920, be made by issuing the holders proportionally new first mortgage 7 per cent bonds of a par value of $40,000, to mature in twenty years, subject to a prior lien of $15,000 car trust notes maturing in equal monthly payments over sixty months. If the bondholders consent to accept the new bonds aggregating in value 50 per cent of their present holdings, it is then proposed to reduce the 6 per cent preferred stock of the company from $70,000 to $35,000 and the common stock from $75,000 to $35,000 and if necessary to issue 7 per cent bonds to a certain amount to aid in re-equipping the road.

If the plan of rehabilitation proposed can not be carried out, the manager appears to be of the opinion that the operation of the road cannot continue for long, and in that case, the scrap value of the plant, with its buildings and real estate, might be considerably under $50,000.

The road comprises in the main 10 miles of single track with turnouts, nine cars, two snow plows, carhouse, station and machinery and amusement park equipment at Swanzey.

Massachusetts Commission Will Investigate Abandoned Lines

The Massachusetts Department of Public Utilities has been ordered by the States Legislature to investigate and report on or before April 1, 1921, on the necessity and feasibility of restoration of service on abandoned street railway lines, and also to furnish a comparison of costs of transportation by street cars and auto buses. The order requires investigation of the following specific points:

1. What lines of street railway, whether in operation now or not, are necessary to promote the public welfare and convenience in the localities served?
2. Is it necessary or advisable to provide by legislation or otherwise for the restoration of service on any discontinued lines?
3. Is it necessary or advisable to provide by legislation or otherwise for the continuance of service on street railways now in operation at a popular unit fare, with the additional cost to be borne by the public, and, if so, how should the cost be apportioned?
4. Is it advisable to provide by legislation for the Commonwealth to own and operate lines deemed necessary for the public welfare and convenience?

The department plans to hold a public hearing at an early date.

Three Charters Sought

Receiver of Shore Line Seeks to Expedite Retention of Branches in Operation

Division of the Shore Line Electric Railway of Connecticut into three parts in order better to dispose of the property and to enable it to continue operations is provided in a bill on which there was a hearing in Hartford on Feb. 24 before the committee on railroads of the General Assembly. Robert W. Perkins, the receiver, asks for three charters, each charter to apply to a section of the road.

Edward M. Day, counsel for Mr. Perkins, said that the line from New Haven to Saybrook to Chester had not been operated lately and a section of trackage had been sold to Louis Levinson, New York City; that the line in Stonington and Groton was now being operated, and that the section from Norwich to Westerly was in partial operation though its discontinuance had been authorized by the court.

Mr. Day said the receiver could not sell the entire system, nor sell sections of it and give the purchasers the right to operate, because the charter covered the whole system. The passage of the bills before the Legislature would enable syndicates to purchase the property very cheaply and to continue its operation.

ORIGINAL PURCHASER IN DEFAULT

Mr. Perkins stressed the point that it was impossible to reorganize and operate the system as a whole. The rails from Chester to New Haven, purchased by Mr. Levinson, were to have been taken up by Dec. 31, but Mr. Levinson had not done so. Mr. Perkins said that he would like to see Mr. Levinson restore the section to operation.

Marion W. Davis, East Lyme, said that he was anxious that trolley service continue for that town. The 6-mile line to Crescent Beach was used a great deal by summer residents.

Charles L. Whittlesey, New London, speaking on the advantage of separating the Niantic-Crescent Beach line from the New London-Flanders section, said that 85 per cent of the traffic was now on the Flanders line while the remainder was for the branch line which, he said, was run at a loss last summer.

POSSIBILITY OF JUNKING ROAD

Mr. Davis said that the fare to New London was at present 40 cents and that he could not see why such a rate should not pay on a run of 11 miles. Mr. Wittlesey's answer was that the Niantic section was not paying and that if some disposition could not be made of it between now and next summer it would be ripped up and sold for junk.

James A. Bathgate, a factory owner of East Lyme, believed that the complete line should be retained for the development of the community. Selectman Charles Cone, East Lyme, said, that people would be content to go without service when traffic was insufficient to defray the cost of operation.

Service Restoration Ordered

Public Service Commission Directs Syracuse & Suburban to Reopen Line—Autos Refused Rights

The Syracuse & Suburban Railway, which suspended operations on Jan. 1, 1921, owing to the alleged impossibility of continuing operations at a profit, has been ordered to restore service between the town of Manlius and the city of Syracuse on March 7. Public Service Commissioner John A. Barhite granted the order for the restoration of service on the complaint of members of the Town Board of Dewitt.

The board maintained that the railway had illegally suspended operations in not gaining the permission of the Public Service Commission as required by law, in which it was upheld by the commissioner. Attorney Paul Shipman Andrews, who was said to be the representative of bus lines interests, endeavored to impress upon the judge that the railway could give no assurance of continual and satisfactory service, owing to its financial condition.

Judge Barhite cited the statement of the company to the effect that it continued to recognize the jurisdiction of the commission and would therefore attempt to reorganize by the stipulated date if weather conditions and equipment would permit. The commissioner stated that if it was then evident that the company could not continue to operate satisfactorily complaints could be brought against it and the question taken care of at the proper time.

C. Loomis Allen, general manager, stated in regard to the possibility of further trouble in negotiating with employees regarding wages that if it became necessary non-union men would be employed, the Syracuse & Suburban forfeiting the right to operate into the city of Syracuse, farther than the corner of Montgomery and Fayette Streets. The cars were formerly operated over a section of the city lines by special arrangement with the New York State Railways, which employs all union workmen.

Bus line interests were unable to obtain franchises for the operation of automobile buses over the old suburban route, owing to the fact that the town of Dewitt and the village of Manlius opposed any substitution for the street cars until it was proved that electric railway service could not be regained.

California Tax Measure Attacked

A bill similar to the so-called King tax bill, previously passed in the Senate of California, but defeated in the Assembly, has been advanced for reintroduction and consideration in the Senate. This measure proposes to raise the $14,000,000 deficit in the state's budget for the next two years by increasing the tax rates on gross income of public service corporations 34.98 per cent (railroads, street railways, for example, from 5¼ per cent to a fraction over 7 per cent) and by increasing the taxes on banks, franchises and insurance companies a like amount.

The committees in the Senate and Assembly called upon the public utilities to be represented in an open hearing in order to discuss this taxation measure. These representatives of the public service corporations, by their frank submission of facts and figures, succeeded in defeating the bill at its first introduction.

Public service corporations claim this bill unfair, unwise and unnecessary, as the utilities are already taxed more in proportion to value than other property. Should the King tax bill be approved the Pacific Electric Railway would pay 130 per cent increase over the taxes it paid the state during the period 1915-1916.

The utilities consider the measure unwise since it would compel them to raise their rates if they are to show earnings which will attract capital for expansion. The measure is also considered unnecessary if certain economies are practiced by the state. A reasonable tax in this situation is suggested to be one related directly between the expense of creating and maintaining the state's system of public highways and those who derive the benefits therefrom. For permanent improvements, which it is now sought to pay out of current revenues, it is recommended that bonds be issued.

Since the adjournment of the first session of the Legislature, Governor Stephens has personally and actively stumped the state in favor of the King tax bill, endeavoring to obtain support of this measure when it is brought up for reconsideration at the second session of the Legislature, convening on Feb. 24.

Only $36,253 Available for Dividends in Louisville—Appraisal Proposed

Stockholders of the Louisville (Ky.) Railway and the Louisville & Interurban Railroad re-elected directors and officers at the annual meeting on Feb. 16. J. P. Barnes, president, told stockholders that J. G. White & Company, New York, had been engaged to make a detailed inventory and valuation of the company's urban property to set at rest criticism that the company is overcapitalized.

The balance available for dividends on stock at the end of 1920, Mr. Barnes stated, was $36,253, as compared with $157,504 in 1919 and $424,108 in 1918. The operations during 1919 were affected by the strike of employees, he pointed out.

Mr. Barnes declared the policies of the directors and officers were shaped toward the carrying out of the following obligations:

1. To render adequate service to the public of Louisville.
2. To maintain an adequate living wage scale for our employees.
3. To pay a reasonable rate of return on the amount invested in the property used in the service of the public.

Holding Company Eliminated

$15,000,000 of Stock Wiped Out—Local Control for the Buffalo Company Under Mitten Management

The board of directors of the International Railway, Buffalo, N. Y., on Feb. 25 closed a contract by which the Mitten Management, Inc., will supervise the management and rehabilitate the International Railway property. The undertaking is very similar to the arrangement under which so much has been accomplished during the past ten years in Philadelphia.

DIRECTORATE UNCHANGED

The board of directors of International Railway remains unchanged. T. E. Mitten is chairman of the executive committee, H. G. Tulley will continue as president of International. Thomas Penney is the vice-president and general counsel, Edgar G. Dickson, vice-president in charge of operation, and C. A. Chavel, auditor. Carl A. Weber is appointed secretary and treasurer.

A careful and complete survey and analysis of the International system and service will be at once undertaken by Mitten Management experts under direction of President Tulley, in an endeavor to give to Buffalo the best possible railway service. To that end the suggestions and kindly co-operation of the car riders and the community is being solicited.

The International Traction Company is now a thing of the past. Its $5,000,000 of preferred stock and its $10,000,000 of common stock, issued at the time of the 1901 consolidation, have been completely wiped out. The stockholders of the underlying company, the International Railway, have been obliged to foreclose and take their property back.

Under the plan of reorganization now made effective, the International Railway stockholders were required to pay in new money. Nearly $4,000,000 was needed to put the International Railway in a position to pay its obligation and to relay worn out tracks so that the city paving of streets might be no longer delayed.

More than one-half of the entire issue of International Railway stock is now owned in the city of Buffalo and vicinity.

FORECLOSURE PREVENTED

In the annual report the company's operating revenue for the year ending Dec. 31, 1920, is given as $11,294,117. Operation and taxes amounted to $9,616,489, leaving an operating income of $1,587,628, which when added to the non-operating income, makes a gross income of $1,657,207. This gross income is entirely wiped out by interest, rentals and amortization of discount.

In setting forth the protective committee's reorganization plan in detail it is remarked that the initial responsibility confronting the committee was to prevent a receivership or foreclosure of the International Railway refunding and improvement 5 per cent mortgage in case of default. The committee made loans to the company amounting to $2,070,189. This debt was afterward cancelled by the committee. This act represented in effect a contribution of that amount to the company.

Permission to Sell Stock Refused by Cleveland Council

Permission to sell approximately $1,600,000 of Liberty Bonds held by the company is to be asked of the Cleveland City Council by the Cleveland Railway according to announcement made by officials of the railway and Fielder Sanders, City Street Railway Commissioner. The bonds are to be sold at current market prices and the loss on them is to be amortized out of the earnings.

If the City Council permits the sale of the Liberty Bonds, the money will be used to take up short time notes of the railway now held by Cleveland banks. These total almost $1,370,000. The proceeds of this loan have already been used in making extensions and improvements and all but $74,000 of the company's Liberty Bonds are pledged as collateral for the notes.

The company's request to sell its Liberty Bonds comes as a result of the City Council's refusal to permit the company to sell $3,000,000 par value of new stock at 80 and to amortize the discount from par out of earnings.

Opposition to the proposed sale of stock at 80 was led by the Cleveland *Press*. The paper insisted that the company should raise new capital through the sale of bonds. The company officials, however, are opposed to this and say that no extensions, improvements or betterments can now be made.

Receivers at Spartanburg

George B. Tripp and J. B. Lee have been appointed temporary receivers of the South Carolina Light, Power & Railways Company, owners of the Gaston Shoals power development in Cherokee County, the gas plant, the street railway line and electric lighting system of the city of Spartanburg, S. C. The appointment was made by Judge H. H. Watkins of the United States Court of the Western District of South Carolina. Mr. Tripp is vice-president and general manager of the company and Mr. Lee is president of the Bank of Commerce, Spartanburg.

The action of the court was in the case of the General Electric company, New York, complainant, against the South Carolina Light Power & Railways Company, defendant, in which it is alleged the company is indebted to the complainant in the sum of $13,358 the payment of which sum has been duly demanded but remains unpaid.

The court's order naming the receivers concludes by directing the parties to the case to appear on March 17 to show cause why the receivership should not be continued during the pendency of the suit.

$1,333,811 Reduction in P. R. T. Income

Deficit of Philadelphia Rapid Transit Under Five-Cent Fare Not All Made Up by Increased Fare

The serious financial condition that confronted the Philadelphia Rapid Transit Company when it actually increased fares in the latter part of 1920 is reflected in the report of the company for the year 1920. While merchandising methods did influence riders to some extent to pay double 5-cent fares instead of using transfers the gain in revenues was far from being sufficient to meet the rapidly accruing deficit.

ON NOV. 1 the basic fare was increased from 5 cents to 7 cents with no change in free transfer privileges or 3-cent exchange regulations. Reduced rate tickets were also established and sold four-for-a-quarter. During the last two months of the year revenues increased $1,304,002 even though traffic fell off 5,223,601 passengers over the corresponding period of the previous year.

The report reviews the endeavor of the company to add to its revenues from the time the Stotesbury-Mitten management took hold in 1910 to date. Among other things, attention is called to the average gain in per capita riding of 74 per cent in Philadelphia as against 27 per cent in Detroit, Cleveland, Buffalo and Chicago in that period. This gain is held to be attributable to short distance riding. By means of consistent educational methods, this has grown in 1920 to 180,000,000 passengers a year and represents more than $7,000,000 of added revenue.

As to industrial relations, the report points out that two changes in wages were made during the year, the last of which increased the maximum rate to 72½ cents an hour. This rate, however, although retroactive to June 1, 1920, did not actually become payable until Nov. 1, when the higher fares became effective. The back pay with interest was disbursed to all employees on Feb. 1. The basic rates for wages are the average of those paid to trainmen in Chicago, Detroit, Cleveland and Buffalo. Reduced wages in any of these four cities will automatically serve to reduce the wages paid in Philadelphia.

In speaking of the operation of the Frankford "L" for the city, the report states that this is made difficult because of the misinformation originally fed to the public as to the probable earning power of the extension. Even now, the Market Street subway-elevated, built in days of much lower prices and in operation since 1907, is just beginning to earn 6 per cent upon its actual cost. In the meantime real estate operators have benefited by this improvement and the assessed values on property in West Philadelphia have increased $113,000,000. It is said that the increased valuation of properties directly affected by the Market Street rapid transit line is as much as 98 per cent.

INCOME STATEMENT OF THE PHILADELPHIA RAPID TRANSIT COMPANY

Year ended Dec. 31	1920	1919	Per Cent Change
Gross passenger revenue	$37,989,623	$34,739,589	+9.36
Other operating revenue	817,731	618,882	+32.13
Total railway operating revenue	$38,807,354	$35,358,471	+9.75
Way and structures and equipment—Maintenance and renewals	$5,595,600	$4,707,012	+18.85
Power—maintenance and operation	3,728,027	3,450,486	+8.04
Conducting transportation	13,748,926	11,387,653	+20.78
General	3,521,359	2,697,091	+30.50
Total railway operating expenses	$26,593,912	$22,242,242	+19.55
Net operating revenue	12,213,442	13,116,229	—6.87
Taxes, including paving tax	$2,601,253	$2,345,750	+10.87
Operating income	$9,612,189	$10,770,479	—10.74
Non-operating income	$592,986	$681,049	—12.90
Gross income	10,205,175	11,451,528	—10.88
Interest	$976,463	$927,926	+5.24
Rentals	8,726,647	8,687,725	+0.45
Sinking fund—city contract	120,000	120,000	0.00
Total deductions	$9,823,110	$9,735,651	+0.90
Net corporate income	$382,065	$1,715,877	—77.90

STATISTICAL INFORMATION OF THE PHILADELPHIA RAPID TRANSIT COMPANY

	1920	1919	Per Cent Change
Average total miles operated	671.77	671.42	+0.05
Revenue car-miles to car-hours—speed in M.P.H.	9.33	9.07	+2.86
Revenue passengers at 5 cents	(c)	671,652,444	......
Revenue passengers at 7 cents	(c)	....	......
Total revenue passengers	704,557,608	671,652,444	+4.90
Revenue exchange passengers at 3 cents ( )	55,233,232	51,675,791	+6.88
Free transfer passengers (b)	154,079,623	149,427,164	+3.11
Total passengers handled	913,870,463	872,755,399	+4.71
Gross passenger revenue	$37,989,623	$34,739,589	+9.37
Average fare—per revenue passenger	5.40	5.18	+4.25
Average fare—per total passengers handled	4.15	3.98	+4.25
Revenue per mile of track	$56,550	$51,800	+9.17
Operating ratio—per cent	68.5	63.0	+5.50
Taxes, per cent of gross revenue	6.70	6.52	+0.18

(*a*) 536 points in 1919 and 537 in 1920. (*b*) 333 points in 1919 and 336 in 1920. (*c*) Not available.

With the increased cost of operation it is not now thought that the Frankford "L" can earn much, if anything, in excess of its operating cost. For that reason the company urges that new estimates be made as to the earning power of these lines operated independently and as an integral part of the Philadelphia Rapid Transit System.

The city is also urged to ask the Public Service Commission to participate in the conferences leading up to the execution of the Frankford "L" operating contract. This, if done, should insure against a repetition of the refusal to approve, which was the fate of the proposed 1918 city contract, and will offer opportunity for the consideration of such fare adjustments as may be necessary to assure the payment of the forementioned 5 per cent return.

The accompanying income statement for the past two years indicates that operating expenses have more than kept pace with any growth in gross revenue. In 1920, notwithstanding the increased fare during the last two months, the gain was far from being sufficient to wipe out the early losses of the year.

Statistical information compiled from various sources indicates that the losses in traffic due to the 7-cent fare have by no means been such as to wipe out entirely the normal increase for the year.

Capital Traction Favors Consolidation

George E. Hamilton, president of the Capital Traction Company, Washington, D. C., has set forth in a letter to a member of the district committee of the House the attitude of the company toward the proposed merger with the Washington Railway & Electric Company. Among the elements that Mr. Hamilton says should be taken into account in any such change are cited the following:

1. A merger should include the property of both companies, the lines within and without the District of Columbia, and the Potomac Electric Power Company.
2. The basis of merger should be the relative earning or exchange value of the companies.
3. A provision for service at cost, in order that the rate of fare might be automatically adjusted to conditions.
4. A management that would command the confidence of the public and the security holders, and in this management, as well as in the negotiations for merger, the public should have representation.
5. A plan of merger so worked out and approved by the Commissioners should be submitted to the stockholders of the respective companies for their consideration, and if approved by them reported back to the Commissioners.

Mr. Hamilton sums up the matter:

> Congress may have the power, but I doubt its right, through the imposition of excessive taxes and otherwise, to hamper and destroy these properties. It has the power to penalize through taxation, but I do not believe that Congress, in its wisdom, desires to so use its power. My belief is that Congress desires by legislation, helpful to the companies and protective to the public, to encourage and provide for a right conclusion and consolidation through a fair agreement of merger, and in this effort and direction it will have our cordial co-operation. My associates in the company and I are in favor of such a consummation, and if Congress would enact a law permitting a merger, I believe the wished-for consolidation could be brought about voluntarily in the near future by the parties in interest.

Financial News Notes

Interurban Decides to Quit.—The stockholders of the Morgantown (W. Va.) Interurban Railway have decided to discontinue business and surrender the company's charter.

Commission Appraising Kalamazoo Lines. — The Public Utilities Commission of Michigan is engaged in appraising the lines of the Michigan Railway in connection with the fare case now pending before the commission.

Cars Seized to Secure Payment of Fares.—Two cars of the New Paltz, Highland & Poughkeepsie Traction Company, New Paltz, N. Y., have been seized by the sheriff and advertised for sale for non-payment of taxes amounting to $1,500.

Interurban Declares Initial Dividend.—The Rochester & Syracuse Railway, Syracuse, N. Y., has declared an initial quarterly dividend of 1 per cent on the $2,500,000 non-cumulative preferred stock, payable on March 15 to stockholders of record March 1, 1921.

Tulsa Lines Plan to Consolidate.—The Tulsa (Okla.) Street Railway and the Oklahoma Union Railway, which also owns and operates at Tulsa, are negotiating for consolidation of the two systems. Details of the plan have not been announced, but it is known that it is planned that the Tulsa Street Railway will take over the city lines of the Oklahoma Union Railway, leaving the latter company to operate its interurban properties without the hindrance of the local lines.

Note Issue Quickly Subscribed.—Stone & Webster, Boston, Mass., announce that their Texas property, the Galveston-Houston Electric Company, has sold $250,000 of five-year 8 per cent notes. This issue was offered to employees and patrons of the company at par, and within one week was entirely taken up by this class of investors. The purpose of the issue is to complete needed trackage in the downtown district of Houston for the purpose of relieving traffic congestion.

Southern Pacific Plans Abandonment.—The Southern Pacific Company has informed the Railroad Commission that it proposes to abandon a material part of the electric service operating over the terminal property at Oakland, Cal. It is proposed to abandon the electric lines and service between the property along Webster Street to and across the drawbridge and over San Antonio estuary; to discontinue the operation of the so-called Fourteenth Street trains now operating between Alameda Mole and the Fourteenth Street terminal property, together with the operation of street cars which now run between Alameda and the depot.

Kansas City Must Act Quickly.—In a speech made recently in Kansas City, Mo., Francis M. Wilson, one of the receivers of the Kansas City (Mo.) Railways, said that only fourteen of the thirty-five lines of that company are paying the cost of operation. The outlying lines are making no money. He regards the forced sale of the properties to be inevitable, unless the revenues of the company are built up. If the receivers are unable to make any progress the court will be quick to realize that nothing more can be done. Under forced sale only the first mortgage bondholders would be likely to receive anything. The second mortgage bondholders and the stockholders would be wiped out. All claims now piled up and pending against the company, including those of the city, would also be unpaid. He asked his audience to contemplate such proceeding in its effect upon the city of Kansas.

Preferred Stock Sold to Employees and Customers. — The San Antonio (Tex.) Public Service Company has just placed on the market an issue of $2,000,000 of cumulative preferred stock yielding an annual return of 8 per cent. This stock is being sold to employees and customers and the selling is being done principally by the employees. At the end of the first month approximately $80,000 of this stock was sold. In order to give the customers the best information possible and the kind of service to which they are entitled an investment department has been organized. This department is in charge of S. J. Ballinger, commercial manager of the company. Just enough salesmen are kept in the investment department to take care of inquiries and assure the proper treatment. No effort is made to secure experienced stock salesmen. Company employees who are familiar with the business and know how to be polite and courteous to the public are used as special salesmen.

City to Appraise Utica Lines.—The city of Utica, N. Y., has retained three auditors of Milo R. Maltbie, public utility consultant, to appraise the Utica holdings of the New York State Railways in the fight of the municipality against an increased fare. The company placed a petition before the Common Council of the city some time ago asking for a fare increase on the grounds that the present fare was inadequate and was forcing them to operate at a loss. Following the city's refusal to consider the proposition the company curtailed service to a considerable extent. The corporation counsel of Utica procured an order from the Public Service Commission instructing the company to restore normal service. The company then filed a demand for a 10-cent fare with the commission. To date the railway and city officials have been patiently awaiting settlement by the commission. The engagement of the accounting experts by the city is the first local development in the tangle since negotiations began.

Traffic and Transportation

Director Stops Increase

Cincinnati Traction Company Prevented by City from Putting Nine-Cent Fare Into Effect

A temporary injunction issued by Judge Stanley Matthews, of the Common Pleas Court, on Feb. 24 prevented the Cincinnati (Ohio) Traction Company from increasing fares on its lines another half a cent to 9 cents on March 1. In the meantime fares will continue at 8½ cents.

Walter Draper, vice-president of the company, announced the increase on Feb. 16. W. C. Culkins, director of street railways, promptly announced that proceedings would be instituted to enjoin the fare increase. The company contends that a deficit exists. No definite date has been set for the hearing.

CITY CAN REFUTE CHARGES

The basis of the city's suit to enjoin the 9-cent fare was its claim that no deficit exists, according to the city's way of figuring. To this Alfred Cassett, attorney for the company, answered that the company resented the implication that it was not acting in good faith when it presented figures showing such a deficit to exist.

In rendering the injunction Judge Matthews said the company can ask for a dissolution of the temporary order whenever it is ready to offer evidence against the charges of the city, or the city solicitor can, whenever he desires, ask for a final hearing on his petition for a permanent injunction.

Indications are that in the meantime William C. Culkins will attempt to push negotiations for a reorganization of the company. He believes this will do away permanently with conditions that have necessitated fare increases in the past.

In his petition City Solicitor Zielonka charges:

> That the traction company has from time to time increased fares upon the "pretended claim that gross receipts have been insufficient."
>
> That if car fares were allowed to go to 9 cents the volume of passenger traffic would be reduced.
>
> That increased rates would not produce larger gross receipts.
>
> That there is no deficiency existing in December and January gross receipts.

In addition to the traction company the Cincinnati Street Railway and the Ohio Traction Company were named defendants in the suit. Mr. Zielonka asserted it was necessary to name all the companies because of this interrelation to one another.

Officials of the Cincinnati Traction Company insist a deficit of about $125,000 existed in receipts for December and January and that the total deficit in operating expenses is more than $665,000.

Commissioner Culkins contends $350,000 of the alleged deficiency is represented in a suit filed by the city to recover that amount from the Ohio Traction Company, the Cincinnati Car Company and the traction company. About $333,000 more is represented in over-expenditures by the company last year, Mr. Culkins says. The traction company exceeded its budget by that amount, he says and he refused to approve the expenditures.

Accidents Diminish with Experience

An interesting exposition of the influence of experience of trainmen on the accident record is afforded by the comparative statistics of the Kansas City (Mo.) Railways Company for December, 1920, and December, 1919. It will be recalled that in 1919 the company was going through the ordeal of building up a completely new transportation organization, made necessary by the strike in December, 1918. At the end of 1919 a large part of the force was still inexperienced, while by the end of 1920 the turn-over had been greatly reduced and the average amount of experience had substantially increased. The result is clearly reflected in the following accident figures for December:

	Vehicle Accidents	Railway Car Collisions	All Classes of Accidents	"Blind" Accidents
1919...	631	87	1,050	61
1920...	468	31	806	38
Decrease	163	56	244	23

Des Moines Losing on an Eight-Cent Fare

In spite of an 8-cent fare the Des Moines (Iowa) City Railway did not make as much money during January, 1921, as it did during January, 1920, when the 5-cent fare was in effect. According to the report of Scott Goodrell, the city supervisor, to the City Council, the deficit in January this year was $13,923, whereas in January, 1920, there was a nominal profit of $2,767. Costs incident to a 40 per cent increase in service which was made effective at the time the 8-cent fare was authorized are blamed for the loss as compared to the figures of a year ago. Mr. Goodrell is authority for the statement that the twenty buses now operating in Des Moines are responsible for a cut in income of the railway amounting to $21,000 a month. He estimates that each of the buses is carrying 700 passengers a day.

The application of the city to nullify the 8-cent fare is referred to on page 469.

Hearing on Jitney Regulation

Demand in Connecticut that Bus Be Restrained and Made Subject to Same Obligations as Trolley

The unregulated jitney bus has encountered an added opponent in Connecticut through the alliance of the Federation of Labor of that State with the railway interests in support of a bill now before the Legislature. At a hearing before the judiciary committee at Hartford on Feb. 15 Ira M. Ornburn, representing the federation, said that the bill was introduced at the request of the labor organization. He believed the motor vehicles had entered into unfair competition with the electric railways and argued that they should be subject to the same operating tax as the trolleys. He believed further that the buses should not be allowed to operate on streets where there were car lines.

J. T. L. Hubbard, Bridgeport, attorney for the Park City Bus Association, surprised the committee by stating that he himself favored regulation of the jitneys by the Public Utilities Commission. He picked flaws in the measure under consideration with such apparent success that the bill will undoubtedly be materially amended before it is reported by the committee. Mr. Hubbard stated that he had framed a bill also before the Legislature which provided for regulation of motor vehicles with certain restrictions and conditions. The bill before the committee Mr. Hubbard characterized as impracticable and impossible of operation.

L. S. Storrs, president of the Connecticut Company, was asked whether, if jitney competition were entirely stopped, the railway could pay its taxes to the State. He replied that he could not tell, but stated that if the jitneys were eliminated the direct revenue to the trolley would be from $750,000 to $1,000,000 more than at present.

C. S. Brody, Bridgeport, representing another association of jitney men, said the supporters of the bill evidently thought it more important to keep the Connecticut Company alive than to serve the public. The bill, he said, would eliminate jitneys and the people of Bridgeport didn't want them eliminated. He stated that the bus owners were willing to accept reasonable regulation and a reasonable tax.

Major J. Moss Ives, receiver of the Danbury & Bethel Street Railway, said the road was running behind $40,000 and $50,000 a year in operating expenses due to unfair jitney competition. The past two years the road has not been able to pay the $12,000 taxes due the state, which could have been paid had jitney competition been eliminated by the 1919 Legislature.

Shreveport Fare Case Appealed

Appeal has been taken to the Supreme Court of Louisiana by the Shreveport (La.) Traction Company of the case before Judge Hand where the court held that the referendum election of May 18 was illegal in which the voters authorized the company to increase fares from 5 cents to 6 cents until Dec. 31, 1923. The court ruled in substance that technical requirements of the law had not been met in submitting the measure and that the granting of a new fare charge or increase in rates was the granting of a new franchise. In the event that a retrial is denied an appeal will be taken to the Supreme Court.

The case against the company was brought by H. P. Long, Jr., a member of the Shreveport bar. He questioned the validity of both the ordinance and the election.

The request for an advance in fares had its origin in an appeal by the employees of the railway last spring for an increase in wages. The company was then paying motormen and conductors 33 to 43 cents an hour. The books of the company were opened to the men by the railway to prove that under the fare then in effect it would be impossible to grant the request for an advance in pay. The men then suggested to H. B. Hearn, president and general manager of the company, that he go before the people and ask their permission to increase fares. This Mr. Hearn did with the full approval and backing of his employees.

Nothing Constructive Done at New Orleans

At the instance of Paul H. Maloney, Commissioner of Public Utilities of the city of New Orleans, La., an audit made by A. C. Moffat, secretary of the Sewerage and Water Board of New Orleans, discloses that the service-at-cost plan advocated by Eastern bankers, assuming the valuation of the New Orleans Railway & Light Company to be $40,000,000, would necessitate a fare of 6.8 cents, just to pay operating expenses and a 6 per cent guarantee to investors.

The audit of the books of the company covered the period from Oct. 22, 1920, to Dec. 31, 1920. The 8-cent carfare went into effect on Oct. 22, 1920.

The valuation of $40,000,000 was used merely as an illustration and is not accepted by the city. The representatives of the company fixed the valuation at $55,000,000 and the Ballard report fixed the value at $35,000,000.

Mr. Moffat has been asked to make an audit through January.

The critical situation in which the New Orleans Railway & Light Company now finds itself impelled Judge Rufus Foster of the Federal District Court to call a conference on Feb. 25 in the federal court building. The purpose of the meeting was not disclosed in advance, but it was surmised that the probable rejection of the service-at-cost plan, advocated by the receiver and representatives of the security holders makes it imperative that some temporary settlement of the railway situation should be reached at once. The 8-cent fare ordinance will expire on April 1.

Routing and Other Changes Contemplated at Toledo

Drastic changes in routing and schedules of the lines of the Community Traction Company, Toledo, Ohio, the abandonment of some lines, and the regulation of jitney buses may be put into effect by the board of control. Before making any general recommendations, however, Wilfred E. Cann, Street Railway Commissioner, will probably await the report for the first month's operation under the Milner service-at-cost ordinance.

Checkers at work collecting data on the operation of the jitneys discovered one day recently that 9,414 persons rode that day on buses. The check was made on the Oak, Cherry, Dorr and a few other lines at busy points. Figuring the fares of these bus patrons at 6 cents the jitneys deprived the railway of at least $584 of revenue. On the basis of this and subsequent counts it has been estimated that the jitneys are depriving the railway of approximately $425,500 a year.

Commissioner Cann and Law Director James Martin have been working on an ordinance to regulate the motor traffic. The railway officials are not opposed to jitney competition on a fair basis and are not opposed to the operation of jitney lines which do not compete with the railway. They are hopeful that a form of auxiliary service may be worked out for the buses.

The names of the engineering and auditing assistants are given on page 471 of this issue.

Louisville Badgers Its Railway

It will probably be at least eight or ten weeks before the appeal of the city of Louisville, Ky., from the Federal injunction permitting the Louisville Railway to collect a 7-cent fare, can be decided by the Federal Court of Appeals at Cincinnati. In the meantime the City Council and some of the smaller publicity seeking attorneys are doing their utmost to harass the company. An instance of this is supplied in the suit filed against the company for recovery of 4 cents.

Another stab at the railway is an ordinance which seeks to remove all bars from jitney bus operations. The present ordinance provides a license of $50 for the first bus, and $10 for each additional. The new ordinance would put a flat rate of $10 license on the first and all other buses. It would also substitute a surety bond in place of the present real estate bond of $5,000.

City Attorney Lawton has been investigating the law to decide whether a mandamus proceeding could not be brought against Federal Judge Evans, at Louisville, to compel the company to issue receipts for all 7-cent fares so as to enable the public to collect overcharges in the event the upper courts hold with the city against the railway.

The City Council has set aside a fund of $25,000 to be used in defraying legal expenses in making its fight on the railway. Part of this will be used in investigating the assessable value of the company's property, with the plan of forcing payment of back taxes.

The county is also planning to double or triple the assessment of the company's property for taxation purposes.

Court Doesn't Propose Railway Shall Share Assets with Public

Federal Judge Robert E. Lewis on Feb. 16 granted the city of Denver, Col., permission to intervene in the Denver Tramway's petition for increased fares. The court entered an order making the city a party to the proceedings evolving from the petition filed by Ernest Stenger, receiver for the company, asking for a 10-cent fare. The city has ten days within which to file its answer to the petition. The case has been set for final hearing in the United States District Court, District of Colorado, on March 1.

Following an application by the city of Denver in which it sought to have the proceedings instituted by the receiver dismissed on the ground that the federal court has no jurisdiction in the matter, Judge Lewis ruled that the court has jurisdiction over the settlement and emphatically declared that relief of some kind was imperative to the company and that it would be granted, stating in part:

> This court has neither the power nor the disposition to continue a condition which will result in taking away from the stockholders of the tramway its property and distributing it among the public.
>
> There is no community in the country that wants public service furnished it on a charity basis. In fact even were this community willing to take service from the tramway upon such a basis, it would be discontinued for lack of assets.
>
> If the contentions of the petitioneer regarding the condition of the tramway is correct, and there is nothing before this court to show that such contentions are not correct, then relief of some sort is imperative, and this court proposes to see that it gets all the reasonable relief possible to give it.

Seven-Cent Fare Asked in Dallas

The Dallas (Texas) Railway, having been halted in its negotiations with the city of Dallas for a revision of its present franchise so as to embody the real service-at-cost features under which the company would be guaranteed a net return of 7 per cent on its invested capital, has renewed its request for a 7-cent fare. A statement is now being prepared by the company's officials for presentation to the City Commission setting forth in detail the financial conditions of the company and showing the urgent need for an increased fare.

In discussing the application, Richard Meriwether, vice-president and general manager, said that if the company were forced to go into the federal court and seek an increased fare on the ground that the present fare is confiscatory, an 8-cent fare will be asked.

J. F. Strickland, president of the company, and other officials who have been taking part in the new franchise negotiations have agreed to let these negotiations drop for the present, if the city will act on the increased fare question.

Bondholders Go on Strike

The Public Service Commission of Indiana will rule on the Lafayette Service Company's plea for increased fare within the next few weeks. Fred B. Johnson, commissioner, after listening to the evidence presented by the company at a public hearing in Lafayette recently, has taken the matter back to the commission for consideration.

The company presented financial statements for the seven months' period from May 1, 1920, to Nov. 30, 1920, in which it was shown several of its lines were operated at a loss. The company is asking to have the city fare increased from 5 cents to 6¼ cents with a 10-cent fare for a single ride if tickets are not bought. A 20 per cent increase in suburban fares also is asked.

Charles Niezer of Fort Wayne, attorney for the company, told Commissioner Johnson that unless the company received relief it would have to suspend operations. The tracks are in bad condition, and the bondholders, R. W. Levering, manager, testified, will allow the line to be junked before they will invest any more money under existing conditions. Jitneys, operating between the city and Purdue University, it is said, take more than $100 a day away from the railway.

Transportation News Notes

Seven-Cent Fare Refused.—The Public Service Commission of Pennsylvania has denied the application of the Warren Street Railway to increase its fare from 6 cents to 7 cents. The commission authorized the 6-cent fare in December, 1918.

Ten Cents Cash in Everett.—By a recent order of the Public Service Commission fares on the railway lines of the Everett Railway & Power Company, Everett, Wash., have been advanced from 5 cents to 6¼ cents on a token basis, with a 10-cent cash fare. The order became effective on Feb. 3.

Fare Rise in Mansfield.—The Richland Public Service Company operating in Mansfield, Ohio, has been granted a fare rise from 7 cents cash to 8 cents cash, with seven tickets for 50 cents. Recently the company petitioned the City Council for a 10-cent cash fare and six tickets for 50 cents. The old rate was 7 cents cash with four tickets for 25 cents.

Fare Rise Approved.—The Alabama Public Service Commission in a recent order has given permission to the Alabama Power Company to charge 7 cents on its lines in and between Attala, Alabama City and Gadsden despite the opposition of the City Councils of Gadsden and Attala. It is provided that tickets will be sold at the rate of 16 for $1. The company will be required to issue transfers on any one line to any other line.

Eight Cents in Findlay.—The Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, has accepted the service-at-cost grant passed by the Council of Findlay. March 17 has been set as the date for the new 8-cent fares to go into effect. At present the company is permitted to charge only a 5-cent fare. The new rate of fare will prevail for the first three months under the franchise.

Cultivation of Riders Planned.—The Tacoma Railway & Power Company, Tacoma, Wash., has announced that although six months' operation under the present 10-cent cash fare, with 8-cent tickets, shows the company is not making enough above operating expenses to pay interest on its indebtedness the company does not contemplate asking for an increase in fares. An effort will be made by the company to get more persons to ride in cars.

Five-Cent Fare Ordered Restored.—Judge J. C. Hutchison, sitting in the United States court for the Southern District of Texas, at Houston, has handed down an opinion refusing to enjoin the city of Galveston from enforcing an ordinance directing the Galveston Electric Company to discontinue collection of 6 cents from railway patrons and to collect the old fare of 5 cents. The ruling will be reviewed at length in an early issue of the ELECTRIC RAILWAY JOURNAL.

Increased Rate in Guelph.—The Private Bills Committee of the Ontario Legislature has approved an increase in fares on the Guelph Street Railway from 5 to 7 cents, with four tickets for 25 cents. The city solicitor of Guelph informed the committee that the railway, which is operated by the municipality, had a deficit of $13,000 last year and $11,000 in 1919, and that the Hydro Electric Power Commission of Ontario had advised increased fares as the only means of overcoming the deficits.

Des Moines Case Heard by Full Court.—The application of the city of Des Moines, Iowa, for a writ in supersedeas to nullify the 8-cent fare ordered allowed by Judge Martin J. Wade a few weeks ago, will be heard on March 4 at Kansas City by a full bench of the United States Circuit Court of Appeals. The hearing was originally set for Feb. 25, but was postponed. Efforts of the attorneys for the city will be to return to the 6-cent fare pending a hearing upon the merits of the 8-cent needs.

Schenectady Fares Increased.—The Public Service Commission for the Second District has authorized the Schenectady Railway to discontinue the sale of commutation, round trip and other special rate tickets on its different divisions. The order provides that the company may charge $5 for a fifty-four-trip book covering the ride between Schenectady and Albany and with the city fares of 7 cents in each city the rate is $12.56 against the present rate of $10.40. The company in its application asked for $13.50. The new rate on the Troy line, where there was a charge of $10.40, will be $13.50.

Higher Fares Granted in Sherbrooke.—The application of the Sherbrooke Railway & Power Company, Sherbrooke, Que., for increased fares has been granted by the Public Utilities Commission of Quebec, Canada. The new rates went into effect on Feb. 1, and are as follows: Adults, cash fare, 10 cents, or six tickets for 50 cents; children, cash fare 4 cents, or eight tickets for 25 cents. After midnight, 15 cents cash will be the fare for each passenger. Transfers are provided without extra charge. Under the old schedule the cash fare was 8 cents, or four tickets for 25 cents.

Six Cents in Elmira. — The Public Service Commission has granted permission to the Elmira Water, Light & Railroad Company, Elmira, N. Y., to advance its rates on lines within city limits to 6 cents; Rorick's Glen, Elmira Heights and other points outside the city will be 7 cents; to Horseheads the fare will be 13 cents. The new rates went into effect Jan. 30, 1921. Superintendent Maloney commenting on the commission's decision has said that the company will really be no better off than it was a year ago with the 5-cent fare due to the change in conditions and the falling off in traffic.

Three Cents a Mile in Pontiac.—The Bloomington, Pontiac & Joliet Electric Railway has put into effect a straight 3-cents-a-mile fare on its lines in Pontiac. Last June the Illinois Public Utilities Commission granted the company permission to increase its fares to 3 cents, but another ruling of the commission provided that when tickets were purchased the fare would be 2½ cents a mile, while cash fare paid on the cars would be at the rate of 3 cents a mile. Since the steam roads are charging 3.6 cents a mile the Bloomington, Pontiac & Joliet Electric Railway petitioned the commission for permission to charge 3 cents a mile regardless of ticket sales or cash fares. The new ruling became effective Feb. 1.

Seven Cents Authorized in Clinton.—Under a recent ruling of Judge A. P. Barker, the Clinton (Iowa) Street Railway has been authorized to charge a 7-cent cash fare with four tickets for 25 cents. The company was collecting 6 cents and had petitioned for 8 cents. The fare controversy in Clinton dates back several months when the railway raised its cash fare from 5 to 6 cents to meet the demands of its employees who were seeking an increase in wages. Prior to this the City Council of Clinton had refused the petition of the railway for authority to raise its fare to 7 cents. An appraisal of the railway's property followed and the opinion of Judge Barker permitting the 7-cent fare is based on this appraisal. The new rates in Clinton went into effect on Feb. 20.

Personal Mention

Mr. Seeligsberg, Manager

L. W. Seeligsberg, executive assistant McGraw-Hill Company, has been appointed business manager of the ELECTRIC RAILWAY JOURNAL. In this position he succeeds J. E. Mason, who has been appointed business manager of *Power*, one of the McGraw-Hill publications.

Mr. Seeligsberg, who is a graduate mechanical engineer of Stevens Institute of Technology, and is an associate member of the American Society of Mechanical Engineers, is well acquainted with the electric railway field, having been business manager of this paper in 1918 and 1919. He resigned this office during 1919 to become manager of the circulation department of the McGraw-Hill Company, and later was appointed executive assistant to the president and vice-president of the company.

Mr. Seeligsberg has had an extended experience in the business affairs of technical papers, having been at one time business manager of *Engineering Record* and also for a number of years manager of the service department of the McGraw-Hill Company. He comes to his present position therefore well qualified to carry out its duties.

F. R. Devlin Elected President

Frank R. Devlin has recently been elected president of the State of California Railroad Commission, the position held in past years by the late John M. Eshleman, Max Thelen, now of the Interstate Commerce Commission and E. O. Edgerton. The post has been vacant since Mr. Edgerton's term expired.

Mr. Devlin was appointed to the Railroad Commission by Governor Johnson, taking office January 3, 1915, and filling the vacancy caused when Mr. Eshleman took office as lieutenant governor.

During Mr. Devlin's six years of service on the Railroad Commission he has presided over some of the most important cases in the history of American rate regulation. He has tended to specialize in power and hydro-electric matters, and his decisions in such matters as the Pacific Gas & Electric rate and finance cases laid down the lines upon which will proceed the future power development of California.

Equality of payment among purchasers of service has been one of his outstanding economic policies. In 1918, with Commissioner Edgerton, he sat in the now famous Pacific Gas & Electric surcharge case, out of which developed the decision that corporations must abrogate contracts giving special rates to certain consumers. Many of these contracts were of long standing. Mr. Devlin took the position that to favor one consumer is merely to penalize all the rest, and that contracts of this sort were of the same illegal standing as rebating.

Mr. Devlin is 53 years of age. He resides in Berkeley, Cal.

Mr. Blinn Heads C. E. R. A.

Operating Head of Akron's Railways Foresees Successful Year for Central Association

Alfred C. Blinn, vice-president and general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, was elected president of the Central Electric Railway Association at the annual meeting in Toledo on Feb. 25.

In accepting the office of president of the association, Mr. Blinn expressed pleasure at the opportunity to serve that body. He said it had been his misfortune during the past year, on account of the franchise negotiations and other difficult matters with which his company had been confronted, to be unable to attend the meetings of the association. In listening to the discussion which had taken place earlier in the meeting in regard to the future of the association, Mr. Blinn attributed the apparent lack of interest and enthusiasm in some of the meetings during the last two years to the fact that most of the railway men have been so absorbed in their own company affairs that they have let association matters go.

A. C. BLINN

Looking ahead, Mr. Blinn expressed the hope that an enthusiastic spirit in the association work would prevail this year, for he questioned whether there ever was a time when railway men needed more than now the sympathetic understanding and the personal association which its conferences bring. He declared that while many companies have had their backs to the wall, so to speak, the situation is going to be worked out somehow because the industry had been proved to be essential. "We are selling a service that the public has got to have, and some time the people are going to realize that they must protect the utility companies as well as control them," he said. He hoped to see the electric railways nationalized, in the sense that they would become so stable a business that their securities would be absorbed by the investing public as are government bonds.

Mr. Blinn is a native of Ohio, having been born at Piqua in 1876. His connection with the public utility field began in the electrical department of the Sandusky (Ohio) Gas & Electric Company, of which department he later became superintendent and then general manager of the entire company. In 1904 he went to Macon, Ga., as general manager of the gas light and water company there, remaining for about five years. He was then made vice-president and general manager of the Public Utilities Company, Evansville, Ind. In 1917, following the purchase of the Northern Ohio Traction & Light Company by the Hodenpyl-Hardy interests, Mr. Blinn went to Akron to take the position which he still holds.

New Commissioner in Oklahoma

E. R. Hughes was recently elected a member of the Oklahoma State Corporation Commission. Mr. Hughes was for several years United States Commissioner at Elk City, Okla. He has for years been a close student of conditions in Oklahoma and has shown himself to be a man of courage and sound judgment. As a member of the corporation commission, Mr. Hughes will substantially dignify the administration of that institution, and can be depended upon so to conduct himself that credit will be reflected upon the state.

At a meeting of the members of the commission held recently, Campbell Russell was unanimously elected chairman of the State Corporation Commission, to succeed Art Walker, chairman for the past year and a half.

Motorman Made Labor Head

George B. Arnold, motorman on the Chicago & Oak Park Elevated Railroad, Chicago, was recently appointed chief of the Department of Labor of Illinois by Governor Small. Mr. Arnold has been in the service of the elevated railroads since 1897, and during this long period has endeared himself to his fellow employees as well as to the operating officials by his genial manner and strict attention to duty. For several years he has been prominent in the affairs of the local division of the Amalgamated Association. He has also been a member of the Chicago Board of Education for the past four years. Mr. Arnold was born in Troy, N. Y., in 1866.

Veterans to Operate Toledo Railways

A. Swartz Appointed Vice-President and Superintendent of Transportation—J. M. Enright in Charge of Roadway and Equipment

Two able traction men, Albert Swartz and Joseph M. Enright of the old Toledo Railways & Light Company, will have largely in their hands the operation of the Toledo street railway system under the Milner service-at-cost plan which became effective Feb. 1, 1921. Both are thoroughly acquainted with the problems of city transportation and especially familiar with existing conditions in Toledo. In the Community Traction Company, formed under the new plan to operate the traction properties of the Toledo Railways & Light Company, Mr. Swartz holds the offices of vice-president and superintendent of transportation and Mr. Enright is superintendent of roadway and equipment.

ALBERT SWARTZ is a Toledo boy who started his engineering career in railways back in 1895 when, as a graduate of Toledo Central High School, he took a position as chainman with the Ann Arbor Railroad at Toledo. His engineering work took him from that road to the old Lake Shore & Michigan Southern Railroad, now a part of the New York Central system. A few years later, as construction and maintenance engineer for the Baltimore & Ohio Railroad, he had a large part in the planning of the Washington Terminal. From Washington he went to New York as chief draftsman for the Erie Railroad and later was appointed division engineer at Huntington, Ind.

A. SWARTZ

After these seventeen years of railroad experience Mr. Swartz came to Toledo as an engineer in charge of the maintenance of way of the Toledo Railways & Light Company, and he has been connected directly with Doherty properties in that city ever since. In the fall of 1913 he was made vice-president of the Toledo & Western Railroad and served in that capacity with the interurban line until Jan. 1, 1917, when he came back to the city system as assistant manager of railways and in charge of maintenance and transportation.

Mr. Swartz is 43 years old now and is entering upon his new duties with the same system as vice-president and superintendent of transportation of the Community Traction Company. He has direct charge of operation of the cars and handling all employees in the operating end of the business.

Mr. Swartz belongs to the American Railway Association, the American Electric Railway Association, the American Association of Engineers and the Central Electric Railway Association.

Joseph M. Enright has grown up with the Toledo street railway system. Thirty-three years ago he accepted a position as the driver of a horse-car on the old Erie-Nebraska line and made his start in the business of transporting persons from one part of Toledo to another. Within the first three years of his service on the horse-car lines he became a conductor and then graduated to the motorman's place on one of the first electric cars in Toledo in 1889. He served as barn foreman at the old car barn on Erie Street near Ash Street for two years. Promotion to division superintendent at the powerhouse and barns at Monroe and Water Streets followed and he served in this capacity for eleven years.

In 1902 he went out to Perrysburg for a three-year stay as superintendent of the Maumee, Perrysburg & Waterville line, which is now a part of the Maumee Valley lines. Then he came back to Toledo and became superintendent of transportation of the Toledo Railways & Light Company, and when promoted to manager of railways served in that capacity for ten years. At the end of this term Mr. Enright had been thirty-three years in railway service in this community.

During the formation of the Community Traction Company, to put into operation the Milner service-at-cost plan, Mr. Enright was made temporary president of the company. He is now superintendent of roadways and equipment and has direct charge of maintenance, betterments, the administration of repair shops, carhouses and all equipment of the company.

Outside of electric railways he is most interested in motor boats. He is a member of the Maumee River Yacht Club and the Toledo Yacht Club. He is a member of the Central Electric Railway Association and also of the Toledo chapter of the Doherty Fraternity. Mr. Enright is 53 years old.

E. L. Graumlich has been named engineering assistant to Commissioner Wilfred E. Cann of the Toledo street railway system. He has for two years been in charge of schedules and service in the office of street railway commissioner at Cleveland. Mr. Graumlich was graduated as a civil engineer from the Case School of Applied Science, Cleveland, Ohio, and served through the late war as a second lieutenant in the Coast Artillery Corps. He has had two years' experience with the firm of Barclay, Parsons & Klapp on traffic studies and rapid transit work in Cleveland and vicinity and has had also five years' experience as a traction engineer.

H. Bailey-Stokes has been appointed accounting assistant to Mr. Cann. He is an engineer, a veteran of two wars, and also an expert in street railway accounting. He has been associated for two years with the accounting firm of Price, Waterhouse & Company, Detroit, Mich.

He was born in San Francisco and educated in England as a mining engineer. His first work was in the diamond mines of South Africa. At the outbreak of the Boer War he enlisted and served throughout the war. He returned to San Francisco and engaged in the practice of accounting after the close of the war. He also served in the World War until wounded, then spending the following two years on accounting work for the British government ship repair works in the city of Glasgow, Scotland.

J. M. ENRIGHT

Mr. Goodwin Joins Staff of Electrical Society

William L. Goodwin, well known in the electrical field for his ability to organize and secure co-operation from the various interests engaged in manufacturing and merchandising, has joined the staff of the Society for Electrical Development in the capacity of assistant to the president. Mr. Goodwin and James M. Wakeman, general manager of the society, will direct the activities of the society co-ordinately, under the authority of the president, executive committee and board of directors. Mr. Goodwin was one of the principal speakers at the December meeting of the Central Electric Railway Association in Indianapolis.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES   BUSINESS ANNOUNCEMENTS

Heavy Rolling Stock Loss in Recent Fires

Eighty-Four Cars Burned, with Total Damage of $1,000,000 in First Two Months of Year

With the advent of winter and the additional fire hazards to electric railways entailed thereby an increase in the number of disastrous rolling stock fires may usually be expected. The present year to date apparently presents no exception to this rule. Since the first of the year five fires which caused a loss of $50,000 or more each have been reported in these columns. The entire damage in these instances amounted to almost one million dollars while the number of cars destroyed totaled eighty-four. There were, of course, other fires of lesser importance reported, and undoubtedly some which did not come to the attention of the ELECTRIC RAILWAY JOURNAL. For general purposes, however, these five are sufficient to illustrate the tremendous economic loss which fires cause traction companies and the great need which exists for taking precautionary measures.

All five of the blazes noted occurred in carhouses, and in the three most damaging fires the flames are said to have originated in cars standing in the carhouse. In the other two instances the cause of the fire is unknown. In this connection attention might be called to the ordinance existing in many municipalities that cars must be heated before leaving the carhouse. The frequent practice of leaving cars unattended before they leave the carhouse while the pole is on the trolley wire and the heater and lighting switches are turned on has undoubtedly given many fires their start.

MOST FIRES START IN CARS

In fact, an examination of the fire records of a company which investigates and reports on public utility fires shows that the majority of fires on electric railway properties originate in the rolling stock itself, and with few exceptions the underlying causes are found to be mechanical defects which are encompassed for the most part by defective wiring, overheated resistance, short circuit and broken trolley wire.

During the year 1920 there were approximately twenty-six fires noted in these pages. In four instances the amount of the damage is unknown, but the total loss caused by the twenty-two other fires amounted to $2,225,000. Included in this figure was the value of 313 cars of various types that were entirely destroyed, though it is true that much of the rolling stock burned was old and considerably depreciated in value. Nevertheless, this total, which represents about 9 per cent of all the cars purchased throughout the country last year, represents not only an appalling monetary loss but also a decided setback to service.

Cotton Waste Prices Somewhat Easier

Slightly lower prices are being quoted on cotton waste than were given a month ago. The lowest range on white cotton is around 9 and 10 cents, while the top is from 12½ to 14 cents. For colored cotton waste 7 and 8 cents is given as a low figure and 10 and 11 cents a pound in 100-lb. lots as a top figure. Spot cotton in New York at this writing is 11.20 cents a pound. Buying in the traction field is quiet and in small amounts. With the light demands from railroads and the automotive industry the market shows little activity and supplies are ample to meet quick deliveries. Easing up in freight movement and a car surplus of about 370,000 freight cars is one reason for the curtailed buying. Mill supply of thread waste is beginning to build up.

No Blanket Action Against Price Guaranteeing

The Federal Trade Commission on Feb. 15 announced that it intends no blanket action against the practice of guaranteeing against price decline, but will consider each complaint upon the facts shown in the specific case. Any blanket order would have had considerable effect on many electrical manufacturers. The announcement says:

"The commission received so many complaints about the practice of manufacturers in guaranteeing commodities in the hands of wholesalers against decline in price that an extensive inquiry was made, resulting in expressions from more than 350 manufacturing and selling concerns, including trade associations whose represented membership must be more than double the number of individual statements. From the scope of the inquiry and the number and variety of replies, the result shown must be taken to be fairly representative of the difference in business opinion on this subject.

"The Federal Trade Commission, therefore, will consider each case of complaint of this character upon the facts shown in the specific case, applying the legal tests thereto. This action involves neither approval nor disapproval of the economic soundness of the arguments advanced before the commission for and against this practice."

Unfavorable Outlook for Early Steel Revival

Demands Necessitated by Wear and Tear Alone Only Slightly Under Present Rate of Mill Operation

Steel and iron, two of the fundamental factors in this nation's industry, were discussed before the editorial conference in New York on Feb. 18 by A. I. Findley, editor of *Iron Age*. In his address Mr. Findley said in part:

"What is certain is that the steel trade is today in a depressed state and that those who in November looked for a moderate revival in the spring of 1921 are now setting the date for any marked improvement some months further on in the year. There is a growing belief that present conditions in the United States are due more than we were willing to believe last year to the financial and industrial straits of Europe. As never before leaders in industry and finance in this country see that we are linked up with the rest of the world for better or worse.

STEEL A CRITERION OF BUSINESS

"In view of its basic character developments in the steel trade are important as an index to what is to be expected in 1921. Today there is about two-thirds operation of iron and steel works, with the possibility that with the coming of spring a temporary spurt in demand may bring the percentage up to 75. It has been found in other times of depression that wear and tear alone is good for about a 60 per cent operation in iron and steel.

"The outlook for an early and extensive revival of demand for iron and steel is not favorable. The fall in prices of agricultural products, which already represents a loss of $4,000,000,000 to the farming community, has reduced very much the demand for agricultural improvements. The railroads, which in average times take from 20 to 25 per cent of the steel output, are buying little. Rails and track accessories have been in best demand in the forms of steel which go to railroads. Until the railroads are freed from the stranglehold of the wasteful labor scheme imposed on them by the government they will not be free buyers of equipment. Today they have many idle cars with no early prospect of full use of their equipment.

"That the country is much underbuilt has been said over and over in the past two years. The automobile building program for 1921 can hardly be more than 40 per cent of that for 1920. The automobile industry has probably not taken more than 5 or 6 per cent of the country's steel output on the average, but its ramifications into various metal-working and machinery lines are such that it has been a very important sustaining factor. Shipbuilding demand for steel in 1921 is likely to be considerably less than in 1920. Mining, whether of coal, iron or non-ferrous minerals, will be restricted in 1921. So far as iron, copper and other metals are concerned operations of the mines can hardly go beyond 60 or 70 per cent of last year.

"The most favorable indication industrially for the present year is the evidence of a return to economic production methods. It will be a good thing for producers to learn again how to sell their products."

Tie Prices Shaded to Buyer Who Shopped

The course of action of a good-sized Middle Western traction company which was recently in the market for 4,000 railroad ties affords an interesting example of the present tendency of buyers to shop when prices are considered too high. The company in question was quoted a price of $1.60 for the best grade standard white oak ties, delivered. The management deemed this price too high and sent an agent scouting around for a couple of weeks to look over the market. This man came back with the information that ties were plentiful and railroads were not buying to any extent. Furthermore, as a result of his trip a quotation of $1.05 was obtained from a commercial tie producer for the same quality white oak ties, delivered. Second-grade white oak ties were offered at a price of 80 cents each. The company bought 4,000 ties at the latter price and they were shipped immediately from stock.

Trolley Poles Reduced in Price

Two Manufacturers Drop Quotations 20 per Cent—Demand Is Light and Deliveries Are Good

Price reductions on seamless-steel trolley poles have been put into effect by at least two manufacturers recently. The reduction in each case was a general cut of 20 per cent, effective Feb. 23 in one instance and Feb. 26 in the other. Two other manufacturers of trolley poles state that their prices remain unchanged. Steel prices are lower, but the cost of labor is said to be the limiting factor there.

The present market is quiet as buying of this product has been light for some time. It is hoped that following this price decrease and with the approach of spring sales will increase.

Stocks of trolley poles that producers are carrying just now are not large, but deliveries are entirely favorable. One or two manufacturers complain of raw material shipments and state that owing to the continued strong demand for tubular steel products the supply of trolley poles has been somewhat curtailed in the past. This condition is more than balanced, however, by the low volume of orders.

Equipment Manufacturers Unite to Finance Sales

Electric Railway Equipment Securities Corporation has just been formed by the J. G. Brill Company, General Electric Company and Westinghouse Electric & Manufacturing Company, with a capital of $1,000,000. The directors are Samuel M. Curwen, Henry C. Esling, W. H. Huelings, Anson W. Burchard, J. R. Lovejoy, O. D. Young, Guy E. Tripp, H. H. Westinghouse and H. B. Schute.

The activities of the new corporation will be confined strictly to the financing of the sale of street railway equipment, and it is understood its formation does not signify any connection between the three manufacturing companies represented other than providing the means of early payment for their product.

Track and Roadway

Public Utilities Company, Evansville, Ind.—A petition asking that the street car service in Evansville, Ind., be extended through Howell, a suburb, is being circulated by people living in Howell and will be presented to the Evansville Public Utilities Company, operating the car lines in Evansville. It is proposed that the cars run on Broadway and several other streets in Howell. At the present time the cars only run to Barker Avenue and Broadway where they turn. It is the contention of the patrons that the public would receive better service in the event that the lines were extended. Many persons are required to walk fully a mile to their homes after they leave the cars, it is pointed out. Superintendent Gerringher, of the street railway department of the Public Utilities Company, has promised to repair the street between the car tracks on West Franklin Street at Evansville as soon as the weather will permit. The city board of public works has received complaints that the brick paving, especially at crossings, was in bad condition.

Dallas (Tex.) Railway.—Work has been resumed by the Dallas Railway in laying steel on Masten Street which

NEW YORK METAL MARKET PRICES

	Feb. 3, 1921	Mar. 2, 1921
Copper ingots, cents per lb	12.75	12.50
Copper wire base, cents per lb	15.75	15.25
Lead, cents per lb	4.75	4.00
Nickel, cents per lb	43.00	41.00
Zinc, cents per lb	5.50	5.10
Tin, cents per lb	32.25	29.37
Aluminum, 98 to 99 per cent, cents per lb	28.00	28.00

OLD METAL PRICES—NEW YORK

	Feb. 3, 1921	Mar 2, 1921
Heavy copper, cents per lb	11.00 to 11.25	10.25 to 10.50
Light copper, cents per lb	8.50 to 8.75	8.00 to 8.25
Heavy brass, cents per lb	6.00 to 6.50	6.00 to 6.50
Zinc, old scrap, cents per lb	3.00 to 3.25	3.00 to 3.12
Yellow brass, cents per lb	4.00 to 4.50	4.00 to 4.25
Lead, heavy, cents per lb	4.00 to 4.25	3.25 to 3.50
Steel car axles, Chicago, per net ton	16.50 to 17.00	16.50 to 17.00
Old car wheels, Chicago, per gross ton	21.00 to 22.00	18.00 to 18.50
Steel rails (short) Chicago, per gross ton	16.00 to 17.00	15.50 to 16.00
Steel rails (rerolling), Chicago, gross ton	16.00 to 17.00	15.00 to 15.50
Machine shop turnings, Chicago, net ton	7.00 to 7.50	6.50 to 7.00

ELECTRIC RAILWAY MATERIAL PRICES

	Feb. 3, 1921	Mar. 2, 1921
Rubber-covered wire base, New York, cents per lb	18.00	16.50
Weatherproof wire base, New York, cents per lb	18.00	17.50
Standard Bessemer Steel Rails, per gross ton	45.00	45.00
Standard open hearth rails, per gross ton	47.00	47.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	.....	.....
Rails, girder (grooved), per gross ton, f.o.b. mill	.....	.....
Wire nails, Pittsburgh, cents per lb	3.25	3.10 to 3.25
Railroad spikes, drive, Pittsburgh base, cents per lb	3.65 to 4.00	3.65
Tie plates (flat type), cents per lb	2.75	2.75
Tie plates (brace type), cents per lb	2.75	2.75
Tie rods, Pittsburgh base, cents per lb	6.00	6.00
Fish plates, cents per lb	2.75	2.75
Angle bars, cents per lb	2.75	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb	5.50	5.50
Steel bars, Pittsburgh, cents per lb	2.35	2.00 to 2.35
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.20	3.85 to 4.20
Sheet iron, galvanised (24 gage), Pittsburgh, cents per lb	5.25	4.80 to 5.25
Galvanised barbed wire, Pittsburgh, cents per lb	4.10	3.85 to 4.10

	Feb. 3, 1921	Mar. 2, 1921
Galvanised wire, ordinary, Pittsburgh, cents per lb	3.95	3.70 to 3.95
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes, A quality), New York, discount	79%	79%
Waste, wool, cents per lb	11 to 17	11 to 17
Waste, cotton (100 lb. bale), cents per lb.		
White	10.50 to 14.00	9.00 to 14.00
Colored	7.50 to 12.00	7.00 to 11.00
Asphalt, hot (150 tons minimum), per ton delivered	40.00	40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	36.00	36.00
Asphalt, filler, per ton	36.00	36.00
Cement, New York, per bbl	4.10	4.10
Linseed oil (raw, 5 bbl. lots), New York, per gal	.77	.72 to .73
Linseed oil (boiled, 5 bbl. lots), New York, per gal	.79	.74 to .75
White lead (100 lb. keg), New York, cents per lb	.13	.13
Turpentine (bbl. lots), New York, per gal.	.70	57 to .59

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* These prices are f.o.b. works, with boxing charges extra.

will connect McKinney Avenue with the business district near Ervay and permit the cars now being operated in North Dallas to save fully one mile in making their cross-town trips. Under the present arrangement these cars are routed down McKinney Avenue to Lamar and then traverse the entire business district. Under the new routing made possible by the Masten Street line these cars can be routed into and across the retail district near Ervay. The work of laying steel on Masten has been held up for some weeks on account of paving and other street work, but this has now advanced to a point where the track work can go forward. The work is expected to be completed in sixty days.

Willapa Electric Company, Raymond, Wash.—Public Service Commission of the State of Washington has ordered the Willapa Electric Company to construct and maintain an extension of its railway tracks in South Bend along and on Water Street extended from the present terminus at the west end of Water Street to the office building and store of the Lewis Mills & Timber Company. The decision of the commission was unanimous.

Tacoma Railway & Power Company, Tacoma Wash.—Since the Tacoma Railway & Power Company plans the expenditure of $50,000 to $60,000 during the year in the repair of pavements along its tracks in the city the company has decided to refuse to haul heavy steam railway freight cars on all lines west of Commerce Street.

Brantford (Ont.) Municipal Railway.—The Brantford Municipal Railway expects within the next month to build two miles of track and one mile of overhead work.

Trade Notes

Dwight P. Robinson & Company, Inc., New York City, has recently opened branch offices in Montreal, Canada, in the Dominion Express Building. Alexander C. Barker, vice-president, is in charge of the office.

The Palmer Bee Company, Cameron Avenue and East Grand Boulevard, Detroit, is preparing plans for a four-story factory on Poland Avenue, to cost, including machinery, in excess of $350,000. The company manufactures elevating and conveying machinery.

The Midvale Steel & Ordnance Company, Philadelphia, Pa., earned net profits of $12,371,298 in the year 1920, according to the company's quarterly report. This is equivalent to $6.18 per share, compared with $10,387,418 net profits or $5.19 per share in 1919.

William C. Wilson, formerly with Taylor-Wharton Iron & Steel Company and William Wharton, Jr., Company as manager of sales, northeastern territory, has become associated with the Pittsburgh Screw & Bolt Company and will be located at its New York office, 50 East Forty-second Street.

The Clifton Manufacturing Company, Boston, has moved into offices in the new addition recently made to its plant at 63 Brookside Avenue. The portion of the old building made vacant by this change will be used for factory purposes. The company manufactures enamel and galvanized-steel conduits, insulating tapes and compounds and specialized rubber goods.

The Conveyors Corporation of America, Chicago, announces that S. D. Inman has been placed in charge of the engineering and design of its American trolley carrier and monorail conveying equipment for handling coal, ashes, sand, gravel, etc. Mr. Inman has been associated with the company in an engineering capacity for over a year.

The Tubular Woven Fabric Company, Pawtucket, R. I., has removed its New York office from 61 Broadway to 52 Vanderbilt Avenue. This change was made necessary because of the sale of "Duraduct" and "Duracord" having been combined under one sales organization. P. S. Klees has been engaged to take care of the combined sales in that territory.

George J. Blanton, who for the past four years has been connected with the engineering sales department of Chain Belt Company, Milwaukee, has been made New York district manager. Mr. Blanton has figured prominently in the largest installation of traveling water screens yet on record. Before joining the company he was with the General Electric Company for eight years. He is a graduate of the University of Michigan department of mechanical and electrical engineering class of 1909.

The Concrete Mixer Association of the United States, at its annual election of officers, held in Chicago, Jan. 28, elected Clifford F. Messinger of the Chain Belt Company, Milwaukee, president; W. B. Knickerbocker of the Knickerbocker Company, Jackson, Mich., was elected vice-president; A. T. Scannell of the Archer Iron Works, Chicago, Ill., treasurer, and H. E. Smith, president of the T. L. Smith Company, Milwaukee, Wis., chairman of the executive committee.

Peru Invites Exhibits of American Manufacturers at Centennial. — The Peruvian government will this year celebrate the centennial of its independence and has voted a sum equivalent to about $3,000,000 for this purpose. According to the Consul-General of Peru at New York, it has been arranged to hold an exhibit, probably in Lima, of manufactures of other countries. Concessions have been granted to the Peruvian Centennial Exhibits Company, 42 Broadway, New York City, and A. Ameraldi, Lima, Peru, from whom information as to allocations of space and rental charges can be obtained.

The Toledo Crane Company, Bucyrus, Ohio, successor to the Toledo Bridge & Crane Company, Toledo, manufacturer of "Toledo Cranes," has been chartered under the laws of Ohio. The company is now constructing and expects to have completed by March 15 a building, 120 ft. x 320 ft., to be used for erecting and assembly purposes; machine shop, 60 ft. x 300 ft.; structural shop, 90 ft. x 300 ft.; pattern shop, 60 ft. x 140 ft., all equipped with modern tools and arranged for continuous production, which will enable it to maintain former standards of quality and service established for "Toledo" cranes. The main office of the company will be at Bucyrus, with sales offices in New York City, Boston, Philadelphia, Pittsburgh, Buffalo, Cleveland, Cincinnati, Chicago, St. Louis, Kansas City, Seattle, Salt Lake City, San Francisco, Birmingham and Minneapolis. C. F. Michael is president and W. F. Billingsley is vice-president and general manager.

New Advertising Literature

Separators. — The Griscom-Russell Company, 90 West Street, New York City, is distributing a form sheet describing the new Stratton separator for power plants.

Angle Fittings, Water Heaters and Rotometers.—The American District Steam Company, North Tonawanda, N. Y., has issued bulletins Nos. 151, 152 and 153, describing its "Adsco Rotometer," "Adsco" water heaters and "Adsco" angle fittings, respectively.

Catalog.—The Ohio Brass Company, Mansfield, Ohio, has just issued catalog No. 18 for 1921, a 638-page illustrated volume covering the company's line of high-tension insulators, trolley line materials, rail bonds and tools, third rail insulators and equipment specialties.

Insulation Testing Sets.—James G. Biddle, Philadelphia, is distributing a folder on "Megger Testing Sets" for measuring the insulation resistance of wires, cables, generators, motors, transformers, switchboards, insulators, etc.

Engineering.—"Achievement" is the title of a folder being distributed by the J. G. White Engineering Corporation, New York City, dealing with the power and hydro-electric developments, transmission systems and other engineering projects of the company in this and in foreign countries.

Flooring and Steps.—Irving Iron Works Company, Long Island City, N. Y., has issued a seventy-two-page booklet-catalog with illustrations and descriptions of typical installations of "Irving Subway" ventilating flooring and "Irving Safstep" non-slipping steps.

Boiler Room Manual.—H. S. B. W.-Cochrane Corporation, manufacturer of boiler room equipment, has published a second revised edition of its 414-page manual entitled "Finding and Stopping Waste in Modern Boiler Rooms."

Switches for Battery Charging.—The Automatic Electrical Devices Company, 122 West Third Street, Cincinnati, has placed on the market a heavy duty self-closing underload switch (type M), with ratings of 50 amp. to 200 amp., designed for charging large storage-battery mining locomotives.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

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The Men Down the Line, as Well as the Boss, Have Brains

IN EXPLANATION of the good spirit which pervades a certain shop organization a foreman stated that the master mechanic treated his subordinates as if they possessed gray matter in their craniums. This seems like a simple and obvious proposition, but it merits more than a passing thought. After all, the men who in their daily work come into contact with equipment really know most about its shortcomings and are in a position to make excellent suggestions regarding the elimination of defects. Skilled mechanics are natural inventors, and they are in a position to invent useful practices if they know they are considered as more than mere machines, or as more than so many hands. Of course, through lack of opportunity to know what others have done, they will often, nay usually, reinvent what others have previously produced, but it is better thus than a sluggish mind and an apathetic attitude toward a task. Tactful leadership is required to secure alertness and efficiency in work without waste of effort in "wild goose chases" after impracticable ideas. Such leadership, however, is necessary if the best results with men are to be secured.

Do Not Expect the Committee Chairman to Do All the Work

THIS paper has commented from time to time upon the work and activities of the standing committees of the Engineering Association. While the work of these committees is in full swing, it seems worth while to call attention to the importance of committee work in general and to some matters in particular relating to their proper functioning.

In the first place the committees are organized to promote the advancement and application of scientific principles to the problems confronting the industry and to assist in the promotion of the education of the members of the association as individuals. In view of these objects, it is patent that membership in a committee calls for the performance of important duties and lays heavy responsibilities upon the individual members.

Some men accept committee membership lightly and exert no diligence in the work, not even to the extent of writing a letter; likewise they find trivial excuses for not attending meetings. Men of this character have no place on committees, and failure to perform a reasonable amount of work should be a bar to future appointment. Committee appointments are in a large sense privileges which carry duties which may not lightly be discharged. Mere "ornaments," who like to see their names in a list of committee members and refrain from justifying their appointment by engaging vigorously in the work, are hindrances to effective committee activity.

Sometimes the chairman is not the right man in the right place, but as a rule he has won his spurs through capable efforts while serving as a committeeman. It is obvious that the chairman should not be required to bear the responsibility for the work of the whole committee and at the same time find it necessary to do very much of the detail work. His function is principally that of an executive or manager who is expected to get results from the entire committee organization and to co-ordinate the work to the end that profitable reports are produced. Each committeeman should bear these facts in mind and endeavor to shoulder his part of the burden.

The reason why committees are divided into subcommittees for special consideration of each particular subject is that such division is necessary in order to develop intensive study, which always may best be done by small groups. It should be impressed upon each committeeman that the work of his sub-committee needs all the attention he can give it. And it is quite true that busy men can do a large amount of effective committee work if this work has really enlisted their interest. Time can usually be found for those things which are enjoyed in the doing.

Active committee work will generally yield a large return to the individual, and the meeting of minds during meetings of the committees cannot do otherwise than improve the mentality of those participating. The best results have only been attained by those committees wherein every member has done his level best to aid in the work. It should be remembered that the slang phrase "let George do it" is entirely out of place in committee work, particularly when "George" is supposed to be the chairman either of the whole committee or of the sub-committee.

Telephone Interference Factor Not an Accepted Unit

THE use of the "telephone interference factor" as an accepted and established standard of measure of the electrical interference of power lines on telephone circuits is being attempted. This intention developed at a recent hearing before one of the principal state public utility commissions, where this factor was entered as evidence by a witness under examination, who cited the American Institute of Electrical Engineers as the authority for the establishment of the unit. Those familiar with the activities of the Institute will recall that a study was undertaken, but by no means completed, to determine whether such a factor could be set up. At the present time the inductive interference committee of the National Electric Light Association and the wave shape committee of the Institute are carrying on studies designed to provide definite information from which further conclusions may be drawn. But at present there is no such factor with any official or authoritative sanction, and this fact should be borne in mind by electric railway engineers in participating in interference negotiation.

What Makes Transportation Customers?

IN A recent report on the traffic-provoking proclivities of large unit fares versus short-ride fares a noted engineer expressed the opinion that the large unit fare for a city, irrespective of distance, was the more valuable in promoting riding, inasmuch as it encouraged the spread of the population beyond walking limits. To put the thesis baldly: The way to secure riders is to generate conditions that preclude walking.

This statement bears affinity to that enunciated by the Hebrew glazier. Asked how he had built up his business, he remarked with a palpebral spasm of the left eye: "In the night mine boys goes out to break windows. In the morning I goes out to fix 'em. Dat's why I'm so busy alvays."

The subject of "What makes transportation customers?" offers too extensive a field for discussion to be taken up in detail here. The old story of the jocose glazier is quoted simply to point the moral that no business attains maximum selling power through the imposition of arbitrary force, no matter how concealed. We are all pretty confident that the prosperity of glaziers is not dependent upon the number of broken windows, but upon the extent of building activity and the growing appreciation of the value of glass in securing more light and, therefore, promotion of health and economy in artificial illumination. In other words, the glass industry wins out because people have been taught to want more glass.

The same psychology holds in the case of transportation. It is conceivable that a long-ride town may have more rides per inhabitant than a short-ride town if neither of the railways possesses the selling instinct. No undue risk is taken when the assertion is made that the short-ride town will show much the better results of the two if its management preaches with right service, right fares and right publicity the doctrine that every minute saved by the higher speed of the car is a minute added to the active life of the car user.

Are Poorly Paying or Abandoned Lines Worth Saving?

MUCH good should come of the investigation to be conducted under the direction of the Massachusetts Legislature of the reasons for electric railway abandonment in that state and what can be done about it, if anything. The study will be conducted by the Department of Public Utilities and will cover four topics. The first is to learn what railways, whether in operation now or not, are necessary to promote the public welfare and convenience in the localities served. The second is to determine whether it is desirable to restore service on any of the discontinued lines. The third is to decide whether the additional cost of service on lines now in operation above the popular unit fare should be borne by the public and if so how apportioned, and the fourth is whether the state should own and operate lines deemed necessary for the public welfare and convenience.

Undoubtedly some of the properties already abandoned or about to be abandoned never could have paid their way, even under more favorable conditions of operation than now exist. Another group probably would have continued to have earned living expenses and served the public if it had not been for the advent of the automobile, which has taken away a considerable part of the travel. A third group would probably have survived even this competition, if they have not been overwhelmed by burdens with which the railway man is familiar and which take the form of taxes, paving and bridge charges, and assessments of other kinds.

It will be part of the duty of the new commission to determine which of the roads composing these several groups are worthy of living or resuscitation. All perhaps are not. Nevertheless some of the lines now abandoned undoubtedly should be kept going in the interests of general economy. Finally, there is a good sized group whose construction would not now be considered, but are worth keeping because the tracks are now in. For such particularly the suggestion made in this paper some time ago by R. W. Perkins, president of the Shore Line Electric Railway of Connecticut, might be worth consideration. This was that the state should own the tracks, just as it owns the highways, for the sake of promoting travel. Then the rails could be leased to an operating company. Another principle for guidance was outlined at a hearing before the commission by F. J. MacLeod, street railway counsel, who suggested that each person of a community derives a double benefit from the local trolley line. One was individually as a car rider. The other was from the benefit which the community as a whole received. For the former he might well pay as high a fare as the traffic will bear without unduly discouraging the use of the utility. For the latter benefit, the community as a whole can properly contribute through taxes to the extent that the fares as determined by the plan mentioned above are insufficient to defray the legitimate costs of service.

Somewhat Different Motives Are Impelling Railroad Electrification Abroad and Here

WHILE railroads in the United States are marking time in the matter of electrification, pending the arrival of rejuvenated credit and cheaper money, they can learn much by keeping in touch with the accelerated electrification movement abroad. At the same time they must make due allowance for the differences in conditions which are bringing about electrification, and which are dictating the purpose of electrification on the two sides of the Atlantic. There the dominant motive is conservation, here it is increase in track capacity.

In all of the discussions of substitution of electrical motive power for steam in Great Britain and on the continent of Europe, the principal stress is being laid on saving in fuel. Some countries are dependent upon imported fuel, and obviously the less they are obliged to import the better for them. In other countries fuel is scarce and expensive, while "white coal," as water power has been felicitously nicknamed, is abundant. With the strong government backing which electrification has on the other side, the conservation appeal is strong enough to produce results.

While Americans want conservation, as well as many other desirable things, the economic pressure for it in this country is not yet sufficiently strong to overcome the forces which are holding back electrification here. The most powerful of these resisting forces are financial, the present difficulty of securing the capital needed for the change and the prospective one of making ends meet after the change is made. Again, a self-contained, one might say self-sufficient, motive-power unit like the steam locomotive is ideal from many points of view. Moreover, the steam locomotive is being improved so as to reduce the margin of possible fuel saving by change of motive power. But when a railroad is up against the proposition of increasing its track capacity, entirely different considerations enter. Wherever there is overtaxed track, electrification offers in general the cheapest solution of the congestion problem. Except where certain non-economic factors dictate, such as the necessity for eliminating smoke and gases in tunnels, the best place at which to expend the money that is available for electrification is at the congested points.

Besides the two salient differences which have been pointed out above, there are numerous minor considerations which require the discounting of European experience in application to American conditions. Here the tendency is toward enormously heavy tonnage trains, whereas there drawbars are weak and trains light. On the other side speed seems to be favored rather than tractive effort. The penchant of European railways for trying out new types of locomotives ought to be beneficial to railroad engineers in the United States. At present there is much of this process going on. This lends great technical interest to the present electrification activity on European roads.

The Madison Experiment with Safety Cars

THE standard type of safety car has been adopted by so many roads in the country it is not surprising that modifications have been suggested in it. Some of these have related to the construction of the car without change in its general design, so that in a sense they may not be considered as involving in any way the interchangeability of the car or its use on a system where cars of standard safety dimensions only are employed. Other changes have gone further, and of these probably the two which have been advocated more than any others provide for an increase in the size of the car to be used with one-man operation and an increase in the number of doors from one to two.

The thought underlying the standard plan of single entrance and exit for the standard safety car was that it would be of no value to interchange passengers faster than they could be handled by the car operator from the dual points of safety and efficient fare collection. Hence the one-way, single-file arrangement has prevailed, and the increased standing time has been more than offset almost everywhere by the greater acceleration and retardation effected, as well as the fewer stops caused by the smaller capacity car operated on a shorter headway, as compared with its larger rival. Nevertheless, the advocates of the two-door arrangement have continued their arguments in its favor, and this design is now receiving a trial at Madison, Wis. In the interests of car design such a test is desirable, because arguments in favor of the two-door arrangement have been continuous and a trial is the simplest way of determining its real merit. The test at Madison so far is said to be successful. It should be borne in mind, however, that this trial has been for only a limited time and on a very limited scale, as compared with the 4,000 or more safety cars of standard design in use elsewhere in this country. The conditions under which the test is being conducted also are exceptional, in so far as Madison is a college town and has few if any industries. Finally, a very great superiority for the two-door plan must be shown to commend it to the industry for adoption elsewhere to counterbalance the disadvantage it has of non-conformity to standard.

Efforts to increase the size and seating capacity of one-man cars over those of the standard safety car bring in a different set of considerations, as these efforts have been dictated in nearly all cases by a desire to convert former two-man cars to one-man operation rather than a desire to improve one-man car design. In some cases power operated doors and steps have been used, and in other cases they have not. Undoubtedly there are cases to which one-man cars of greater seating capacity than standard are adapted, these being generally on long suburban runs where the cost of running two-man cars would be so high that it would mean a very long headway, and where the average length of ride per passenger is considerable. In such cases there would not be the same tendency to congestion at the front of the car. Such a car, however, is avowedly an expedient and adapted only for definite and somewhat limited conditions. It is not suitable for congested city service.

The Indirect Economy of the Welder

EVERY electric railway management is now pretty well aware of the economy commonly effected through the use of a welding outfit to reclaim worn or broken equipment or special trackwork. This is the direct economy derived from extending the life of the piece required. There is also an indirect economy that is perhaps not so generally realized. An important track intersection will illustrate the point. Before the advent of welding outfits, it was necessary for the track department to purchase a replacement intersection at the first indication of failure or major deterioration, in order to have it on hand ready to install when the failure came. This might actually not occur for many months, but meantime several thousand dollars invested in the replacement is tied up and carried in the store's account. With the welder to depend upon, the superintendent of track knows that no matter how bad the intersection may get, he can always fix it up to give service for a few weeks more. Consequently, he does not need to purchase the new intersection until the full life of the old, as further extended by the welder, has been obtained, and until he is ready immediately upon receipt to put the new one in service.

This example multiplied over an entire railway system must mean a very substantial saving in the amount of money required to carry the store's account.

Quotation from the Federal Electric Railways Commission Report

No. 11

IT IS the law that utilities are entitled to a fair return upon the value of their property used in public service at the time of the inquiry. The methods for finding fair value are in dispute. No permanent solution of the electric railway question can be found in the absence of a finding of value for rate-making purposes. This applies to commission form of regulation, cost-of-service contracts, or public ownership and operation. The public should know what it is paying for, and this question cannot be settled without knowing what the property is worth.

Thirty Years of Municipal Operation

Municipal System in Ontario City Now Receiving Power from New Cameron's Falls Plant on Nipigon River, Purchasing This Through Hydro-Electric Power Commission of Ontario—City Also Has Small Water Power Development of Its Own—Some Early and Recent Facts Regarding the System Are Given

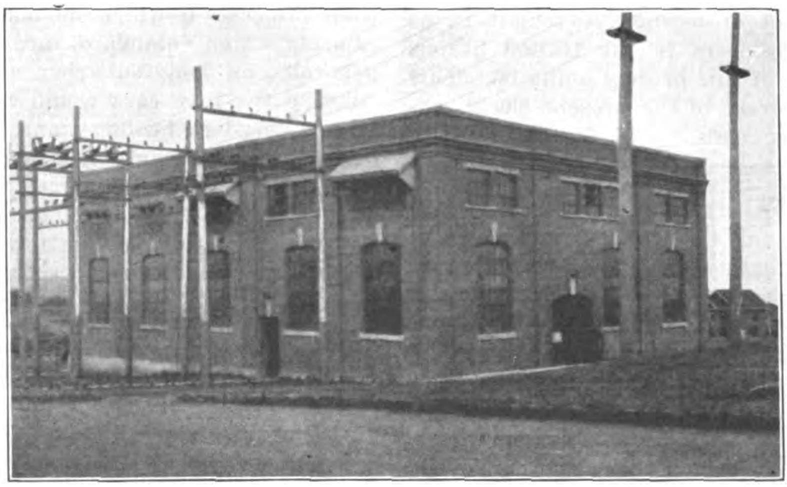
PORT ARTHUR, Ont., is a city of 12,000 or more inhabitants, which has had an interesting electric railway history. As in a number of other Canadian cities, the electric railways, as well as the other utilities, are municipally owned and operated. Desiring to study municipal operation at first hand, one of the editors recently visited this city and went over the property with M. M. Inglis, manager of the Public Utilities Commission of the city. The results of some of his observations are here set down, without comparison of conditions on other municipal or private properties. Port Arthur is located on the northwest coast of Lake Superior, contiguous to its slightly larger neighbor, Fort William. Both are wideawake little cities with many natural advantages and they are important lake ports, among other things being the western terminals for the Canadian Pacific line of lake steamers.

The development of the electric railway system of Port Arthur was traced in an address which Mr. Inglis gave a short time ago before a body of citizens of that city. He said that the system was inaugurated in 1891 and it was, he thought, the first municipally owned electric railway in Canada. To start the railway debenture bonds were issued in the sum of $75,000 on March 1, 1891, the bonds to run twenty years and to carry an interest rate of 5 per cent. Today the railway is capitalized at more than $785,000, not only covering the city of Port Arthur but extending into the adjoining city of Fort William.

From 1891 to 1908 the ownership and operation of the Fort William extension centered in the City Council of Port Arthur, but in 1908 arrangements were consummated whereby that portion of the system in Fort William became the property of that city by purchase, and the dual system was placed under the management of a joint board, composed of members from both cities. This arrangement continued from 1908 to 1913.

At the end of 1913 a complete separation, so far as ownership was concerned, took place, each city owning its respective system but continuing a through car service on both systems. When the joint board official existence terminated in 1913, the control and management of the Port Arthur system reverted to the City Council of Port Arthur and continued in its hands until the Public Utilities Commission was formed in 1915, which now administers the street railway.

Two types of debentures were sold to provide for the financing of the electric railway, namely, sinking fund debentures and serial debentures. The total par value of those issues since 1891 is $940,184. Anual interest and sinking fund charges are now slightly under $70,000.



THE CITY POWER SUBSTATION IN PORT ARTHUR

The assets of the civic railway at present comprise mainly the following physical properties: Twenty miles of track on a single track basis, carhouses and sheds, twenty-two convertible cars, five of which are single-truck cars; two trail cars, two combination work cars and snowplows and sweepers, one baggage car, one open trailer, power-plant machinery to the capacity of 2,500 hp. (the main power supply being purchased), overhead equipment, feeders, tools, etc., necessary for the operation of the system. A simplified map is reproduced to show the general layout of the railway lines.

The principal supply of power for the Public Utilities Commission was, until Dec. 20, 1920, furnished by the Kaministiquia Power Company, the power plant of which is located 20 miles west of the city. From this company, through the Hydro-Electric Power Commission of Ontario, the city purchased 7,000 hp. at 32,000 volts, three-phase, 60 cycles. In addition the city operates a water-power plant on the Current River, where approximately 2,500 hp. is produced at 2,200 volts, three-phase, 60 cycles. Since Dec. 20 the power has been purchased from the Hydro-Electric Power Commission direct.

The "Hydro Commission" furnishes this power from its new development on the Nipigon River at Cameron's Falls, about 70 miles east of the city. While the ultimate development on the Nipigon River will be in the neighborhood of 300,000 hp., provision is being made in the initial development at Cameron's Falls for six units of 12,000 hp. capacity each.

The power furnished by the "Hydro Commission" is brought to the eastern boundary of the city over a transmission line of wood-pole construction, at 110,000 volts.

At the boundary is a terminal station where the pressure is reduced to 22,000 volts; from the terminal station 22,000-volt power feeders run to the city of Port Arthur substation, where the interswitching, transforming and distribution of the local power supply are centralized.

The Port Arthur substation was originally built in 1910, but was enlarged three years later to meet the increasing demands for power for industrial purposes. It contains two 500-kw. synchronous motor-generator sets, provided with direct-connected induction starting motors, with wound rotors. These sets are used exclusively for supplying power to the Port Arthur Civic Railway. The two incoming 22,000-volt feeders are provided with the usual protective switching and metering equipment and the two 2,200-volt outgoing feeders are similarly protected and are controlled through remote-control oil switches. Branching from the outgoing feeders, through air-break switches fitted with horn gaps and mounted outdoors, is an additional feeder.

TABLE I—PASSENGERS CARRIED, BY YEARS

	Revenue Passengers	Transfer Passengers	Annual Total	Boundary
1915............	2,102,373	407,719	2,510,092	....
1916............	2,407,190	341,023	2,748,213	....
1917............	2,997,974	248,970	3,246,844	From July to Dec. 304,007
1918............	3,877,543	241,789	4,119,332	749,656
1919............	3,944,269	288,486	4,232,755	782,603

Provision is also made on the outdoor construction work for the transfer of the load from one outgoing feeder to another in the event of failure of any one of the oil switches in the substation, by means of the aforementioned air-break switches and a transfer bus.

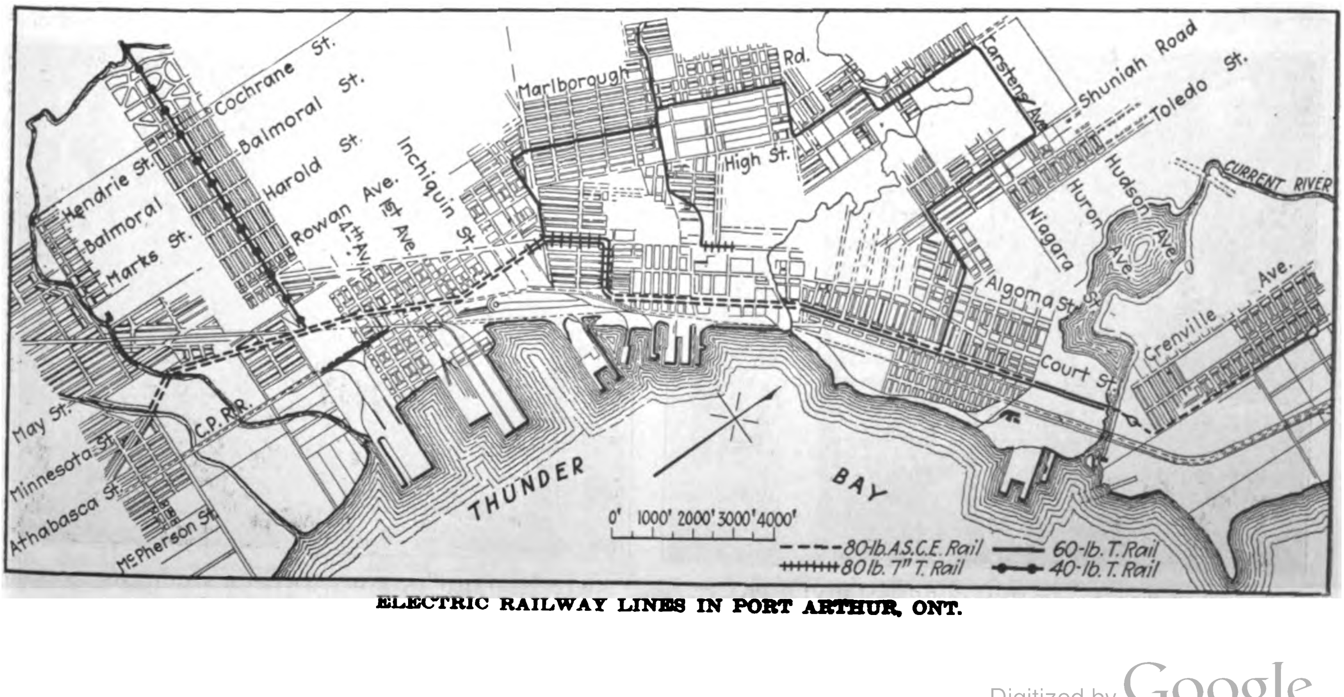
The substation also contains two sets each of three 750-kva., single-phase, oil-immersed water-cooled transformers for lowering the voltage from 22,000 to 2,200. There are also ten 2,200-volt remote-control feeder switches connecting the overhead distribution throughout the various sections of the city and supplying power for lighting transformers and small power consumers. Two 2,200-volt three-phase oil-immersed switches connected to overhead feeders are used in tying in the Current River power plant, which is about 2 miles from the substation.

The complete equipment of this substation was manufactured by Siemens Brothers, Stafford, England, and was supplied by the Siemens Company in Canada. Two photographs which are reproduced show the interior and exterior of this substation, including some of the outdoor overhead work, the motor-generator sets, and the 2,200-volt (low-tension) operating gallery.

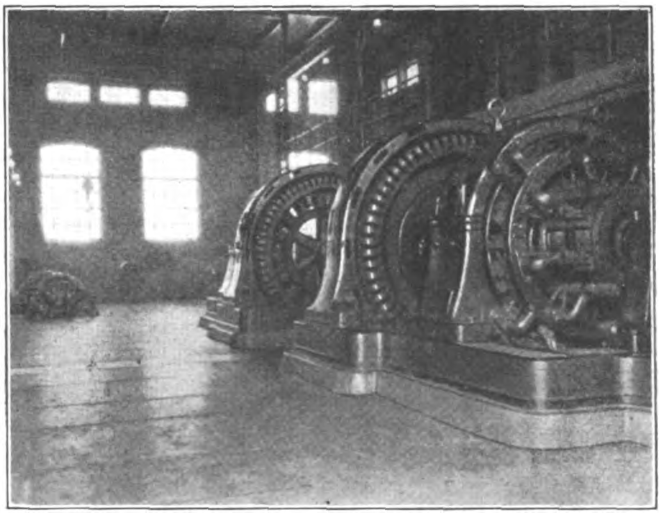
HEADQUARTERS OF PUBLIC UTILITIES COMMISSION OF PORT ARTHUR, TYPICAL CITY CARS IN FOREGROUND

THIS WATER-POWER PLANT IS OVER TWENTY-FIVE YEARS OLD

The Current River power plant was built in the period from 1903 to 1905 and is today in first-class condition. It contains four Allis-Chalmers generators, three alternating current and one direct current, all direct connected to Jenckes horizontal water turbines. The alternators are respectively of 600-kva., 250-kw., and


Cochrane St.
Balmoral St.
Harold St.
Hendrie St.
Balmoral
Marks St.
Rowan Ave.
4th Ave.
1st Ave.
Inchiquin St.
Marlborough
Rd.
High St.
Carstens Ave.
Shuniah Road
Toledo St.
Current River
Niagara
Huron Ave.
Hudson Ave.
Algoma St.
Court St.
Grenville Ave.
May St.
Minnesota St.
Athabasca St.
McPherson St.
C.P.R.R.
THUNDER
BAY
0' 1000' 2000' 3000' 4000'
80-lb. A.S.C.E. Rail
80 lb. 7" T. Rail
60-lb. T. Rail
40-lb. T. Rail

ELECTRIC RAILWAY LINES IN PORT ARTHUR, ONT.



HERE THE CITY TRANSFORMS POWER FOR THE RAILWAY AND OTHER LINES

250-kw. capacity, and all are provided with their own belt-driven exciters. There is also a separate 15-kw., 37-volt turbine exciter set, and to furnish an additional supply of direct current there is a 300-kw. synchronous motor-generator set, with a geared starting motor which can be disconnected by shifting the pinion on the motor shaft.

In one of the illustrations of this plant a 250-kw. alternator and the 200-kw. direct-current generator are shown, and in another the switchboard is the conspicuous feature. The latter contains three alternating-current generator control panels in the foreground, and there are local alternating-current distribution control feeder panels and direct-current generator and motor-generator control panels. All panels are fitted with necessary instruments and protective relay equipment. This switchboard was furnished by the Canadian Westinghouse Company.

SOME OPERATING DATA FOR THE SYSTEM

The accompanying tables give some of the latest operating data available at the time of the preparation of this article. The fare on the system until Sept. 1, 1920, was 5 cents, since which date it has been 6 cents.

The year 1919 was notable in the recent history of the Port Arthur Railway in that during the year the road earned the interest on the bonds and the contribution to the sinking fund, which was accomplished by more than doubling the gross revenue while holding the expenses to an increase of about 50 per cent. In 1919 the number of employees was sixty-one and they were paid $88,000. In the same year insurance and incidentals cost $19,000 and power $20,000.

As to accident expense, the city has been fortunate in that during the past five years only $8,340, an average of $1,688 for a year, has had to be spent in settling claims. This is approximately 1 per cent of the annual gross earnings.

The schedule speed of the cars in Port Arthur, as well as those in. Fort William, is high, averaging for the main-line cars about 11¼ m.p.h., although traffic conditions are making the maintenance of this speed increasingly difficult. City regulations require that a car shall stop at almost every street intersection. As in the downtown section the blocks are only about 250 ft. long, the speed in that section is necessarily slow.

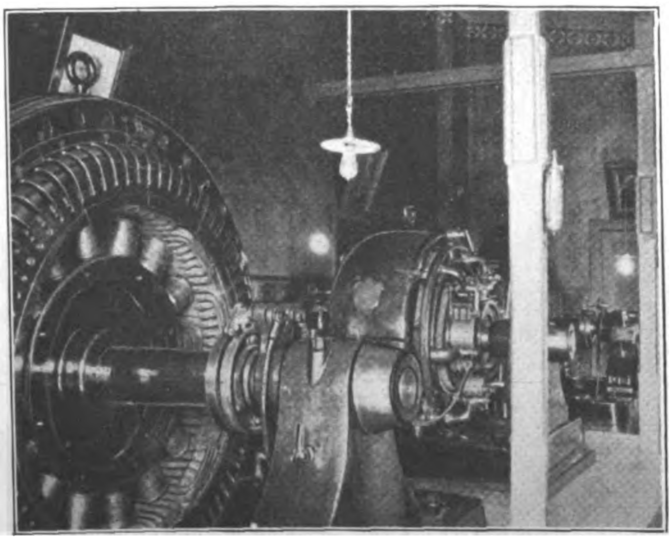
TABLE II—INCOME AND EXPENSE STATEMENT

	Gross Earnings	Maintenance	Operation	General Expenses	Total Operating Expenses	Net Operating Earnings	Interest, Sinking Fund, Etc.	Net Income or Deficit
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
1915 ..	94,989	14,919	57,139	10,019	82,077	12,913	76,006	63,093*
1916 ..	106,299	20,910	59,419	8,698	89,028	17,272	68,325	51,053*
1917 ..	125,902	28,789	66,060	7,853	102,702	23,200	69,002	45,802*
1918 ..	152,606	29,710	74,508	9,594	113,812	38,794	68,949	30,155*
1919 ..	196,442	29,988	85,743	11,350	127,081	69,361	69,361	......

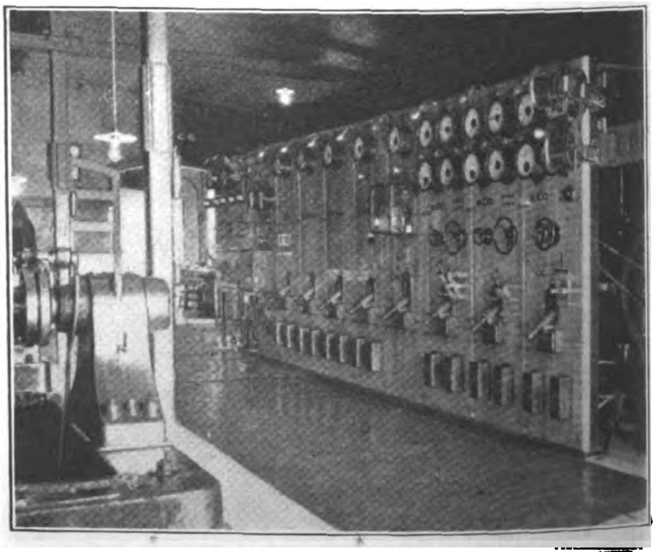
* Deficit.

TABLE III—OPERATING AND CAPITAL CHARGES PER CAR-MILE

		Operation							
	Maintenance	Power	Motormen's and Conductors' Wages	Other Expenses	General	Total Operation	Capital Charges	Grand Total	Car-Miles per Annum
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	
1915......	2.60	3.49	5.04	1.42	1.75	14.30	13.26	27.56	573,403
1916......	3.36	3.22	4.89	1.44	1.40	14.31	10.97	25.28	622,130
1917......	4.53	3.16	5.48	1.77	1.24	16.18	10.87	27.05	634,904
1918......	4.59	3.09	6.15	2.24	1.48	17.55	10.63	28.18	648,369
1919......	4.40	3.00	7.40	2.18	1.67	18.65	10.20	28.85	680,045



THESE VETERANS AT THE CURRENT RIVER PLANT LOOK GOOD AS NEW



SWITCHBOARD IN PORT ARTHUR'S CURRENT RIVER HYDRAULIC PLANT

Preparing for a Wage Arbitration

A Dialogue Purporting to Show that a Wage Settlement Involves More than Merely Selecting an Arbitration Committee—A Complete Outline for a Wage Study to Form the Company's Defense Is Presented

BY E. A. W.

MABEL, please give me Superintendent Jim." A brief waiting period only follows, for, like everything else on this particular utility property, efficiency in telephone service is as close to 100 per cent as anything can be.

"Good morning, Jim. How is everything going? That's fine. When you get your mail out of the way will you come up? I've got a job that's going to require some work and I want your help. Thank you."

Some time later in the morning the amiable and efficient superintendent of transportation smiled his way into the general manager's sanctum.

G. M. "Hello! already? Jim, we have been served notice that the men want another increase in wages. It's not on the cards, but under the terms of our labor contract it will have to go to arbitration."

S. T. "Well, that's easy; let the arbitrators do the work."

G. M. "I wish that was all there was to it. No, James, m'boy, we have got to furnish them with facts and figures—statistics, real and not imaginary. One reason the boys are after more money is that they have been reading a lot of college incubated stuff, 'Vaporings of Veal.' Some silk-shirted, silver-spooned graduate of Yarvard, who never carried a dinner bucket in his life, let alone do a laboring man's work, and never paid labor out of his own pocket, compiles a lot of so-called cost-of-living dope, minimum comfort budgets, basic living wage, or what not, writes a story about it and tells the mysterious stranger in our midst, 'capital,' to dig down and pay a minimum wage of $2,346.71 a year. Why? Because from carefully (?) compiled estimates, $2,346.71 is the least amount a man can live on today and bring up a family of five. In other words, $2,346.71 will only provide the minimum comforts of life as calculated from the cost of food, clothing, rent, movies, an automobile, player-piano, and a provision for old age. Jim, if every employer in the country paid a minimum wage of $2,346.71 today, what would the minimum comfort budget be tomorrow; and what would we have to do to meet it?

"If some of these college professors would devote their attention to methods of increasing production and *decreasing* costs and would realize that there is not and never can be a basic cost-of-living, we would all be better off. Somebody has said that there are as many 'standards of living as there are families.' We know the American standard is the highest of any country in the world. But no one yet has been able to make a man provide for old age unless he wanted to, and no one yet has been able to make Mrs. Brown a thrifty, provident, efficient housewife just because Mrs. Smith is, although the latter lady's husband draws $25 less per month than Mrs. Brown's."

S. T. "Chief, you are right! Take some of our old boys for example; talk to them and they will tell you how they paid for their homes and laid something aside for the winter of life, and they'll also tell you the younger element on the system is the cause of all the agitation and discontent. The young fellow has no responsibilities to speak of. He wants more money to spend, not to save. He wants high wages and short hours to have more to spend and more hours to spend it in around pool halls and jazz parlors."

G. M. "Well, we've got to get busy. I want you to work up an outline of the things we'll need to present the facts properly to the arbitrators. Let's put the matter up in the form of exhibits and cover the main points something like this:

"I. Cost of Living.

"II. Classification of Employees and Their Compensation.

"III. Comparison of Employment with Outside Occupations.

"IV. Service Requirements for the Public.

"V. Ability of the Company to Pay; i.e., Income and Expenses.

"VI. Justice of a Shorter Working Day.

"VII. Chronology of Events Leading Up to Wage Arbitration."

The S. T. copied the above outline on an envelope from his pocket and retired. Several days later he again obtained audience with his chief, and laid before him the details hereinafter enumerated, which the G. M. and S. T. carefully reviewed item by item.

I. *Cost of Living.*

1. Basic cost of living.
    a. State industrial commission's figures for this city
    b. United States Department of Labor figures for this city
    c. United States Department of Labor for cities of similar size in the United States
2. Minimum cost of living.
3. American standard of living (discussion)
4. United States Department of Labor statistics
    a. Charts showing income groups
    b. Charts showing surpluses and **deficits** from various income groups
5. Independent investigation made from study of market conditions and prices in newspaper files, and from prices submitted by various retail and wholesale houses, real estate agencies and from canvass made among employees
    a. Housing; rentals, or taxes and maintenance costs
    b. Carfare
    c. Food
    d. Clothing
    e. Fuel and light
    f. Health, medical attention, recreation
    g. Insurance; life, health, accident, fire, old age
    h. Sundries; charity, church, pleasure
6. Actual study of size of families from canvass made among employees
7. Application of values found under Section 5 to the individual members of the average family so as to arrive at values to apply to employees' families

8. Reference in detail to sources of information
9. Chart showing comparison of employees' compensation with basic living costs, pre-war time to present

II. *Classification of Employees and Their Compensation.*
1. Definition of total compensation
   - a. Actual wages
   - b. Transportation to employees and dependents
   - c. Insurance benefits and pensions
   - d. Uniforms
2. Each item defined under Section 1 above to be detailed, showing methods and rules surrounding each item of compensation other than wages
3. Above items spread against segregated classification of employees; i.e. employees grouped by departments and further by occupation; where compensation other than wages is paid for length of service, a further segregation into years of service will be made
4. Tabulation showing above spread against each man on the payroll, the headings of the column of this tabulation to be as follows:
   - a. Sequence in the order of compensation
   - b. Name
   - c. Rate of pay
   - d. Hours worked per month
   - e. Monthly pay
   - f. Turn-in allowance
   - g. Accident report allowance
   - h. Instructing student trainmen
   - i. Other miscellaneous cash compensation
   - j. Total cash compensation
   - k. Addition miscellaneous compensation
   - l. Total compensation
   - m. Days worked per month
   - n. Days failed to work
   - o. Maximum number of consecutive days off
5. Charts compiled from above data showing—
   - a. Per cent of trainmen in service (abscissae) against length of service in years (ordinates)
   - b. Voluntary resignation in per cent of trainmen plotted against length of service in years
   - c. Average age of employees in years plotted against length of service in years
   - d. The following curves on one chart:
     1. Basic living costs

     Average annual compensation of—

     2. All employees
     3. Regular trainmen
     4. Extra trainmen
     5. Shop employees
     6. Way and structures employees

   In each of these cases besides the general average compensation the compensation of the 10 per cent earning the maximum wages and the 10 per cent earning the lowest wage should be shown.
6. Wages paid for like occupations by other companies (listed by name) showing average rate paid after first year of service, and after the maximum hourly rate is reached; also length of service before reaching maximum rate.
7. Discussion

   Under this heading the desirability of the employment should be shown, its continuity or steadiness; flexibility in train service due to "sign-up" arrangements in effect; labor turnover as compared to other occupations; waiting list of men seeking employment and figures showing walks of life represented. It is a fact that almost every occupation and trade known is found on a street railway system. This is direct evidence of the desirability of employment.

III. *Comparison of Employment with Outside Occupations.*
1. List of outside occupations comparable with street railway work
   - a. Federal employees and their compensation
     Mail carriers
     Mail clerks, etc.
   - b. State employees and their compensation
     Highway department laborers, foreman, etc.
     Surveyors' assistants
     Janitors
     Clerks, etc.
   - c. City employees and their compensation
     Firemen
     Police
     Laborers, etc.
   - d. Railroad occupations closely allied
     Truckers
     Gatemen
     Pilots
     Baggage-checkers
     Station masters
     Laborers, etc.

   Employees of:
   - e. Moving and storage companies
   - f. Office buildings
   - g. Hotels
   - h. Department stores
   - i. Wholesale houses
   - j. Retail groceries
   - k. Produce houses
   - l. Bakeries
   - m. Feed and grain establishments
   - n. Drug stores
   - o. Furniture stores and factories
   - p. Clothing stores and factories
   - q. Gasoline and lubricant stations
   - r. Tire industries
2. Seasonal employment in other industries
3. Tabulation and summaries showing average total compensation
4. Discussion in detail of street car platform and maintenance work and comparison with other occupations closely allied. (Here mincing of words or equivocating must not be resorted to; call a spade a spade. Take up each department and its subdivisions, cover the class of work done and the responsibilities and capabilities involved).
5. Chart showing—
   - a. Basic cost of living as in Section II, subdivision 5-d-1.

   Average annual compensation of—
   - b. Street railway platform men as in Section II-5-d-3
   - c. Street railway shop and car house men as in Section II-5-d-5
   - d. Street railway way and structures employees as in Section II-5-d-6
   - e. Truck drivers in other industries
   - f. Retail grocery clerks
   - g. Federal employees
   - h. Skilled mechanics
   - i. Carpenters
   - j. Bricklayers

G. M. "There is a trinity in business the parties to which must be kept in proper relation to each other. It comprises the customer, the employee and the owner. Any unbalanced condition here results in hardship for those at a disadvantage."

IV. *Service Requirements for the Public*
1. Discussion of public needs in way of betterments, attention to deferred maintenance items, etc.
2. Detailed lists of principal items and estimated amounted required for each item segregated between rolling stock, track, overhead lines, power, buildings, etc.

S. T. "The next subdivision you assigned me, Chief, is a hard one—'Ability to Pay.' Labor, as a general proposition, maintains that this is a matter that should not be injected into wage demands. The new claim that the company's ability to pay is up to the company, that this is a condition that must be met by the company and not the men."

G. M. "In some other businesses this contention might be true, but we have our income fixed for us without regard to our expenses, so the argument does not hold. The men would have a good reason to object to this matter being included in our presentation if they could prove that we are not paying a living wage now; in which event we would have to seek relief or else back the cars into the car houses and quit. Any business that cannot pay its men a reasonable compensation is economically water-logged and should be allowed to sink."

S. T. "It seems to me that there is a moral obligation on the part of the company to the public that the arbitrators cannot lose sight of. If they hand down an award that will require fares away in excess of reason or what the public will pay, then their work will go for naught and will have to be done over, always assuming that the men are being paid above a living wage."

V. *Ability of the Company to Pay.*
1. Income and expense statement
   a. For past year
   b. For current year
   c. Forecast for the ensuing year
2. Investment and valuation figures
3. Discussion of depreciation; need for providing for extraordinary renewals out of earnings
4. Efficiency in operation; charts showing—
   a. Comparison of operating costs on a car-mile and car-hour basis with other cities of similar size
   b. Comparison of operating ratios reduced to an equivalent basis with other cities of similar size
5. Discussion presenting arguments sustaining the contention that, under the circumstances and restrictions and regulations under which the company operates, the arbitrators must give proper weight in their deliberations to the item "Ability of the Company to Pay."

G. M. "This discussion is all right, Jim, unless it is found that the wages being paid are so low that they do not provide a living for the employee, in which case at least a living wage should be awarded and the company take the necessary steps to meet the award."

S. T. "Some of the men talk an eight-hour day. There is no doubt that in some classes of work an eight-hour day is proper and necessary. But I am convinced that our men don't want eight hours work and no more. What they want is a basic eight-hour day and plenty of overtime at one and one-half times their regular rate. Under the next subdivision this matter should be thoroughly discussed and each argument already advanced, and any we can anticipate, answered."

VI. *Justice of a Shorter Working Day.*
1. Discussion of the occupation of the street railway man from a health standpoint.
2. Detailed run-assignment chart showing—
   a. Regular runs
   b. Regular daily extras
   c. Trailers
   d. Scheduled hours of various types of runs
   e. Actual hours worked on various types of runs
   f. Elapsed time on various types of runs
3. Discussion of shorter working day from an increased production standpoint.
4. Discussion of the shorter working day as a means of securing additional compensation at a high hourly rate.
5. A fair working day in train service.

S. T. "In this next section we should work up a résumé of the situation and draw attention clearly, concisely and without bias to the major matter involved. If general dissatisfaction and discontent have been present, let's tell the arbitrators about it. On the other hand, if a few agitators are making all the thunder and are receiving half-hearted support from our men, let's frankly say so."

G. M. "In other words, Jim, we should attempt to prove that harmonious relations have been the usual thing on this property and by presenting a history of events leading up to the demand for increased wages bring this point out. All right, let's see how you have covered this."

VII. *Chronology of Events Leading Up to the Present Wage Arbitration.*
1. Copy of contract with employees
2. Discussion of contracts
3. Regulatory situation; attitude of utility commission and city government
4. Brief summary of other wage awards and reasons therefor
5. General discussion on rates of fare and wage rates and possibilities of increasing both

G. M. "Well, as a starter, Jim, that outline will keep some of us busy around here for a week or so. There is no doubt that when we get into the job of working up detail, a lot of other ideas will pop up. Now, whom shall we put on the job?"

S. T. "If you'll let me handle the detail and you put the finishing touches to the completed report, I'll apportion this program to various heads of departments and follow them up. First, I'd suggest a round-table meeting at which you go over the details and tell the crowd the whys and wherefores."

G. M. "We'll meet here tomorrow morning at nine o'clock."

Changes in Living Costs

THE following tables show the cost of living in eight cities in the United States in December, 1919. Table I, which gives the percentage that each group of items bears to the total in December, 1920, indicates that food was the cheapest in Seattle, clothing in Baltimore, rents in Philadelphia, fuel and light in Cleveland and furniture and furnishings in New York. The miscellaneous group is less in Detroit.

TABLE I—PER CENT OF TOTAL EXPENDITURES

	Baltimore	Cleveland	Chicago	Detroit	New York	Philadelphia	San Francisco and Oakland	Seattle
Food	42.0	35.6	37.8	35.2	42.0	40.2	37.9	33.5
Clothing	15.1	16.0	16.0	16.6	16.6	16.3	16.6	15.8
Housing	14.0	16.4	14.9	17.5	14.3	13.2	14.8	15.4
Fuel and light	5.0	4.1	6.0	6.3	4.3	5.1	4.1	5.4
Furniture and furnishings	4.3	6.0	4.4	5.9	3.3	4.4	4.2	5.1
Miscellaneous	19.7	21.8	20.6	18.3	18.7	20.8	22.4	24.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

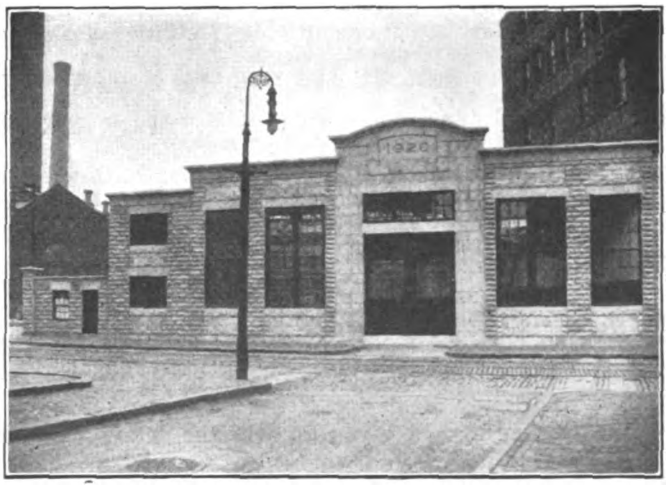
Table II shows how the total cost of living has changed in various cities from December, 1914. An analysis of the table indicates San Francisco and Oakland to be the cheapest places in which to live, with Chicago, Seattle, Baltimore, Philadelphia, New York, Cleveland and Detroit following in the order named.

TABLE II—PERCENTAGE CHANGE IN LIVING COST FROM DECEMBER, 1914

	Baltimore	Cleveland	Chicago	Detroit	New York	Philadelphia	San Francisco and Oakland	Seattle
December, 1915	*1.4*	1.4	3.0	3.5	2.0	1.2	*1.7*	*1.0*
December, 1916	18.5	19.1	19.5	22.3	14.9	14.7	8.3	7.4
December, 1917	51.3	42.9	41.8	49.9	44.7	43.8	28.6	31.1
December, 1918	84.7	71.4	72.2	78.0	77.3	73.9	57.8	69.9
June, 1919	84.0	77.2	74.5	84.4	79.2	76.2	65.6	76.9
December, 1919	98.4	95.1	100.6	107.9	103.8	96.5	87.8	97.7
June, 1920	114.3	116.8	114.6	136.0	119.2	113.5	96.0	110.5
December, 1920	96.8	104.0	93.3	118.6	101.4	100.7	85.1	94.1

Italics indicate a decrease; roman numbers indicate an increase.

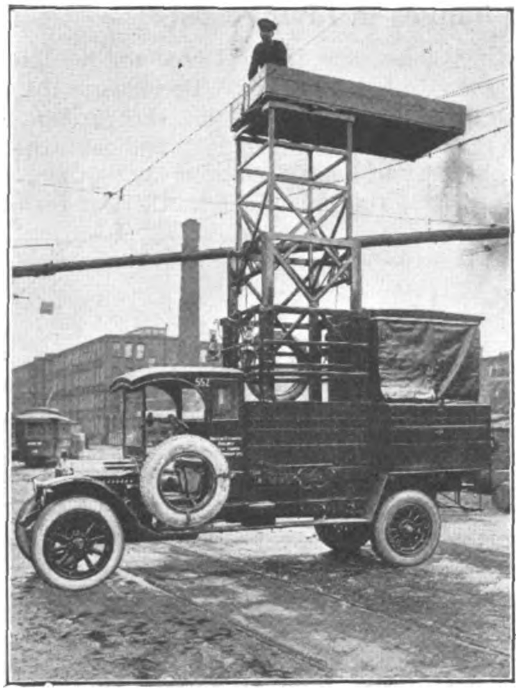
The information contained in these tables was prepared and issued as Bulletin 961 by the United States Department of Labor, Bureau of Labor Statistics, Washington.



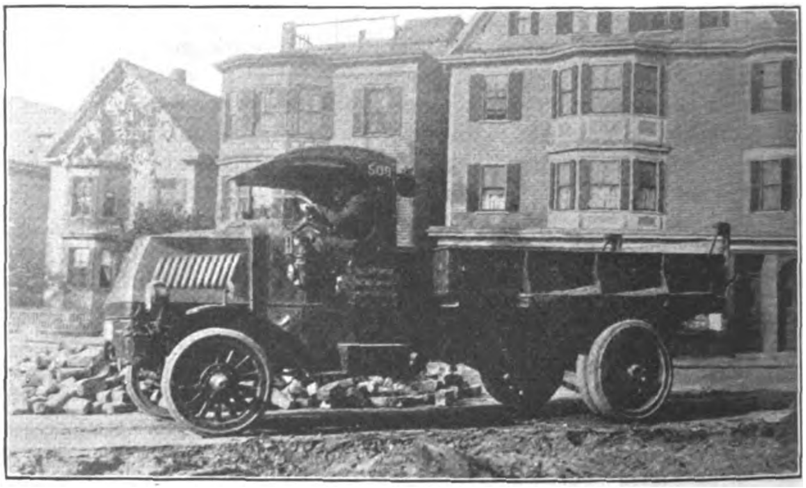
GENERAL APPEARANCE OF CENTRAL GARAGE ON HARRISON AVENUE

OUTSIDE VIEW OF TYPICAL SUBSTATION GARAGE AT SULLIVAN SQUARE, CHARLESTOWN

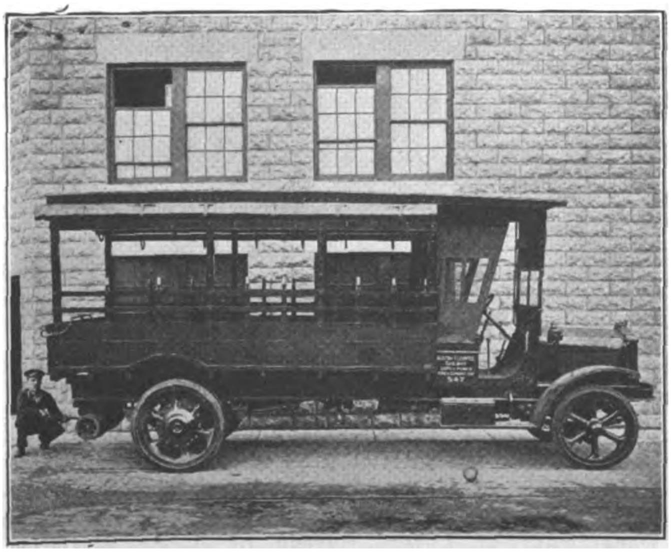
Illustrations of Typical Garage Buildings and Automotive Service Equipment in Use by the Boston Elevated Railway



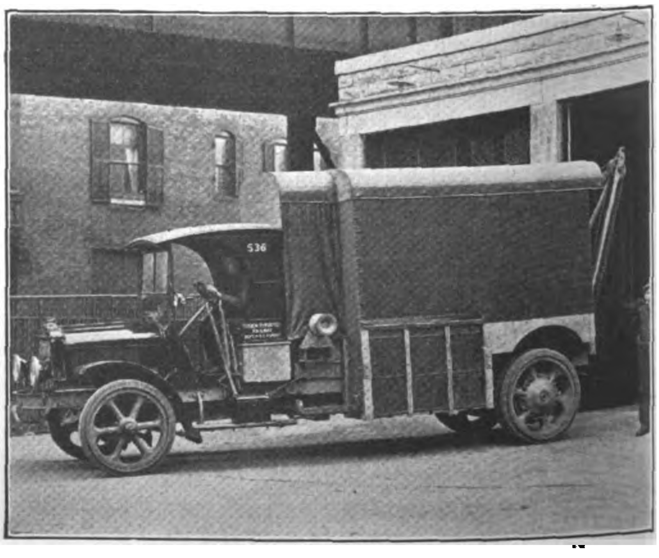
WHITE TYPE OF MOTOR-DRIVEN EMERGENCY TOWER WAGON



FIVE-TON MACK DUMP TRUCK USED BY TRACK DEPARTMENT



WHITE TYPE OF HEAVY LINE WORK TRUCK WITH WINCH AT REAR



WHITE TYPE OF WRECKING TRUCK WITH A 7-TON DERRICK

Replacing Horses with Motors and Trucks

The Boston Elevated Railway Saves 25 per Cent in the Operating Cost of Emergency and Trouble Wagons—Purchases Thirty-two Trucks and Builds New Garages—The New Motor Equipment Is so Located as to Be Able to Reach Scenes of Trouble with a Minimum of Delay

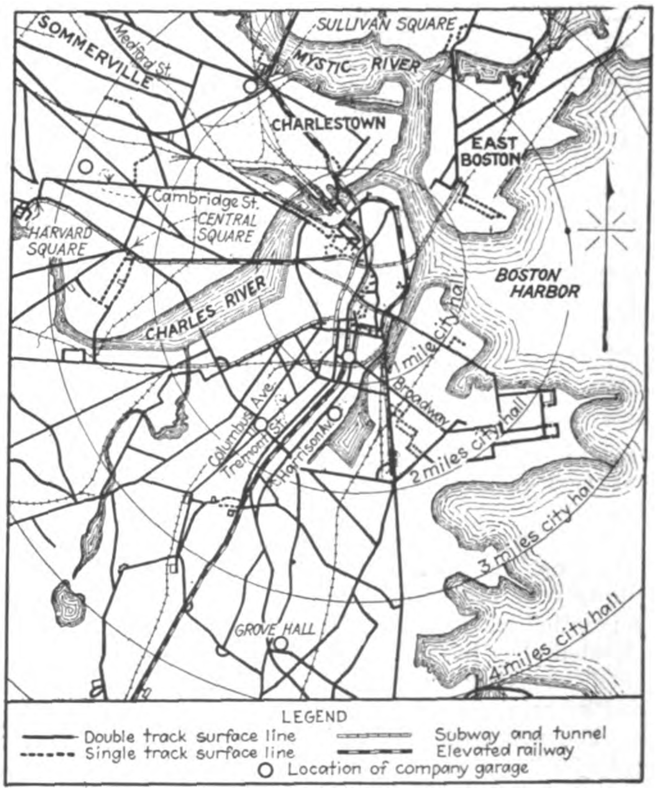
By EDWARD DANA
General Manager Boston Elevated Railway, Boston, Mass.

DURING the year 1920 the Boston Elevated Railway made substantial progress in replacing horse with motor vehicles in the interest of economy and efficiency. Thirty-two motor vehicles with a total capacity of 25 tons were purchased at a cost of approximately $138,000. The 5-ton trucks were of the Mack type and the balance White trucks. A list follows:

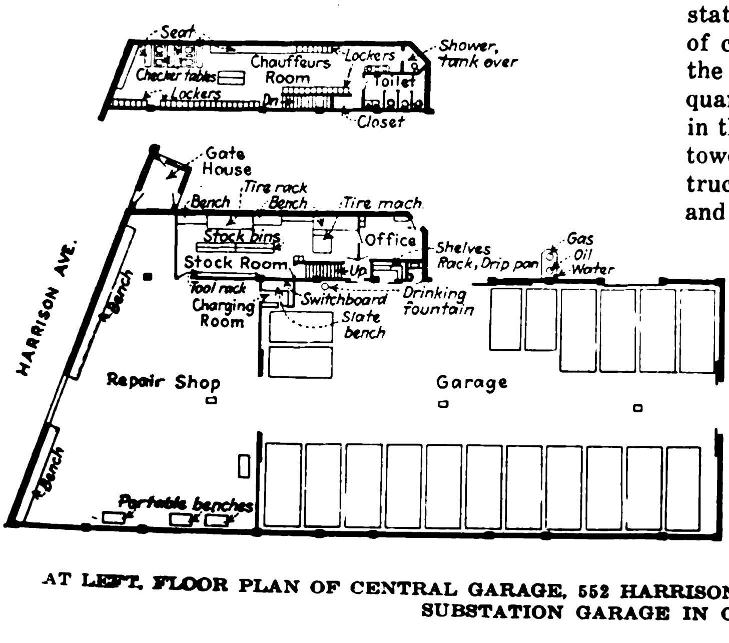
Five 5 -ton dump trucks.
Three 3½-ton wrecking trucks.
Two 3½-ton platform trucks.
One 3½-ton wire department truck.
Nine 2- ton tower trucks.
Two 2 -ton platform trucks.
Two 2 -ton covered express trucks.
One 2 -ton army body truck.
Four ¾-ton express trucks.
Three ¾-ton switch repair trucks.

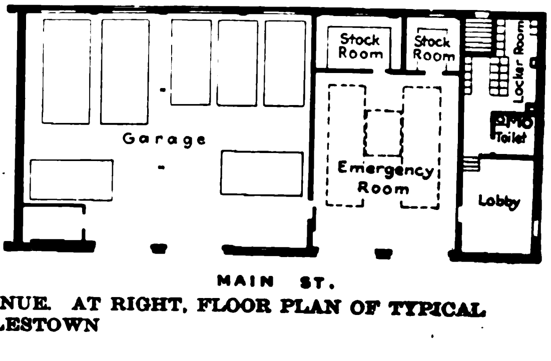
In order to accommodate such a fleet of motor vehicles it was necessary to provide garage facilities. Five modern fireproof buildings were constructed and a section of an existing brick building was also partitioned off as a garage. The construction of these accommodations called for an expenditure of $198,000.

These buildings were located, as shown on the map, at Harrison Avenue, Broadway, Grove Hall-Roxbury, Sullivan Square, Camden Street and Baldwin Street, Cambridge. The central garage, having a storage capacity of forty cars, was located at Harrison Avenue, at which point is located the headquarters of the wire and conduit division and the company's present machine shop. This garage is of modern construction throughout, built of concrete blocks and equipped with repair shop, storeroom and chauffeurs' quarters. The general arrangement is shown on the floor plan. The type of construction is also illustrated. The floor plan and an outside view of the Charlestown Station, a typical so-called substation garage, are also shown. Except for the storage of certain trucks these substation garages are used for the emergency line service and wrecking truck headquarters. The most important types of trucks are shown in the accompanying illustrations and are the emergency tower wagon, heavy line work truck with winch, wreck truck equipped with derrick capable of lifting 7 tons, and 5-ton trucks for construction work in the depart-


Sommerville
Medford St.
Sullivan Square
Mystic River
Charlestown
East Boston
Cambridge St.
Central Square
Harvard Square
Charles River
Boston Harbor
1 mile city hall
Broadway
Columbus Ave.
Tremont St.
Harrison Ave.
2 miles city hall
3 miles city hall
Grove Hall
4 miles city hall
LEGEND
Double track surface line
Single track surface line
Subway and tunnel
Elevated railway
O Location of company garage

MAP OF BOSTON ELEVATED RAILWAY, CENTRAL DISTRICT, SHOWING LOCATION OF GARAGES WITH RESPECT TO LOCATION IN THE HEART OF THE SYSTEM


Seat
Shower, tank over
Chauffeurs Room
Lockers
Toilet
Checker tables
Lockers
Dr.
Closet
Gate House
Tire rack
Bench
Bench
Tire mach.
Stock bins
Office
Shelves
Rack, Drip pan
Gas
Oil
Water
Stock Room
Up
Tool rack
Charging Room
Switchboard
Slate bench
Drinking fountain
Harrison Ave.
Bench
Repair Shop
Garage
Bench
Portable benches


Stock Room
Stock Room
Locker Room
Toilet
Garage
Emergency Room
Lobby
MAIN ST.

AT LEFT, FLOOR PLAN OF CENTRAL GARAGE, 552 HARRISON AVENUE. AT RIGHT, FLOOR PLAN OF TYPICAL SUBSTATION GARAGE IN CHARLESTOWN

TABLE I—SCHEDULE 3337-R—LIST OF TOOLS CARRIED ON WRECKING WAGONS—BOSTON ELEVATED RAILWAY

Axe	One
Bars	One 60-in. crow
Bars	Two 60-in. pinch
Bars	One 30-in. cutting
Bars	One 30-in. pinch
Bolts	One of each size motor and gear case bolts
Bolts	One motor eyebolt
Bolts	½-in. M bolts assortment 2 in. to 8 in. long
Bolts	⅝-in. M bolts assortment 2 in. to 8 in. long
Bolts	¾-in. M bolts assortment 2 in. to 8 in. long
Bolt cutter	1¾ in.
Blocking	Four 6x6 in. x 2 ft.
Blocking	Four 4x6 in. x 2 ft.
Blocking	Four 2x6 in. x 2 ft.
Blocking	Four 1x6 in. x 2 ft.
Blocking	Two 3x8 in. x 2 ft.
Blocking	Two 2x4 in. x 6 ft.
Blocking	Two 2x4 in. x 12 ft.
Blocking	Two 4x4 in. x 12 ft.
Blocking	Two 4x6 in. x 12 ft.
Blocking	Two 6x6 in. x 12 ft.
Blocking	One hardwood cut for broken axle
Couplings	Two drawbar couplings for each type of car
Chains	2¾ in. x 6 ft. with ring and grab hook
Chains	1¼ in. x 12 ft. with ring and grab hook
Chains	2⅝ in. x 10 ft. with ring and grab hook
Chains	2⅛ in. x 6 ft. with ring and grab hook
Chains	1¾ in. x 5 ft. with ring and grab hook
Chains	1¾ in. drag chain
Chisels	2¼ in. old chisels
Chisels	One blacksmith's cold chisel
Connectors	Three No. 6 two-way and three No. 4 two-way
Drawbar	One extension
Drag rope	2¾-in. wire, 25 ft. long
Flashlight	One large size
Fuses	For all types of cars
Gloves	One pair rubber gloves
Grease	One 5-lb. can of cup grease
Hammers	One hand-hammer 2¼ lb.
Hammers	One sledge-hammer 10 lb.
Hawkes device	One for broken wagon axles
Hoist	One 2,000-lb. Harrington
Jacks	Two 15-ton Simplex or quick-acting jacks
Jacks	Two 15-ton and two Simplex No. 310 adjustable base
Jacks	Two 25-ton Norton self-lowering
Lamp	One extension lamp
Lantern	Two inspectors to be maintained ready for service at all times
Nails	One assortment of various sizes
Oil can	One squirt can filled with oil
Planks	One 2x8 in. x 8 ft.
Planks	One 4x8 in. x 8 ft.
Pliers	One pair gas pliers
Pliers	One pair cutting pliers
Picks	One
Pins	One assortment of all sizes of cotter pins
Plates	Three ¾x6x15 in. steel
Punches, drift	Three, assorted sizes
Punches, drift	One blacksmith's ¾ in.
Replacers	Four Tilden car replacers
Rope falls	One with double blocks and 400 ft. 1-in. rope
Rope slings	Two 1-in. rope, 4 ft. long
Snatch block	One for 1-in. rope
Saw	One hand saw—crosscut
Shovels	Two
Screwdrivers	One each 6-in., 12-in., 18-in.
Tripod	One
Tape	One roll
Twine	100 ft. heavy twine
Trolley wheel	One
Trolley wheel spindle	One of each type
Trolley cord	One
Trolley wire pick-up	One
Truck	One for broken wagon axles, to be hung over wrecking wagon with rope falls and dropped onto wagon when responding to calls for broken-down teams
Truck	One four-wheel truck for broken-down autos
Timber	One 6x8 in. x 10 ft. to be kept near wrecking wagon and taken when call indicates serious car wrecks
Waste	5-lb. clean cotton waste
Washers	Assortment 1½-in. down
Wheel skid	One cradle for broken wheels and axles
Wire	20-ft. No. 6 wire
Wood pry bar	One 10-ft. long
Wrenches	One fork, 1¾x1⅝ in.
Wrenches	One fork, 1x¾-in.
Wrenches	One fork, ¾x⅝ in.
Wrenches	One fork, ½x⅜ in.
Wrenches, monkey	Two each 6 in., 10 in., 14 in., 18 in.
Wrenches, stilson	One each 14 in., 24 in.

ment of maintenance-of-way. The remaining trucks are of various sizes for transportation of material and supplies.

In addition to economy in the handling of supplies the most important feature is the time saved in handling wire breaks or wrecks which interfere with the operation of the cars. These emergency trucks are so located that the entire system can be easily protected and the proper truck landed at the location of the trouble with a minimum of delay.

The wrecking facilities previously had consisted of old 20-ft. cars equipped with wrecking material, but as these cars could not get close to the scene of trouble they were awkward and inefficient, and while still available in extreme emergency they will rarely if ever be pressed into service. The previous methods were described in the ELECTRIC RAILWAY JOURNAL of May 23, 1914.

The accompanying Table I shows the equipment carried on three large White wrecking trucks, previously illustrated.

The foreman in charge of the trucks is held absolutely responsible for knowing that such tools and equipment are on the wrecking wagons at all times and is held strictly accountable for any negligence in the checking up of the tools after the trucks have been out on duty.

A summary of the complete provision for handling wrecks or other track obstructions on the surface lines is given in Table II. Practically all of this work is now handled by the auto trucks, and the former single-truck trolley wrecking cars are maintained for extreme emergency use only.

By the use of these auto trucks in their present locations it has been possible to reduce the number of men in the wire emergency service from fifty-one to forty-four. The use of the motor-driven vehicles has made it possible to dispose of a large number of vehicles and forty-five horses and to abandon four stables previously used.

These changes alone have made an approximate saving of $85,000 a year in maintenance expenses, equivalent to about 25 per cent on the investment in auto trucks and housing facilities. It has also resulted in a material improvement in the physical condition of the horse-drawn equipment because the horses and vehicles which were selected for disposal were those in the poorest condition.

TABLE II—LOCATION OF WRECKING STATIONS, EQUIPMENT IN EACH AND FORCE NEEDED TO MAN WRECKING TOOLS AND EQUIPMENT—BOSTON ELEVATED RAILWAY

Location	Type of Wrecking Car or Truck	Wrecking Tools and Equipment	Wrecking Force
Broadway wrecking station	Auto truck	Complete equipment as per schedule 3337-R	Three shifts: two men each: foreman and repairman
Charlestown Neck wrecking station	Auto truck	Complete equipment as per schedule 3337-R	Two shifts by truck driver-repairman (6 a.m. to 12 midnight). Wrecking crew from carhouse.
Grove Hall wrecking station	Auto truck	Complete equipment as per schedule 3337-R	Two shifts by truck driver-repairman (6 a.m. to 12 midnight). Wrecking crew from carhouse.
Park Street	20-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
Milton	20-ft. box car	Partial equipment	From carhouse force—available all hours.
North Point	20-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
Jamaica Plain	25-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
Amory Street	20-ft. box car	Partial equipment	From carhouse force—available all hours.
Reservoir	25-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
Watertown	20-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
East Boston	20-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
Bennett Street	25-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
Salem Street	25-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.
Everett	20-ft. box car	Partial equipment	From carhouse force—available all hours.
Clarendon Hill	20-ft. box car	Complete equipment as per schedule 3336-R	From carhouse force—available all hours.

This Is the Fourth of a Series of Articles on the Report of the Federal Electric Railways Commission, Written by a Commissioner

The Report from a Financial Standpoint

Suggestions Made as to Clauses Which Must Be Provided in Service-at-Cost Franchises to Commend Them to Investors—Adjustment of Capitalization to Value Discussed—Re-establishment of Credit a Long Process and Accomplished Only as the Average Investor Becomes Reassured of Essential Character of Business Done and Willingness of the Public to Permit a Fair Return

BY CHARLES W. BEALL
Vice-President Harris, Forbes & Company, New York

TWO recommendations of the Federal Electric Railways Commission seem to have attracted more criticism than any of the others. One is the reference to the service-at-cost franchises. The other is that no satisfactory solution of the electric railway problem can be made which does not include a fair valuation of the property employed in the public service and the statement that where this is done the company should voluntarily reduce any excessive capitalization to the basis of such value.

SERVICE-AT-COST NOT OBLIGATORY

Service-at-cost, it should be explained, is not urged upon the companies for immediate adoption. In fact, the report says definitely that such contracts are in the experimental stage, but the commission found that where these contracts have been tried they seem to have secured a fair return upon capital, established credit and effected reasonably satisfactory public service, and the commission believes that such contracts may be safely entered into where the public right eventually to acquire the property is safeguarded.

In my opinion service-at-cost is the most practical system of relation between the city and the company which has yet been offered, but it is not perfect, and as experience with it is continued undoubtedly the plan will be improved in detail. To be satisfactory every service-at-cost plan ought to be an indeterminate permit, and if limited in time the rate of fare and the earnings permitted should be sufficient during the life of the franchise to amortize the investment, and there should be a clause providing for a renewal of the franchise in case the investment is not amortized.

Every service-at-cost plan should also provide sufficient funds to take care of any temporary lack of earnings arising when there is a change from a low fare to a higher fare, and also a proper fund to provide for depreciation and obsolescence of the property. These funds should be provided either out of the income allowed to be earned on the property, or if the original amount of such funds is furnished by outside capital and charged to capital account and represented by securities such funds should be included in the value of the property on which the company is allowed to earn a proper income. Very few service-at-cost plans provide funds of this account in sufficient amount. In some cases the amount so reserved is a specified sum, but it is much better to have this sum bear some definite relation to the earnings, the size of the property and the service performed. Otherwise, with an expanding system, the fund would decrease in its relation to the property.

Another point upon which question has been raised in connection with service-at-cost franchises is whether it is desirable to provide an incentive to the company to give service at the lowest possible cost. In some of the later franchises an attempt has been made to provide for this by means of a sliding scale of return, varying with the rate of fare, a higher percentage of return being permitted on the admitted value of the property when the lower scales of fare are in force. While none of these attempted incentives to economy on the part of the company has been entirely satisfactory, undoubtedly progress has been made toward the solution of this problem.

One definite fact has been determined in regard to service-at-cost franchises. From the standpoint of interesting the investor it is fatal to fix a maximum rate of fare. The future is always shrouded in uncertainty and conditions unforeseen at the time that the franchise was drafted may arise which would make any fixed maximum rate unprofitable for the company.

ADJUSTMENT OF CAPITALIZATION TO VALUE

The second point mentioned above, the adjustment of the capitalization to accord with the value of the property, is undoubtedly desirable for both the company and the public. This does not mean, however, that it can always be done. It is easy to see that legal difficulties may often arise, especially with companies having a large number of security holders and many classes of securities. If the corporate organization of the company is simple and the security holders few the plan is much more easy of accomplishment. The proportion of assenting security holders necessary to carry out such a plan depends upon the laws of individual states.

ERRORS IN FINANCING

The report mentions a number of errors in the early financing of the electric railway properties which contributed to bring about their present plight. These errors had their foundation largely in an exaggerated belief held in the early days of the profits of electric railways and resulted in failure fully to care for depreciation or amortize obsolescence, and in some cases the payment of unearned dividends. During these days extensions were built which economically had no right to exist.

These were undoubtedly serious financial errors, but much can be said in extenuation of the companies.

In the first place, during the early years of electric railway operation neither the management nor the public realized the rapid improvement and changes in the art nor the wear and tear of equipment which would take place in electric railroading. In consequence they did not understand the large amount which would be required for obsolescence and depreciation. Obviously the public profited by these mistakes because the fares charged were insufficient to pay for the service. Later, as the facts became evident and costs increased while fares remained stationary, efforts on the part of the companies to secure increased compensation were denied. It is only recently that authorities have begun to pay attention to the outstanding needs of the companies. It is safe to say that now no electric railway company can sell its securities unless it has such a rate of return as to cover these charges and pay a fair return on its capitalization.

The electric railway situation at present is in the anomalous position of being an essential utility unable to finance its expansion to keep pace with the development of the community which it serves. As the population of a city grows the demands for urban transportation increase in even greater ratio, but as the capital investment required for this expansion varies between $3 and $6 for each increase of $1 in gross receipts it is obvious that the railway cannot finance its growth without outside help. Yet there has been practically no new financing of electric railways in Wall Street for a long time other than those instances of railways combined with electric lighting and power companies.

The re-establishment of credit will be a long process and it can be accomplished only as the average investor becomes reassured of the essential character of the business done and the willingness of the public to permit the company to earn a fair return. Even then the rate which the company will have to pay for money will be comparatively at least as high as that demanded for other forms of investment.

San Francisco's Municipal Railway

Before Pacific Railway Club, M. M. O'Shaughnessy, the Engineer of the City, Traces the Development and Outlines the Problems of the Local Civic System

ON FEB. 9, 1921, M. M. O'Shaughnessy, city engineer of San Francisco, Cal., addressed the Pacific Railway Club on the local transit situation, with particular reference to the city-owned and operated lines, which he said were the only municipally owned lines in the United States which are operating successfully. Some of his remarks are summarized below.

The people of San Francisco, in the charter of 1900, declared for public ownership of public utilities, the difficulty of successful competitive operation of the railway lines having proved a dominating reason for the decision to dispense with private ownership. After three elections $2,000,000 in bonds were voted for the Geary Street electrification in 1909, but little work was done in the following two years. The speaker's connection with the enterprise began Sept. 1, 1912. The road was opened for operation on Dec. 28, 1912, from Kearny Street as far west as Thirty-third Avenue and to Golden Gate Park. It was gradually extended until in July, 1913, the Geary Street cars were able to go clear to the ferry and out to the ocean. San Francisco then rested on its achievements in municipal ownership until 1914, when the problem of transportation for the Panama-Pacific Exposition came up.

As the United Railroads' franchises were soon to expire the private company was not inclined to make further investments and the task devolved upon the city. Its engineering department attacked the problem and designed an improved type of car which was a ton lighter than the earlier cars and saved the city $125,000 on 125 cars. Construction on Van Ness Avenue was started in the spring of 1914 and the line to the Exposition was completed in five months. The municipal lines, with the help given by the United Railroads, handled the Exposition crowds without discomfort. Out of the $3,500,000 bond issue voted Aug. 26, 1913, three other lines were built, one on California Street to Lincoln Park, another on Potrero Avenue to Twenty-fifth Street and the third to Church Street in the Mission. In 1915 the completion of the Church Street line was proceeded with, after considerable controversy as to route and other details. Next the problem was to get down to Market Street to carry the people home. After considerable litigation with the United Railroads the right of the city to build tracks wherever it chose on the streets was established and the Church Street line was finally continued to the ferry.

The next extension was out Market Street through the Twin Peaks tunnel, which was 12,000 ft. long, had cost $4,000,000 and had been constructed to give rapid transit to residents beyond Twin Peaks. This tunnel had been a possibility because the people beyond the hill were willing to pay an assessment of $3,000,000, or $1,000 per acre, to get direct transportation between the city and their homes. Although a logical solution of the problem would have been to allow the United Railroad to route cars through the tunnel, the people opposed this and the Municipal Railway lines were extended at a cost of $300,000. At first this was a profitless extension, but it is now paying operating expenses.

As to the objection to four tracks on Market Street, if these were not there a subway would be necessary, at a cost (for a two-track subway) of $12,000,000 for the three miles of the street.

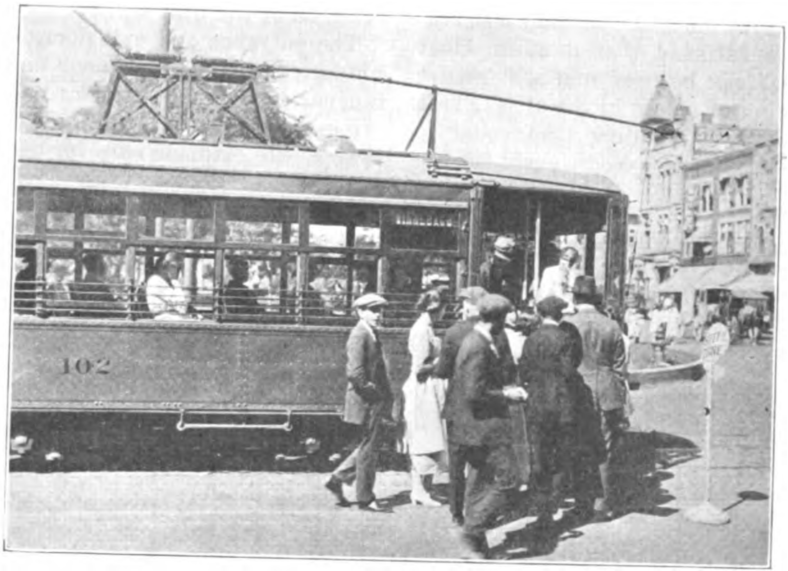
Mr. O'Shaughnessy said in conclusion that the Municipal Railway is on a sound financial basis. Since operations were started in 1913 gross revenues have amounted to $15,078,000 and operating expenditures $9,561,000. From the beginning the total disbursements have been $12,895,000. Interest amounting to $1,642,000 has been paid out of earnings. Of the $5,500,000 in bonds issued $899,300 has been redeemed and extensions and betterments have been made, including 27 miles beyond the original 45 miles, at a cost of $1,188,150. Fourteen per cent of gross receipts is set aside for depreciation and 4 per cent for damages and accidents.

The most harmonious relations exist between the city's operating department and the United Railroads in the way of crossings and other matters. San Francisco is now well supplied with railways, of which 288 miles belong to the United Railroads, 62 miles to the city and 10 miles to the California Street Cable Line. This is a mile of track to each 14,000 people. The combined earnings are $12,100,000 per year, which is a large total for a city of 39,000 acres area and 508,000 population.

"Selling" the Safety Car in Madison

Standard One-Man Cars Were Tried, to Which the Public Took a Dislike, and They Were Replaced by Double-Door Cars, Whereby Public Approval Was Gained—Results that Were Obtained Justify the Use of This Type of Car for This Service

DURING the war the Madison (Wis.) Railway purchased and placed in operation five standard one-man safety cars, in order to try out this type of equipment as a means of improving the service rendered and at the same time to take advantage of the economies thus made available. They were in operation for many months and gave satisfactory service except for the fact that there was manifest a distinct public dislike for the little cars, a dislike which seemed to center in the criticism, applied particularly to the rush-hour congestion, that it was necessary for boarding passengers to await the exit of leaving passengers before they could get on, and that the narrow aisle made it difficult to pass passengers standing in the aisle, and hence they would refuse to go back in the car to make room at the entrance. A glance back at the equipment used in Madison up to this time may serve to explain these criticisms of the riding public. Due to the location of the city on a long, narrow strip of land lying between Lakes Menona and Mendota, giving the city an 8-mile length, with the business district located at about the center of it, the Madison Railway enjoys a volume of patronage unusual for a city of but 40,000 population. Of this, more than half is carried on the cars each day. Unlike most companies operating in the smaller cities, this one had never made the mistake of going to the large, heavy double-truck type of car. So the advent of the safety car presented no appearance of tending back to former practices—a poorly founded criticism that has often been heard in other cities. But while accustomed to single-truck cars, Madison people had been educated to a double-end two-man car with rear entrance and front exit, closed vestibules, roomy platforms, 28-in. aisle and generous seat dimensions and spacing. The seating capacity of these cars was thirty-two and their weight 23,500 lb. Their design was the result of a number of years of study and observation on the part of F. W. and Dudley Montgomery, respectively president and vice-president and operating heads of the property. These cars proved so eminently satisfactory to both the company and the patrons that it was only natural, later on, when the safety car was the subject of special study, that an effort should be made to incorporate some of the desirable features of this car into the new one-man car.



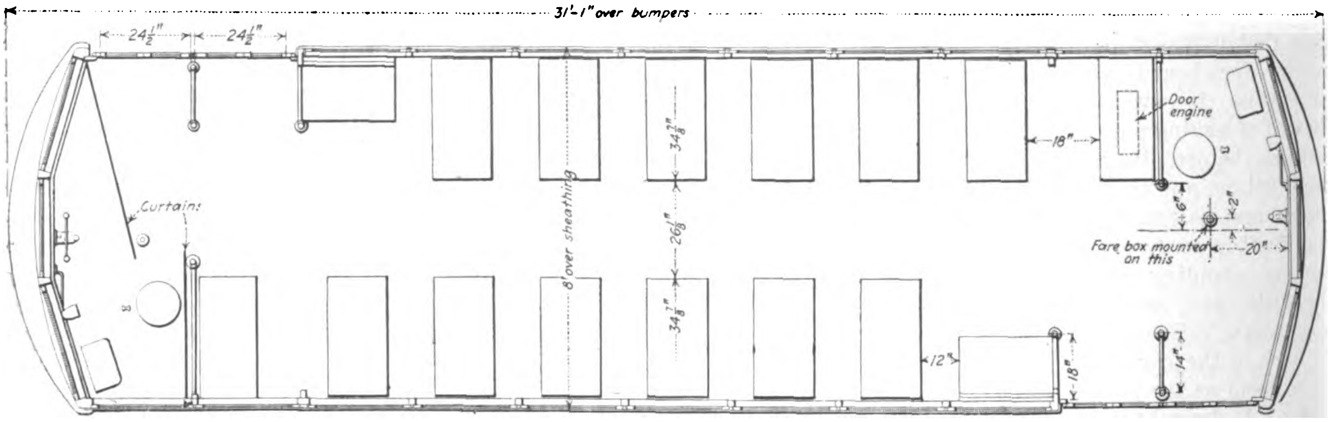
SIMULTANEOUS LOADING AND UNLOADING OF SAFETY CARS IN MADISON, WIS.

The situation was brought to a head in 1919 when the company asked authority of the Wisconsin Railroad Commission to purchase fifteen additional standard safety cars. The Madison City Council thereupon voted eighteen to one against the installation of any more cars of this type, and the commission refused to grant the request. So the company set out to see what could be done toward producing a car that would be acceptable to the public and still retain as many of the features of the standard safety car as possible. In other words, it was the aim to get a design of car manufactured that could be "sold" to the public of Madison as well as to the company. After unsuccessful negotiation with one or two car builders, Dudley Montgomery went to Philadelphia and finally induced the J. G. Brill Company to accommodate him by building eight safety cars according to his specifications. The accompanying floor plan shows the principal dimensions and layout of the cars built. The main points in which the Madison car departs from the standard safety car are that it is 2 ft. 3½ in. longer; 4 in. wider over the side sills, which is utilized to give an aisle 4 in. wider; a separate exit and entrance passageway, each 24½ in. wide, instead of one door 30 in. wide; that it weighs approximately 2,600 lb. more than the original safety cars used in Madison which are similarly equipped and finished, and involves a cost of approximately $600 per car in excess of the then price of the standard car. The exact scale weights on the eight cars upon receipt in Madison on Sept. 1, 1920, were 17,085 lb., 17,165 lb., 17,145 lb., 17,205 lb., 17,105 lb., 17,125 lb., 17,125 lb., and 17,100 lb., to which a slight amount has since been added on account of the exchange of the form-fit springless seats for cushion seats, so that the average weight will now run very close to 17,200 lb. A relative idea of the principal dimensions of the Madison car as compared with those of the standard Birney type of car is readily gleaned from the following data:

	Madison Car	Standard Car
Length over all	30 ft. 1 in.	27 ft. 9½ in.
Length over corner posts	16 ft. 10¼ in.	17 ft. 9½ in.
Length of platform	5 ft. 11 in.	4 ft. 4¼ in.
Width over side girder plates	8 ft. 0 in.	7 ft. 8 in.
Width of aisle	26 in.	22 in.
Door opening (clear)	24½ in. (two)	30 in.
Seating capacity	31	32

Aside from these few differences in body design, the Madison car in other respects is the standard car, except for what slight strengthening was necessary in the structural design of the body to provide for the additional width and length. The truck is the standard Brill 79-E type without a change, and the motors are the G. E. 264 type. In other words, Mr. Montgomery adhered to the standard design just as far as was possible and incorporated the double door and wider aisle. He reports that no motor trouble whatever has developed in the first five months of service because of the heavier load carried.

A particular feature claimed for the layout of the car is that the wider aisle and large amount of standing room at the rear induces people to move back in the car and avoids the front end congestion, which seems to have been one of the principal difficulties with the standard car in Madison. As the result of long observation, Mr. Montgomery is satisfied that a 26-in. clear aisle is the minimum that can be used and still secure a not uncomfortable passing of riders in the aisle. This new car will readily handle a standing load equal to the seated load and do it just as expeditiously as the former standard-type single-truck car operated by two men. Mr. Montgomery says that if the safety car is loaded beyond this amount, that is, beyond sixty people, there is a slowing up, and it can be noticed that the two-man roomier car, under such heavy overload conditions, will handle the crowd a little faster.



FLOOR PLAN OF THE DOUBLE-DOOR ONE-MAN SAFETY CAR BUILT FOR MADISON, WIS., AND LANCASTER, PA.

Certain other features have been included in these latest Madison cars which evidence Mr. Montgomery's ideas. He is very strongly of the opinion that the number of moving parts or fixtures in a car should be kept to the absolute minimum. Consequently, there are no folding seats in the vestibules; there is a permanently mounted operator's stool at each end, the one at the rear being often used by passengers; there are no curtains for side windows; the four ventilators are made with a fixed opening, with no adjustment, leaving no chance for trainmen to close the ventilator. The arrangement of the operator's curtains is also unique, consisting of two roll curtains located as seen in the floor plan of the car. The cars are built with double floors, Agasote side sheathing but no headlining (because Mr. Montgomery contends that this neither improves the heating nor muffles the noise) and Renitent patented brass side posts on account of the wind-proof fit of the windows and the ease of raising and lowering which he attributes to them.

The cars are equipped with twelve heater units, but these are not quite adequate, and a vestibule heater at each end is to be added. The average winter temperature in Madison is 27 deg. F. The aim is to provide heat enough at this outside temperature to give a car temperature of 50 or 51 deg. The trolley bridge is 16 in. higher than on the standard car and a pole 1 ft. longer is used. This combination is said to give better results in keeping the wheel on the wire on account of the smaller angle between pole and wire thus obtaining, which is effective in preventing jumping at points of high wire. Still another idea incorporated into the Madison car was the provision against freezing of the air system under the rather severe climatic conditions encountered. An unusual amount of cooling pipe, totaling 24 ft. to the wet tank and 30 ft. between this and the dry tank, was installed under the car floor. The running of the piping inside the car was thus avoided with apparent success, judging from the operating experience of the first winter.

The entrance and exit doors on the Madison cars are connected to the same door engine and operate simultaneously, as on the standard car. On four cars of the same design put through the Brill plant at the same time as the Madison cars for use in Lancaster, Pa., however, separate door engines were installed to operate the exit doors and controlled by a separate air valve placed within easy reach of the operator.

OPERATING RESULTS VERY SATISFACTORY

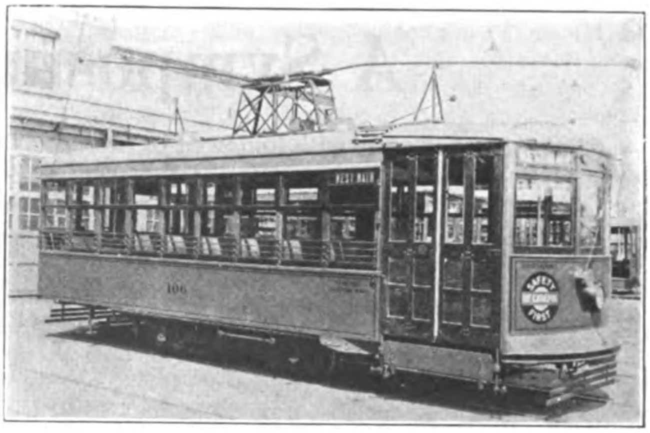
As to the operating results obtained with the double-door cars, the Madison operating officials are very enthusiastic. In matter of first consideration, the public has not only not criticised these new one-man safety cars with the double doors and wider aisles, but has given plenty of evidence of being pleased with them. A frequent comment made has been to question why the company did not get cars like these in the first place, the five standard cars having been disposed of by sale to another company when delivery of the others was made. There has also been manifest an appreciation of the evidence that the company had tried to give the people what they wanted.

The rush-hour period, of course, affords the best opportunity to observe the merit of the design. When a car pulls up to a corner on the State House Square and there is a group of twenty to thirty people waiting to board the car, it is noticeable how quickly the interchange of leaving and boarding passengers is completed and the car again on its way. Immediately upon the opening of the doors, the ingress of passengers begins through the forward or right-hand door, simultaneously with the egress of passengers through the left-hand passageway. The operator is thus busy collecting fares while the egress of passengers is taking place instead of standing idle during this period. As soon as all leaving passengers have alighted, the remaining boarding passengers get on at both entrance and exit. Those boarding at the exit door reach over and drop their fare in the box, if they have a ticket or exact change ready, and the speed of service is just that much ahead. Otherwise, they wait until the operator can give them change. No effort is made to prevent boarding at the exit door. Passengers are simply given the advantage of the extra space, and Mr. Montgomery says that the loss of fares from people slipping by without paying is so slight that it may be forgotten altogether. At least the loss attributable to the separate exit and entrance is so slight as compared to the benefits that it is worth little consideration. Passengers entering at the exit side must pass so close to the operator that he is easily able to control, reasonably well, any attempt at free riding. The speed of loading in Madison is also facilitated by a very general use of metal tokens, which sell at nine for 50 cents, while the cash fare is 6 cents.

DETAILS OF MADISON OPERATION

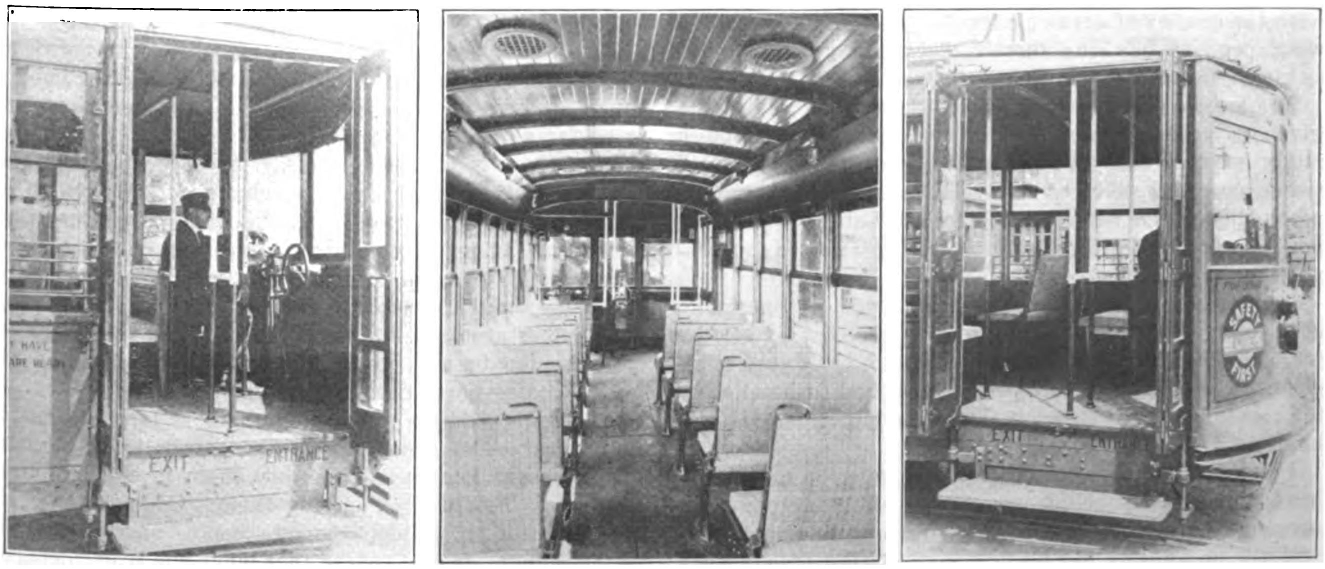
After the seats are filled, the generous amount of standing room at the rear of the car attracts the standees back there, so that the front well and aisle are kept open longer, and even when capacity load is reached, Mr. Montgomery points out, the 4-in. extra width in the aisle and the extra well space at the front make the task of getting through the standees from a point back in the car in order to get off a much easier one than was experienced with the 22-in. aisle cars. This fact is not without appreciation on the part of the public, for while people may not know that there is 4 in. more in the aisle, they do know that for some reason it is not so hard to get through the crowd in these cars when they wish to alight as it was in the former ones.

Thus, the two principal criticisms mentioned in the first paragraph are seemingly met and this may explain the favorable reception accorded the latest addition to the rolling stock of the Madison Railway. This is the answer to the problem with which the officials have had to deal and explains their enthusiastic indorsement of this particular design of one-man safety car.



THE 17,200-LB. MADISON SAFETY CAR, SHOWING SEPARATE EXIT AND ENTRANCE AND HIGH BRIDGE FOR TROLLEY MOUNTING

Just a brief summary of the service given in Madison may help in visualizing the conditions under which the safety cars are operated. They are not severe, in comparison with the requirements faced by many companies. The total system comprises three lines operating over 18 miles of track. All lines extend through the business district, at the center of which is the State Capitol, and into the residential district in both directions. All cars operate over the single-track loop around the State House Square, passing around a portion of the loop in one direction and the remainder on the return trip. The day schedule calls for nineteen cars, and six extra cars are used in the morning run and thirteen extra in the evening. The convergence of all three lines at the square gives a five-minute headway all day over this track, with a closer spacing in rush hours. The one-man cars are operated on any of the lines and interspersed with the two-man cars. Both the standard safety cars and double-door safety cars were installed in Madison on a car-for-car basis in replacing the two-man cars. The headway on all lines is ten minutes, both for two-man and one-man cars.



AT LEFT AND RIGHT, FRONT PLATFORM LAYOUT, SHOWING THE ARRANGEMENT OF STANCHIONS AND POSITION OF OPERATOR RELATIVE TO EXIT PASSAGEWAY. IN CENTER, INTERIOR OF MADISON CAR, SHOWING ABSENCE OF FOLDING PLATFORM SEATS, CURTAINS AND OTHER MOVABLE FIXTURES

A Symposium on Traffic

Sales Methods Must Be Followed to Increase Traffic, but They Must Be Accompanied by Good Service Through Close Co-operation Between the Transportation Department and the Traffic Department, so that the Public Will Be Satisfied with What It Buys—The Subject Is Considered from Four Standpoints

THE greater part of the session on Friday morning, Feb. 25, of the Toledo meeting of the Central Electric Railway Association was devoted to the subject of "Traffic." Four papers on this topic were presented, and there was also oral discussion. Abstracts of these four papers follow:

The Functions of a Traffic Department

BY BERT WEEDON
Traffic Manager Interstate Public Service Company, Indianapolis, Ind.

ONE of the greatest problems of the world has been traffic and transportation. This problem is yet far from being permanently solved, even with the new methods of transportation being perfected. One of the definitions of the word "traffic" is the business of transportation, as by railroad. It is this phase with which we have to do.

Years of experiment and study have developed highly efficient traffic departments in the transportation companies of this country. Commercial and manufacturing concerns, realizing the value, are also creating traffic departments of their own. The successful traffic man of this day must not only be a "hale fellow well met" but a diplomat, and have a fairly good working knowledge of commercial and transportation law.

The traffic manager of a railroad is the sales manager of that railroad. He is the man who meets the public, the newspapers and the various civic organizations in his territory. He has but one commodity to sell—service. His success depends, first, on his ability as a salesman to sell; second, the quality of the service to be sold; third, the amount he has to sell. He must know his competitors' service as well as his own. He must know that the price of his service is right, or in keeping with the quality of service offered. The public, on whom we depend to buy our service, does not question price as closely as it does the quality of the service.

The success of the traffic man depends on what he is given to sell. Among his many duties is a thorough study of the local situation, its requirements as to transportation service, its relation to the territory reached through connections, and the ability to serve, not only local territory but the region reached by connections.

A thorough study must also be made of operating costs to make rates in keeping with the cost of service maintained. It is an easy matter to build up gross earnings, but if the costs are 90 per cent to handle the business is it good judgment to solicit this class of business?

For the past three years all transportation companies have had all they could care for in all departments of service. We are now returning to a more normal basis and are up against the keenest competition of our lives. Our service must be of the best if we expect to get our share.

One phase of competition at present is the automobile truck as a common carrier. Many theoretical solutions have been offered, but few are of value. Good common horse sense is of the most use.

If the necessary electric railway transportation service to the welfare of a community is rendered and legislation enacted to require truck operators to help maintain the highways used and also to comply with carrier laws, as their electric railway competitors are required to do, there would be little trouble with this class of competition.

Then, too, the traffic and the transportation departments must co-operate to meet competitive service. The principal phases of our business today are passenger and freight transportation. Are we getting all the business along these lines that it is possible to secure?

MORE EFFICIENT SERVICE NEEDED

It would seem that rates and fares have reached their maximum. If so we must increase our volume of passengers and tonnage handled. This can best be done by more intensive development of existing lines in the way of more efficient service that gives: (1) Through passenger trains to more distant points on maintained schedules. A thorough study relative to the establishment of limited, local and suburban trains, to meet the requirements of the territory served. (2) Establishment of efficient local and through freight service package cars to more distant points. Establishment of carload commodity rates with especial solicitation of carload traffic.

Another phase of our business necessary for real success is publicity. Tell the public what is being done for its welfare, and why. Let it know the troubles, and why. Certain things it wants done cannot be done. Tell it why.

As a public servant we have a moral duty to perform. The welfare of the territory we serve is of vast importance and we should be interested in its development in so far as the law permits.

There was a time when a carrier corporation was a hated monster. That time has changed. The public is beginning to think those who have to do with the operation of a carrier company are almost human. Advantage should be taken of such a psychological moment. Publicity should be used to cultivate our patrons. Clear, clean-cut statements of facts concerning the business should educate and enlighten them and eliminate at least a major portion of any antagonistic feeling.

Adverse criticism and antagonism is largely due to ignorance. The American public is fair, and once our problems are known as we know them it will be quick to meet us half way in solving them. Co-operation and co-ordination of all departments means success for all departments. It also means that when the traffic department functions properly there will be black figures on the balance sheet.

Traffic from an Operating Viewpoint

By L. M. Brown

Superintendent Transportation Interstate Public Service Company

THERE is an evident lack of co-operation between departments when the traffic department agrees to furnish a service which the operating department cannot or does not perform. Such things have been known actually to occur, and if such a shortsighted policy is pursued it will seriously interfere with the reputation and business of any railroad.

To the operating department is assigned the duty of furnishing the service. The traffic department, no matter how competent, cannot succeed unless the operating department can deliver the goods. To give good service trains must be kept on schedule time, operated by employees who are competent and courteous and operated safely. To do this the necessary equipment must be provided. This equipment, together with the roadway and track and power equipment, must be kept in first-class operating condition and the operation must be supervised by some one who is capable of doing the right thing when emergencies arise. Personal attention must also be given by operating men in providing extra sections or trail cars for regular trains on days of heavy traffic.

Management Must Have the Confidence of Employees to Make Boosters of Them

The traffic manager and the operating man have to deal with a great number of complaints. If these are handled diplomatically and properly corrected friends can be made and the service improved. Most men are reasonable and fair when conditions are explained to them in the right way. The greatest available organization of boosters for any public utility is its own employees, and if the management is made up of men who have the complete confidence of the employees every man is a traffic man or a salesman and a booster for the company he represents.

Traffic men and operating men should be active in the civic bodies in the communities they serve. The value of the personal touch and contact with the leading men of a community is not only of great importance from a public relations standpoint but numerous ideas can be gained for increasing the business and for the betterment of the service.

I agree with the opinion that rates have reached their maximum and that as business returns to a normal basis we are facing keener competition than ever before. This means that the electric railway service must be improved if the interurbans are to get their portion of the business. Out of Indianapolis are now a number of fast limited electric trains. They render a real service, and the establishment of others to more distant points would no doubt attract additional passengers. Chair cars, dining cars and sleepers have been installed on some lines. There is no doubt that the short-haul riders are becoming fewer on interurban lines, due principally to the increased number of automobiles, and the best chances for increasing the passenger revenue seems to be in providing more limited or through trains, with every convenience and comfort provided on the steam lines.

With freight service the clamor now is for quick delivery. People like to buy one day and receive the shipment the morning following. Freight schedules must necessarily be revised to meet new conditions. If the road is large enough there should be local and through freight trains. The necessary equipment should be secured for the handling of large shipments and commodity rates established which will increase the car load business. Where freight stations are congested it may sometimes be possible to have shipments loaded directly in the car and changes or improvements made in schedules.

If we strive to give such service that the traveler will say when he travels, 'Let's go by traction; they are always on time," or when he ships his freight he will specify traction because they give the best service, the balance sheet will be satisfactory and the troubles of the traffic man and the operating man greatly relieved.

The Need for Personal Effort

By F. D. Norviel

General Passenger and Freight Agent Union Traction Company of Indiana

"TRANSPORTATION sales department" is a proper term for the traffic department of any electric line and one which is becoming very commonly used. The transportation salesman of a railroad is frequently not allowed the broad scope of initiative that makes for success in the industrial salesman, yet the commodity handled by him is probably one of the most important and necessary articles for the success of the business world.

If we had no competition the making of price marks and the display of our goods for sale could be handled from a clerical department, but unfortunately at the present time the electric lines are faced with probably the strongest competition ever encountered in the history of that service, and it means more than ever before the exploitation of the service that the company has to sell and a greater effort on the part of each individual department.

Auto Truck Competition Must Be Met by Decisions from a Study of Patrons' Wants

Observation has led me to conclude that rates can go no higher than they now are without a serious curtailment of traffic. There are two reasons for this: One is that other transportation means, such as the motor truck, giving a pick up and delivery service at rates lower than those now offered by the rail carriers, and another is the fact that the dollar is becoming more valuable and people are now counting pennies and nickels where they were thinking of quarters and half dollars just a short time ago.

Too much thought cannot be given to meeting the competition which we now have. The steam roads, with their immense and varied facilities, are very active. And then there is the motor truck, which is, in my opinion, our greatest competitor for the class of l.c.l. freight on which the electric lines have built up the considerable freight traffic they now haul. Thus the traffic man cannot confine himself to the office but must go out and meet his patrons face to face, study their wants and needs and endeavor to make the service he has to sell fit these conditions. He must gain the confidence of his prospective customers by making sure that his customers receive a satisfactory transportation service. This accomplished, the people and the industries will be offered to him in so far as his ability to serve has been perfected.

How to Increase Ticket Sales

By J. H. Crall
General Passenger and Freight Agent Terre Haute, Indianapolis & Eastern Traction Company

THE question of encouraging the purchase of tickets at stations instead of paying cash fares to conductors is a question undoubtedly worthy of consideration. This matter has been discussed by the Traffic Association at various times, but no concerted action has been taken to devise some method whereby we may get the money through the ticket windows and into the hands of the ticket agent. I believe there are several methods whereby we may successfully reduce the collection of cash fares on trains and increase the sale of tickets:

First, this may be done by penalizing the passenger 10 cents for each collection made by the conductor, as is done by the steam roads. This might be done by refunding the passenger this excess charge at any ticket office upon surrender of a cash fare receipt, but the plan to increase the sale of tickets would be more effective if the carrier would retain the excess charge. Such a method would be subject to the approval of the public service commission.

Second, a slight reduction may be made in the rate for a round trip. This plan is in effect on some of the interurban lines; the deduction is a certain per cent or a certain amount, usually 5 per cent or 5 cents for amounts from 25 cents to 50 cents and 10 cents for all amounts over 50 cents.

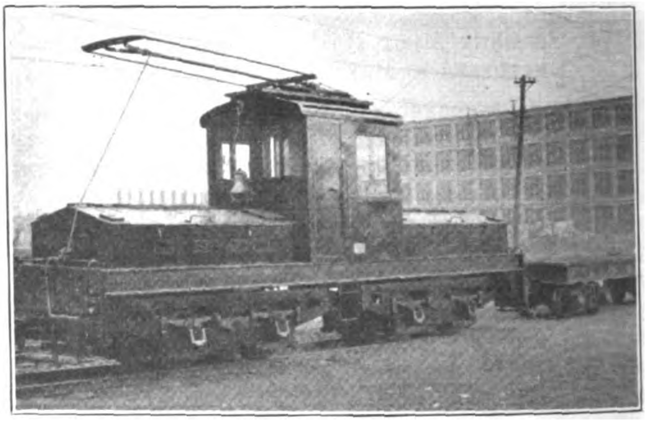
Third, another way of increasing the ticket sales is to appeal to the civic pride of the town served by the railroad. Most municipalities are apt to refer to the amount of business done by the railroad in their own town as a criterion of the prosperity of their community. I believe the traffic man should co-operate with the town boards and civic and commercial organizations in a campaign to encourage the purchase of tickets. A little advertising in the local papers and an attractive sign over the ticket agent's window reading "Boost Your Home Town by Buying Tickets," or "Buy Tickets Before Boarding Car," will help. And then do not fail to get your agent enthused, and see that he takes a pride in increasing the ticket sales and inject a little "pep" into the agent by showing that you have some yourself and you are sure to get results.

Super-Power Plant Plan for Indiana

FREDERICK L. RAY, superintendent of power plants Union Traction Company of Indiana, Anderson, Ind., recently read a paper before the Indiana Engineering Society in Indianapolis in which he outlined in a broad way the possibilities for economy and convervation of coal which would result from an abandonment of the nineteen small and largely inefficient power plants now operating in central Indiana and the building in their stead of two large modern power stations located at points of immediate coal and water supply and connected with the territory by high-tension lines. His estimate was that this would easily make a saving of nearly 50,000 tons of coal per month, or $150,000 per month. In a table presenting the operating efficiencies of the nineteen plants in this district, it was shown that the most efficient plant consumed coal at the rate of 3.20 lb. per kilowatt-hour, while the other plants ranged above this up to 9.66 lb. The proposed location for both power plants is on the Wabash River along the western boundary of the State, one north of Terre Haute in Vigo County and the other south of Terre Haute in Sullivan County, both of which are in the vicinity of the Indiana coal mines. A loop transmission system extending across the State would transmit the power generated at these plants to the entire central portion of Indiana.

Combination Storage Battery and Trolley Locomotive

TWO new type combination storage battery and trolley locomotives, made at the Erie plant of the General Electric Company, have been added recently to the equipment of the yard transportation department of the company at Schenectady. The new locomotives, which will be operated from a storage battery except in emergency cases, weigh 30 tons each and are the heaviest yet designed for the 36-in. narrow gage track. They are equipped with four HM-819, 250-volt motors. Braking is done with air, supplied by a motor driven air compressor of 16 cu.ft. per minute displacement. Air also operates the sander, bell and whistle. By the throw of a switch in the cab the locomotive is converted from a trolley to a storage battery type, drawing its power from a 96-cell, type MV-25 plate Exide-Ironclad battery.



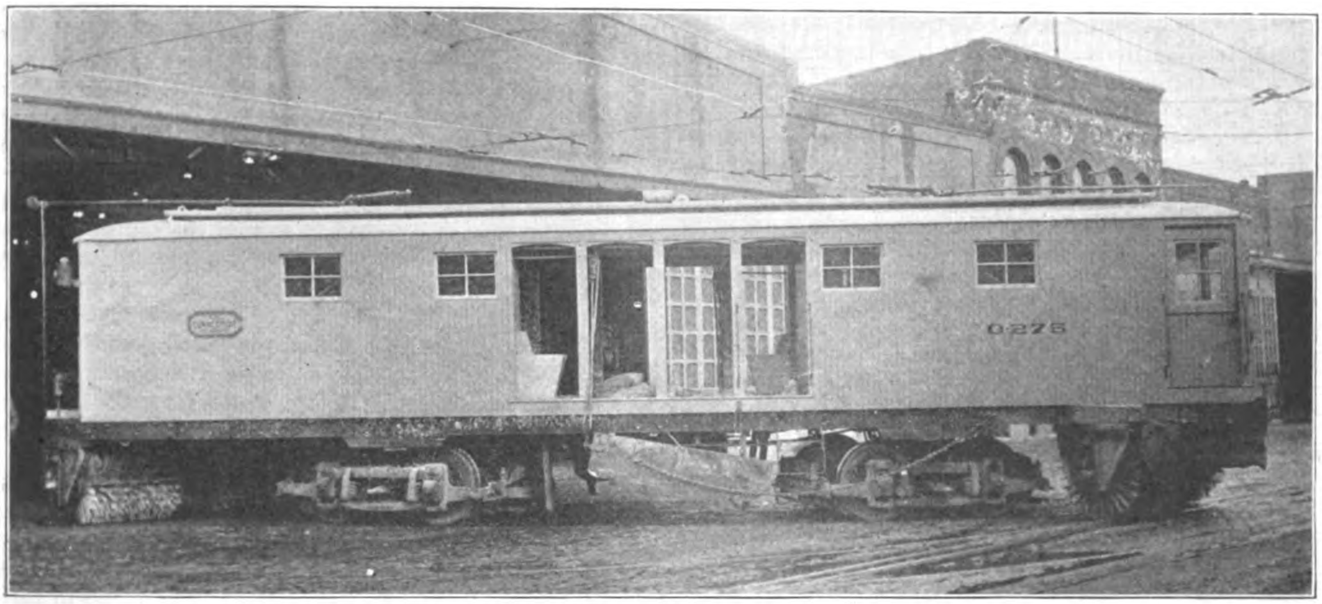
NEW TYPE COMBINATION STORAGE BATTERY AND TROLLEY LOCOMOTIVE FOR YARD TRANSPORTATION AT THE SCHENECTADY WORKS OF THE GENERAL ELECTRIC COMPANY

A big advantage of these locomotives over the straight trolley type is to be found in entering a building wired only to the door. With the old type it has been necessary to run a rope into the shop and attach it to the car or to place a hook with a lead onto the trolley wire and thus have a dangling wire supply the power while the locomotive goes inside. The storage battery type eliminates all this procedure and can operate anywhere the narrow gage tracks are to be found. A mechanical feature is the demountable steel tire. When the tire wears out eight bolts and a ring are removed, the old tire is taken off and a new one replaced.

In the illustration also can be seen a new type dump car being used. It carries standardized parts which eliminate the necessity for a large supply of special parts in making replacements or repairs, and had a 10-yd. capacity as compared with 4 yd. of the smaller type used. The new flat cars have a capacity of 100,000 lb. as compared with 10 tons of the older variety. This makes it possible to move any material manufactured or used within the plant.

Open Cars Changed to Snow Sweepers

The Connecticut Company Has Designed and Constructed in Its Own Shop Eight Sweepers from Obsolete Open Cars — Trouble Incident to Chain-Drive Sweepers Eliminated by Use of Gear Drive—Use of Old Material and Equipment Results in Low Cost



EIGHT OF THESE ON THE CONNECTICUT COMPANY'S LINES MAKE SHORT WORK OF SNOW REMOVAL

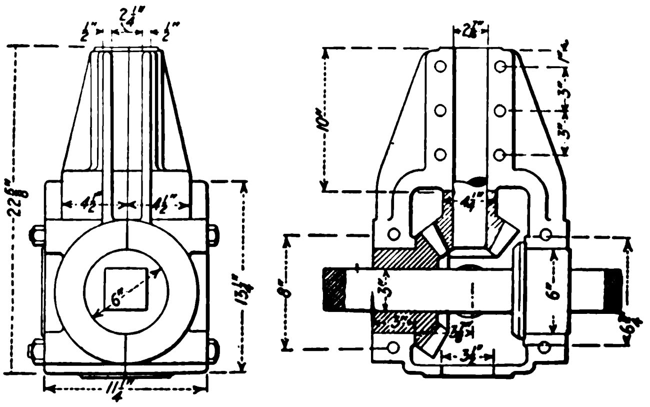
THE Connecticut Company has recently added to its snow-fighting equipment eight double-end rotary snow sweepers which were designed by its own engineers and constructed in its own shops at New Haven. Traffic delays following snowstorms have emphasized the necessity for equipment which would make short work of clearing the tracks, and the trouble experienced with chain-drive sweepers demanded that a more reliable construction be designed. The result has been that a very rugged, powerful and dependable sweeper has been produced. It is expected that these sweepers will be able to clear the tracks of light snow up to 12 in. in depth. For snows heavier than this, of course, a plow will be used, which, if need be, can be followed by a sweeper to complete the cleaning of the tracks.

At the present time sweepers have been allocated to the various parts of the Connecticut Company's system as follows: Three in New Haven, two in Hartford, two in Waterbury and one in Bridgeport.

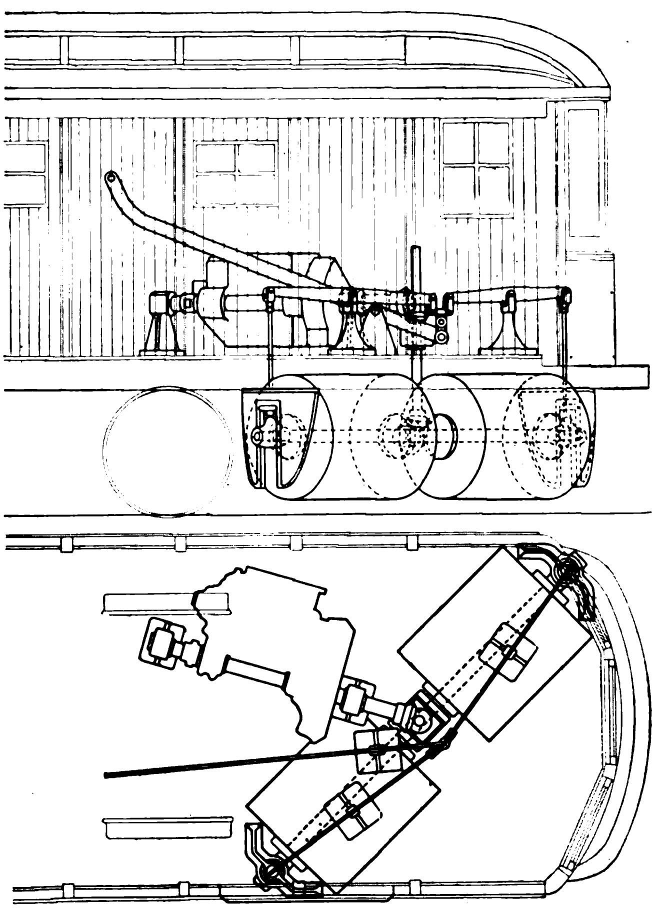
In order to utilize as much as possible the old equipment available, it was decided completely to rebuild eight double-truck, fifteen-bench open cars which survived their usefulness for passenger service. All of the cars were equipped with Brill 27-G trucks; seven of the cars had GE-67, 40-hp. motors with K-6 controllers and one car had GE-80, 45-hp. motors with K-35 controllers. Each piece of this equipment was thoroughly overhauled before being put in service again. All of the brooms are driven by GE-67 motors except one, which is driven by a Westinghouse-101 motor. K-10 controllers are used for the broom motors. All of these motors were also overhauled, some of them having been through a fire. Wherever possible use was made of old material in order to keep the cost to a minimum, and that they were successful in this respect is shown by the total cost of the eight sweepers being but $20,000.

CARS COMPLETELY REMODELED

To make room for a 34-in. broom at each end it was necessary to raise the body of the car about 10 in. and, at the same time, to shorten the wheelbase of the car from 25 ft. to 19 ft. 6 in. That the car might be able to pass under all bridges the monitor roof was done away with, which decreased overhead clearance by 10 in. The shortened wheelbase gives a long overhang and has made it impossible for the car to pass another on a curve. Both bulkheads have been removed and the ends totally inclosed. A space in the center corresponding to that formerly taken by four benches has been left open so that snow-fighting equipment and materials such as shovels, salt, etc., can be easily loaded and transported.



DETAILS OF BROOM SHAFT DRIVE JOURNALS



AN OUTLINE DIAGRAM SHOWING THE LAYOUT OF THE SWEEPER INSTALLATION

To strengthen the overhanging ends not only have the sills been strengthened but also an overtruss has been added on each side. Each truss is composed of a ¾-in. by 4-in. steel bar running between two queen posts over the bolsters and this strip is connected at each end with a 1-in. steel rod which goes through the ends of the sills. Also all stanchions have been strengthened by the addition of a wooden strip on each side.

Since plenty of space was available within the inclosed portion of the car all auxilliaries except the brake cylinder are removed from the under side of the car and are installed inside. This additional protection does its little bit to help eliminate any chance of failure and is quite essential because of the severe conditions to which everything beneath the car in proximity with a fastly revolving broom is subjected. The air compressor is placed in one corner on the floor; above it on a shelf is the governor, and above that strapped to the roof is the air reservoir. The grid resistors for the car motors are arranged in the corresponding corner of the other end in a vertical position and inclosed to prevent any one accidentally coming in contact with them. All wiring except the leads to the car motors is run along the roofs of the cars and thus protected from all injury.

Broom-Drive Construction

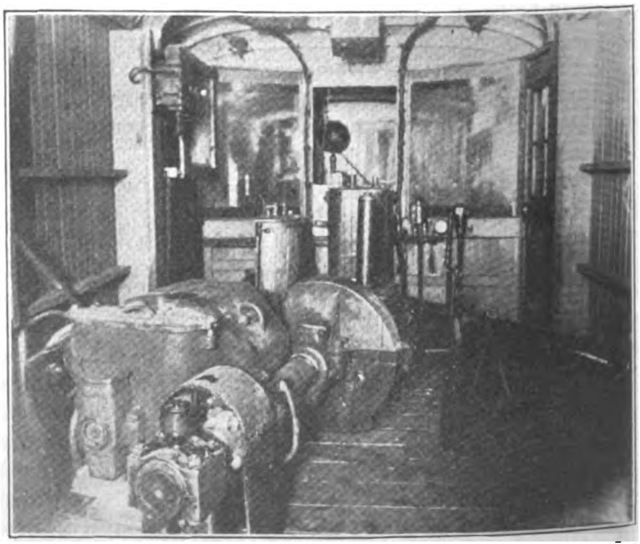
The rattan broom, which is at an angle of 45 deg. with the axis of the car, is supported from two jaws or pedestals. The one nearer the truck is supported from the car body, but the other one, which extends slightly beyond the end of the car, is supported by a channel iron running back into the car about 5 ft. and bolted through to the sill. These jaws act as a guide for the bearings at each end of the broom shaft. Except where the broom shaft enters the journals at the ends it is square and, accordingly, the broom itself is made in four sections and strapped to the shaft.

Now comes the novel part of this design. Instead of having a sprocket on the broom shaft and a chain running back into the car, the broom is driven through bevel gears from a vertical shaft. These gears are entirely inclosed by a cast-iron housing which acts as a case to hold the gears in line. The bevel gear on the broom shaft is made with a collar, which, with a similar collar on the other side of the housing, furnishes the bearing in the housing. On each end of the shaft next to the outside bearing is a thrust washer to take up the force acting along the shaft. The broom shaft is made from forged steel containing from 0.25 to 0.30 per cent carbon. A long bearing in the top of the housing supports the vertical shaft and the gear is held in line on the bottom by a collar on the gear itself and on the top by another collar. This housing is made tight and is completely packed with grease.

The broom motor, through bevel gears in a similar housing within the car, drives the vertical shaft, which is splined to allow the broom to be raised and lowered. Rods screwed into the broom shaft journals and connected within the car to a system of levers furnish the means for raising and lowering the broom. The working of this is shown in the accompanying cut. As originally designed, the two pedestals seen were lower and the toggle connecting the two levers was above instead of below the raising levers. This arrangement was found unsatisfactory, for when an attempt was made to raise the brooms by lifting up on the handle the toggle buckled. By placing a pin through holes in a V-shaped yoke in which the control lever works the broom can be held adjusted to any desired height.

The motor is supported by two pedestals, in which the shaft corresponding to the axle runs. The motor is held at the back by two smaller pedestals. In case it is found necessary to overhaul this motor it is necessary only to remove the bolts from the two rear pedestals and to turn the motor over on the driving shaft. A gear ratio of 22 to 62 is used. The broom runs at the same speed as the axle shaft, since the gear ratio of the upper bevel is 27 to 18 and that of the lower 18 to 27.

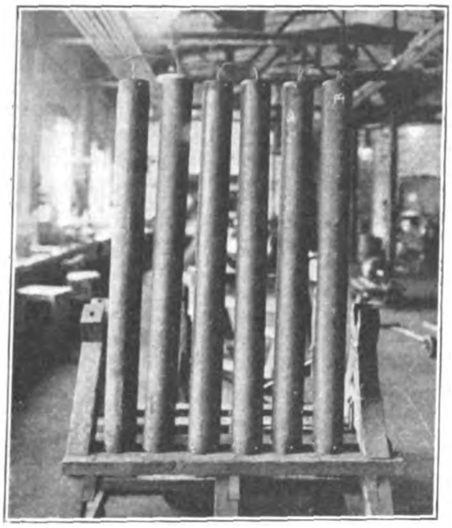
Obviously a very accurate control of the broom motor



INTERIOR VIEW OF CAB, SHOWING POSITION OF BROOM-DRIVE MOTOR, CONTROL, RESISTORS, ETC.

is desired so that it can be regulated according to the depth of snow and the speed of the car. This means that every point on the controller must be a running point. Instead of installing a great deal of capacity in resistors, a very simple method was resorted to. Discarded and wornout carbon brushes from car motors were packed into a fiber conduit tube about 3 in. in diameter and about 4 ft. long. Connection is made through a copper plate at each end, the upper held against the brushes by a spring. Six of these units are arranged vertically along the side of the car opposite the motorman. The controller for the broom motor is placed in the forward end of the car so that the operator has a good view of the roadway ahead.

Up to the present time there has not been a real snowstorm which would test these sweepers to their capacity. However, during a recent light fall of snow one sweeper in New Haven was operated continuously from 10 a.m. to 6 p.m. and performed in a perfectly satisfactory manner. The track and a space 10 in. on each side were swept clean of both snow and sand. It is felt by the designers that ample power has been provided for the brooms, and if there is any limiting feature it is the broom itself.



CARBON-PILE RESISTORS MADE FROM OLD MOTOR BRUSHES

The car is equipped with wings on both sides which can clear the roadway on either side of the car. Each is controlled by a block and tackle, the rope extending into the inclosed part of the car, so the wings can be easily drawn in to make room for passing vehicles and other cars. Sand boxes are provided in both ends of the car with a 3-in. pipe leading to the rail. There is also a salt box in each side in the open space so that no salt will be brought into contact with any of the equipment. Aprons extend down over the front of the car about half the diameter of the broom to prevent the snow from flying in the air too far. That some such precaution is warranted can easily be seen, when it is realized that the speed of the broom is about 350 r.p.m. Every effort has been exerted to have these sweepers as reliable and powerful as possible, for, like fire-fighting apparatus, when they are needed they are needed badly.

The machining of new parts and the overhauling of both the broom and car motors were done in the reclamation shops, while the rebuilding, painting, wiring and installation of the brooms and their driving motors were done in the Grand Avenue repair shops in New Haven, Conn.

The first order of eleven electric locomotives for the Swedish State Railways has recently been placed with the Motala-Lindholm works. These locomotives, to be delivered in 1922, will be used to haul iron ore on the Lulea-Gelivare line.

Association News

Shortage in Accounts Discovered

IN THE audit which was begun last week of the accounts of the American Electric Railway Association for the fiscal year of the association the auditors found some discrepancies in the accounts of William O. Gibson, bookkeeper, and President Gadsden was notified. A special meeting of the executive committee was called by Mr. Gadsden on Tuesday morning of this week, and on Wednesday Gibson was arrested. The audit is said to reveal irregularities in excess of $40,000, of which about one-fifth was in Liberty Bonds and the rest in cash. The alleged misappropriation occurred since the last audit. When Gibson was arraigned in court Mr. Gadsden said that he had made a confession. The particular charge against him was that on Jan. 18, 1921, he cashed an association voucher at the Guaranty Trust Company, stating that it was to pay an efficiency expert in the Washington office, when actually there was no such employee.

To aid in determining the extent of the discrepancy, all members of the association are being asked to advise the association of the date and amount of any remittances made for dues since November, 1919.

An adjourned meeting of the executive committee has been called by President Gadsden for March 15.

Out to Meet the Public

THE advertising section of the Bureau of Information and Service of the association has already begun to function in accordance with the platform adopted at the Chicago conference. It is now engaged in the preparation of publicity copy for use in selling the suggestions in the report of the Federal Electric Railways Commission to the public in the communities served by the trolley lines. Two cards have been sent out to member companies; one, 8⅝ x 13¼ in., displays a summary of the principal findings and recommendations of the commission, and is intended for display in public places, such as waiting rooms, carhouses, office windows and the like. The other is a desk card 4½ x 8½ in., which sets forth the remedies suggested by the commission for the betterment of conditions.

Loss of Creosote by Evaporation

THE amount of creosote lost through evaporation in open-tank treatments has been shown in experiments at the United States Forest Products Laboratory to be in proportion to the area of the exposed surface and the volatility of the oil.

Percentage of Oil Distilling Below 270 Deg. C.	Loss in Pounds per Square Foot per Day
20	1.0
30	1.4
40	2.0
50	3.0
60	4.3
70	6.3
80	9.3

At the treating temperature of 195 deg. F. the loss of creosote in pounds per day per square foot is as shown in the accompanying table.

Recent Happenings in Great Britain

Inquiry Into Tramway Wages Under Way—Through Bookings for Tramway and Omnibus in London

From Our Regular Correspondent

Much interest attaches to the inquiry which began in the end of January regarding the claim of the tramway employees of the country for an advance in wages of 12s. a week. It is the first inquiry of the sort which has taken place in connection with the industry, and whatever other result it may have it will elicit all the facts on both sides and make them public.

IN PREVIOUS articles I have traced the course of the dispute, in which the employers took up and adhered to the position that they could not pay more, as the industry was already run at a loss. Then the Minister of Labor constituted this Court of Inquiry under the industrial courts act, 1919, with instructions to inquire into the causes and circumstances of the dispute and to report thereon to the Minister. The court is composed of representatives of employers and employed and two outside members. What will happen after it has reported remains to be seen.

MEN'S CASE HEARD FIRST

At the hearings, which began on Jan. 26, parties were represented by prominent men in their own ranks, not by counsel. The case for the employees was taken first and lasted for several days. E. Bevin argued that higher wages were required to meet the high cost of living, and were still needed though the latter had begun to decline. The municipal tramway authorities had made large contributions to relief rates in prosperous times instead of accumulating the profits to meet lean times like the present. A wage to maintain a proper standard of living was insisted on in any circumstances. Mr. Bevin in conclusion referred to growing unemployment in industry and said that unemployment was brought about by the machinations of American and other financiers to enable them to lower the standard of living.

Witnesses representing the trade unions concerned were afterward heard, and subsequently the wives of some tramwaymen were called' and testified that the wages of their husbands were insufficient for the proper maintenance of their families.

RAILWAY BURDENS TOO GREAT

H. Gordon, a member of London County Council, was also called as a witness for the employees. He advanced the view that in calculating the commercial value of a tramway the local rates which had to be paid in respect to the track should be placed on the credit side. He considered that if tramways were properly managed and were not charged for street widenings and were freed from local rates on the tracks great prosperity was in store for them. The present condition of street traffic in London he described as chaotic and disgraceful. He said that £200,000 a year was wasted by time that is lost at London tramway deadends.

The Court sat for three days a week. It began the case for the employers on Feb. 2. J. H. Beckett, secretary of the Municipal Tramways Association, testified that owing to the financial loss the undertakings could not give the advance of wages asked for. He showed that on the undertakings of sixty-six authorities there had been a drop during the last sixteen weeks of 1920 of 8,000,000 passengers compared with the corresponding period of 1919. That arose from the slump in trade.

As to wages paid by tramways compared with those in other trades, he said that the tramway man could not be compared with a skilled mechanic who had to serve an apprenticeship. If 2½d. per mile run were allowed for renewals, then eighty municipal tramways in the year 1919-20 were carried on at a loss of £1,500,000. The people using the cars would not pay any more for fare than they were paying at present.

Mr. Beckett also mentioned that the forty-five municipal undertakings which had voted against arbitration represented 15,141 employees and the thiry-nine which voted for it represented 29,344. He opposed the suggestion that the voting should be by the number of employees. As to the charge on tramways for street widenings, the amount was small and confined mostly to London. Other witnesses were heard as to the deficit on tramway working, and on Feb. 4 the court adjourned till Feb. 15 in order that additional statistical information might be prepared and handed in.

It is of interest to note that in orders granted by the Minister of Transport to municipalities authorizing higher fares than the statutory maxima it is stipulated that the municipal tramway authority shall not make any payment out of the revenue of the undertaking to the credit of the borough fund or in relief of rates in any year until they have made reasonable provision for the proper repair, maintenance and renewal of the undertaking, and shall keep such accounts of their expenditure on repairs, maintenance and renewals and shall furnish such returns of the provision made by them and of their estimated future liability in respect thereof as the Minister of Transport may from time to time require. These seem very reasonable and proper conditions in the circumstances.

There are quite a good many municipal Tramway undertakings which in the days of prosperity paid large sums for the relief of the local rates. If that money had instead been accumulated, it would now be of much use.

The Glasgow tramway undertaking is beginning an experiment, to be continued till the end of the financial year (May 31), of running all-night cars for the benefit of late workers. The cars are to run on fifteen routes at hourly intervals on the outward journey from 12:30 to 3:30 a.m., and on the inward journey at 2 a.m. and 3 a.m. only. The fares on the average are about 50 per cent higher than the ordinary fares, and the minimum is 1d. for one mile. It is not expected that there will be any profit on these services, but rather a loss. Inquiries at London and Manchester, the only two places in Britain where all-night cars are run, show that these services are run at a loss. The loss, however, is small compared with the main revenue and expenditure. The Glasgow experiment covers more routes that the night cars do in either London or Manchester. In the matter of these night services, Glasgow is very far behind New York, as my recollection is that cable cars ran all night in Broadway at least twenty-five years ago.

TRACKLESS TROLLEYS MAY BE USED

In the stress of post-war conditions I see the possibility, in this country at any rate, of a new, though perhaps temporary application of the trackless trolley system. There is a proposal before Bradford Town Council to substitute trackless electric cars for the tramway cars on certain suburban routes where the rails are worn out. At present prices it would cost an enormous sum to renew the tracks, so it is thought the railless car might be put on for the present at least. The poles and overhead wires are there already, so all that would be required, after getting the cars, would be to put up negative trolley wires for the return. This course would seem preferable to installing the expensive petrol motor omnibus.

The Birmingham Town Council is considering the trackless car and inquiring into the Bradford experiment of using double-deck trackless cars. The Glasgow Town Council is looking into the question of using the trackless trolley system on suburban routes for which tramway extensions have been authorized but are held up owing to the cost of construction.

Application is to be made to Parliament in the ensuing session for sanction to two great water power schemes in the Highlands of Scotland. One, the Lochaber scheme, is for the purpose of producing electricity to be used mainly for the development of the manufacture of aluminum. The other, the Grampian scheme, promises to supply electricity for all purposes over a wide area including Perthshire and Forfarshire. Between the two something like 150,000 hp. will be developed. The water will be derived from locks and rivers situated at high altitudes among the mountains. Should these schemes be sanctioned, they may possibly lead by and by to the electrification of some steam railways.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Purchase Installment Paid

City of Seattle Meets Its Obligation, but Suit to Review Purchase Deal Goes Before Courts

The Puget Sound Power & Light Company has abandoned its motion for a temporary injunction against the city of Seattle and has thus simplified the preliminary proceedings in the United States District Court in the fight to prevent a review of the city's purchase of the Stone & Webster lines. The need for the temporary injunction was removed because the $375,000 due on March 1 on the $15,000,000 of utility bonds issued to Stone & Webster was paid. The company would enjoin the fourteen taxpayers from making Stone & Webster a party to the state court action, or taking action in any but the federal court to seek a review of the city's contract with Stone & Webster.

TAXPAYERS SUE CITY

The taxpayers have sued the city in the Superior Court, and Judge J. T. Ronald of that court, on Feb. 24, signed an order requiring the fourteen taxpayers to make Stone & Webster party defendants with the city if they take further action in the Superior Court. The taxpayers were granted a ten-day extension of time for filing an amended complaint in the suit.

Otto B. Rupp, counsel for the taxpayers, replied to Stone & Webster attorneys with the assertion that the company's move simply was an attempt to enjoin a proceeding in another court, and with the declaration that the taxpayers in no way sought to force a breach of the contract under which the city paid $15,000,000 for the railway system. He asserted the federal court had no power to restrain the Superior Court proceedings, and declared there was absolutely no necessity for bringing the company into the state courts.

SUIT BROUGHT TO RESTRAIN CITY

Attorney James B. Howe, for the Stone & Webster Company, said the taxpayers' suit virtually was an action to restrain the city from complying with a contract upheld by the Supreme Court. He argued that jurisdiction was acquired by the federal court through failure of the taxpayers to make the company a co-defendant, and the case should proceed to final adjudication in the United States court, which could enjoin any action that would prevent it from granting the relief asked. He said the city wanted to fulfill the contract, and denied the right of taxpayers to interfere.

Judges Neterer and Cushman arranged to hear the case together, each applying such part of the argument as concerned his case, and although the motion for a restraining order against the city was dropped, the two judges continued to hear the arguments on the second case against the fourteen taxpayers.

At the close of the arguments on the suit Federal Judges Neterer and Cushman granted permission to the fourteen taxpayers to file an amended complaint in the King County Superior Court. The modification of the federal court's restraining order, made at the request of counsel for the taxpayers, and over the objections of the company, carried the stipulation that the Superior Court proceedings should go no further pending the federal court's decision on the arguments heard to date. The judges indicated they would hand down their rulings on March 14, and ordered the modified restraining order continued until that date.

No Profits to Share in Virginia

After a six months' trial the profit-sharing plan announced last summer by the Virginia Railway & Power Company, Richmond, Va., has been withdrawn, the operations for the six-month period having demonstrated that there were in fact no profits to share. In announcing the plan on Aug. 15, 1920, Thomas S. Wheelwright, president of the company, said that profit sharing must not be confused with a bonus payment. The operation of the plan was described at that time in the ELECTRIC RAILWAY JOURNAL.

The profit-sharing plan was withdrawn by order of the directors as of Jan. 31, 1920, because there was no surplus to divide. The figures for the six months ended Dec. 31, 1920, which would have been the basis for profit sharing during the next six months, showed a deficit of $37,550, instead of a surplus. A decrease in the number of passengers carried as compared with the same period of 1919 is also noted in the report.

In the strict meaning of the term, "profit sharing" includes sharing in any deficits as well, but no such provision having been made in the plan as originally adopted, it is merely withdrawn and the company will "go it" alone on the deficit.

The importance of the closest co-operation for increasing earnings and economizing in expenditures is being urged by company officials. The company points out that the fact that there is no surplus to divide is not due to any defect in the plan, which was dependent upon the closest co-operation for economy, increased business, fewer accidents and more perfect fare collections.

Relief Recommended

Committee of Green Bay Citizens Favors Relieving Company of Paving Costs

A committee of citizens of Green Bay, Wis., has submitted a conclusive report on the traction problem in that city to the City Council. Some eight months ago this committee was created in the hope of promoting improvements and extensions which at a later date were substantially covered in a proposed ordinance presented to the City Council by the Wisconsin Public Service Company, which operates in Green Bay.

The committee in submitting its report, which contains some modifications of the ordinance drafted by the railway, states that its recommendations are offered with a desire to harmonize the interests of the company and the city in order that Green Bay may expand. It believes that better railway service can be brought about through public co-operation which will ultimately mean profitable operation.

The committee favored a service-at-cost arrangement, but the adoption of a grant of this kind for the immediate present was not considered.

COMMITTEE RECOMMENDS RELIEF

The committee and the railway are in accord with respect to improvements which will serve the city's requirements and assist in its growth, such improvements being provided "on conditions which will invite additional investment." Through the Smith & Scheuring Audit Company the committee made an inspection of the company's books and for the six months period audited the Wisconsin Public Service Company failed by $18,000 to earn interest, with nothing provided for dividends.

In view of these facts the committee agrees that some of the concessions asked for by the railway looking toward a reduction in cost should be granted. One important provision of the ordinance dealt with the request of the company to be relieved of the obligation of paving, repaving or repairing any portion of any street in the city. With respect to this matter the committee reports paving obligations have become a real factor in the traction problem.

The committee believes that the attitude of the city toward a public utility question of this kind should be judged in accordance with its effect upon public interest. The committee concludes that as a matter of fairness and for the promotion of sound traction development in Green Bay the company's application to be relieved of paving cost

ought to be granted and the committee would so recommend. With respect to maintenance cost it is the opinion of the committee that the company should continue to pay for repairs to all paving where the tracks of the railway do not rest upon permanent foundations and that where permanent foundations are laid or may be laid in the future it be relieved of maintenance.

Public Control Act Upheld

The Supreme Court of Massachusetts has sustained the constitutionality of the statute under which the Boston (Mass.) Elevated Railway Company is being operated by a Public Board of Trustees with the return on investment guaranteed by the State for a period of ten years from 1918. The city of Boston brought suit to recover from the trustees $2,905,931 which had been assessed on it, as its share of the Elevated's deficit for the year ended June 30, 1919, in accordance with the terms of the statute. Counsel for the city attacked the law as unconstitutional, but this last decision of the Supreme Court seems to assure the company of comparative security for its investment for the balance of the ten-year period.

The bill filed alleged that in ascertaining the deficit of $4,000,000 the trustees charged for the fiscal year ended June 30, 1919, depreciation of approximately $2,000,000, and $2,300,000 for maintenance and repairs; that the average charged by the Boston Elevated Railway for depreciation for the ten years prior thereto had been about $98,000 each year and was inadequate, in consequence whereof the property had run down and was badly depreciated; that the amounts charged are "excessive, unreasonable and unnecessary," and that if the assessment of the deficit was made according to the act the plaintiff, as one of the cities liable, would be called upon to pay a very large proportion of the sum to be paid by the commonwealth to the railway.

ACT APPROVED

The Supreme Court in its finding said:

> In essence, this act having been accepted by the railway companies, constitutes an agreement between the Boston Elevated Railway and the Commonwealth, that the latter shall take over the management and operation of the railway and shall pay therefor the amounts specified in way of compensation for the use thereof. The public operation is undertaken by the Commonwealth, not as a source of profit, but solely for the general welfare. The main design of the act is public operation at such rates of fare to be fixed by the trustees from time to time as shall afford revenues sufficient to defray all charges and the dividends established by the act.
>
> There is no distinction in principle between the management and operation of such a transportation system by a public agency established by the Legislature and the taking over by counties, cities and towns of toll bridges and turnpikes, originally private enterprises. It has been held that public ownership and operation of a ferry constructed at public expense for the uses of a street railway of the Boston Subway all are valid under the constitution.

Both Sides See Victory Ahead

City of Detroit Elated at Supreme Court Ruling—D. U. R. Sees More Need than Ever for Service-at-Cost

The decision of the United States Supreme Court handed down on Feb. 28 clarifies the street railway situation in Detroit greatly, sustaining the action of Federal Judge Tuttle in denying an injunction asked by the Detroit United Railway restraining construction of the Detroit Municipal Street Railway. In this decision the court considered both the validity of the election in Detroit and also whether the method proposed by the city would be a deprivation of the railway's property rights without due process of law, in violation of the fourteenth amendment of the Constitution.

THE Fort Street decision is reaffirmed wherein it was held that a street railway which is operating under a franchise granted for a definite period and has enjoyed the full term of the grant could be required within a reasonable time to remove its tracks and other property from the streets upon failure of renewal of the grant, and it declares that the so-called day-to-day arrangement or the expenditure by the company of large sums of money on its property with the knowledge and acquiescence of the city did not affect this right.

CORPORATION COUNSEL EXPRESSES VIEW

The charge was made by the company that the city officials were engaged in a scheme to compel the company to part with its property at a sum much less than its fair value, but the court held that the city has the right to acquire the property on the best terms it can make with the company, and an attempt to buy the property at much less than its value would not deprive the company of property without due process of law. Moreover, the court said under the Constitution of Michigan no city or village can grant any public utility franchise which is not subject to revocation at the will of the city or village, unless such proposition shall first have the affirmative vote of three-fifths of the electors, so that the city could not effect any purchase without such approval. In fact there is nothing in the ordinance attacked which undertakes to acquire the property of the complainant without compliance with this charter provision. Finally, the court declared that the form of submission of the question was in substantial compliance with the law. This makes it mandatory for the Street Railway Commission to proceed to acquire a municipal street railway system and as soon as possible make the municipal system exclusive.

According to Corporation Counsel Wilcox the Supreme Court decision answers all the claims of the Detroit United Railway that have crept into the conferences between the city and the company, and also establishes the fact that there is no such thing as a franchise by estoppel as proposed by Charles Evans Hughes in his argument for the Detroit United Railway. The decision, Mr. Wilcox states, meets the primary contentions of the Detroit United Railway in all its other suits against the city filed since April 5, 1920, and also that in the suit of the Clairmount residents, decision in which was for the city. The city officials consider the decision the most important one ever obtained by the city in court and believes that, coming from the highest tribunal in the country, there can be no appeal from it.

Commenting on the Supreme Court's decision Elliott G. Stevenson, attorney for the Detroit United Railway, stated that the people have the matter of settlement in their own hands and can decide to have continued service under what is universally conceded to be the fairest ordinance ever submitted to the people of Detroit or any other city—or they can decide to go without service as far as the company's lines are concerned. It was cited that in 1918 the Council instructed the Corporation Counsel to commence proceedings to oust the company from the streets on which franchises have expired. This question is now before the Michigan Supreme Court.

COMPANY'S POSITION OUTLINED

The decision, according to Mr. Stevenson, states that if the people of Detroit desire to have the service of the Detroit United Railway stopped, its tracks torn up and junked, and so express themselves in a proper way—at an election at which the question is submitted—it is within their power to bring about that result. Also that the municipal ownership plan submitted by Mayor Couzens a year ago is valid. Further, that as the city, speaking through the people, has the power to stop service and have the railway company's property removed the company likewise has the right to stop service at any time it sees fit.

That the Detroit United Railway is not making any threats of trying the so-called "Toledo treatment," as has been implied, is best shown, Mr. Stevenson says, by the fact that the company is contending that ouster by resolution is not legal, but that if such proceedings are to be taken and service is to be stopped it must be done by ordinance so that the people themselves, vitally interested in the matter, can have the right to affirm or reject through a vote under an initiative petition. He thinks the situation, now most acute, could readily be settled by the adoption of the proposed service-at-cost ordinance which the company has offered to accept. This ordinance will come up for ratification at the polls in April.

M. O. a Success

New York's Commissioner of Plant and Structures Says So Himself of Staten Island Lines

Grover A. Whalen, Commissioner of Plant and Structures of the city of New York, is claiming success for municipal ownership of the Staten Island trolleys on the basis of the three months of operation from Dec. 1, 1920, to March 1, 1921. He says the figures for the period will show that every expense was covered by receipts during a season when traffic was at its lowest ebb, and that the experiment on Staten Island has vindicated the city's claim that a transit line can be operated successfully on a 5-cent fare.

The city took over the Staten Island Midland Railway Company on Dec. 1, after it had gone into bankruptcy because an increased fare was not allowed, with the provision that the city should pay for all operating expenses and in event of profits being made that they should be divided fifty-fifty with the receivers.

Mr. Whalen is quoted as follows:

> By spring the city will be operating not only the Staten Island trolley lines and the Williamsburg Bridge local line but also the New York & North Shore lines, service on which was suspended more than a year ago. The city is now negotiating with Federal Judge Chatfield, who appointed the receiver for the North Shore lines, for an agreement similar to the one entered into with the city regarding the trolley lines of Staten Island. I have every reason to believe that the court will allow the city to operate the North Shore lines on the same conditions.
>
> We have carried 20,000 passengers daily, and that is the lowest average of the year. In the summer we expect to be carrying 100,000 or 150,000 a day. We have given better service than the Staten Island Midland Railway, and that is, I believe, an important reason for our success.
>
> But for the intelligent view which Judge Chatfield took of the hopeless transit situation confronting the people of Staten Island, and his broad-minded co-operation with the city in its endeavor to apply a remedy, municipal operation of the lines in question would have been impossible. He gave the city an opportunity to show that it is capable of operating transit lines and give good service at a 5-cent fare, which our predecessors had declared impossible.

The investment of the city in the Staten Island trolley system for cars amounts to $194,000 up to date, according to Commissioner Whalen, but more cars will have to be purchased in the spring to meet the demand of the summer traffic. Mr. Whalen intends to acquire a number of second-hand cars.

Merchants at Akron Urge Franchise Revision

The Retail Merchants' Association of Akron, Ohio, has taken a hand in an effort to settle the traction problem in that city. Resolutions have been unanimously adopted and presented to the City Council urging the Council to take immediate action. The Akron Rotary Club, Kiwanis, Gyro, Exchange and Lions Clubs of the city have taken similar action and a concerted movement is on to enforce settlement.

The move to settle the controversy was started by Jerome Dauby, general manager of the M. O'Neil Company, one of the largest department stores in the city.

As pointed out in the ELECTRIC RAILWAY JOURNAL recently, the people of Akron are demanding an extension and development of the city system. The Northern Ohio Traction & Light Company has taken the position that extensions and development cannot be made until the system shows earnings sufficient to borrow the money and that it would be impossible under the proposed franchise to secure the funds necessary for this purpose.

Conciliatory Attitude Now in Detroit on Crossings

Petitions have been filed by the Detroit United Railway in the Circuit Court asking that six Detroit city officials who are held responsible for the forced crossing on Jan. 9 of the Detroit United Railway's Mack Avenue line by the city's St. Jean line be adjudged in contempt of court and punished for violation of the injunction issued by Judge Dingeman forbidding the crossing.

Announcement was later made by the company in a letter to the Corporation Counsel that the crossing of the D. U. R.'s tracks by the city lines will not be opposed provided the work is properly carried out and that plans therefor are previously approved by the company. The company's action in permitting crossings does not affect the status of the controversy relative to the Mack-St. Jean crossing. The injunction obtained against the city will not be waived and the contempt charges against the city officials will not be withdrawn. It is not the intention of the company to waive any of its legal rights.

It has been intimated by Detroit United Railway officials that permission would have been granted the city to make the crossing at Mack Avenue if plans for the crossing had been submitted to the company and had met with approval. The company's attorney stated that it was not proposed to prevent crossing of the company's tracks by the municipal railway if the city has the right to construct and operate a railway system under the proceedings taken, but it is insisted that the crossings shall be done in an orderly way and only after plans for the work have been considered and approved by both parties concerned.

The company further states it may be that it would prefer when the plan shall have been approved for a crossing, that the installation be made by the Detroit United Railway so that interference to traffic may be reduced as much as possible. This, however, is a detail that can no doubt be arranged satisfactorily. The installation of crossings now sought to be made is to be carried out with the understanding that the company's claims to lawful rights shall not be prejudiced.

The engineers for the Street Railway Commission plan soon to submit blueprints for a number of crossings according to Joseph S. Goodwin, general manager of the municipal lines.

Loss Is $93,000 a Month

Service-at-Cost at Toledo Ushered in at Bad Time, but Commissioners Are Hopeful

Commissioner Wilfred E. Cann has reported to the Board of Control at Toledo, Ohio, that the Community Traction Company is running behind in its operating expenses at a rate of $93,000 a month, considering the payments to be made to various funds for maintenance, betterments, interest and sinking fund.

A full report also showed that nearly 100 jitney buses are carrying 12,000 or more passengers daily in direct competition with the railway on choicest routes and at peak hours.

The board immediately drafted a letter to the Council and recommended drastic regulation of the jitney competition. The matter is now in committee and the law director is working on a bill to be patterned after the Cleveland regulatory legislation.

The railway last year paid in taxes and license fees an amount equal to $800 for each one of the cars which it operates.

The matter of power contracts was also taken up by the Board of Control at its meeting. The members hope to be able to make a contract between the Community Traction Company and the Toledo Railways & Light Company or Acme Power Company which will put city street lighting and railway power on the same basis or make a joint proposition out of all power bought by the city.

A ninety-day period is allowed under the new franchise for making interurban contracts. Mr. Cann favors a contract based upon car mileage while President Coates of the Community Traction Company favors a percentage of the receipts of city fares as a basis.

Mr. Coates told a group of business men recently that the service-at-cost plan was started at a time when factories were closed, men out of work, the buying public on strike and business in general flat, but that he expected in the course of a year the plan would show up very well.

Chairman Henry Truesdall of the Board of Control and other board members have expressed themselves as not at all downhearted at the first report of financial conditions of the railway.

Plea for Municipal Ownership in Massachusetts

Interesting side lights on the point of view of the public in regard to the problem of electric railway service in Brockton, Mass., were brought out at the hearing recently in Boston on the bill of Representative Frank A. Manning to provide for municipal ownership of such lines by communities that might desire to take over the railways. The statement was made that 70,000 people in Brockton are not members of the local Chamber of Commerce and that the vote of that body recently against municipal ownership was not truly representative of the opinion of the public. The secretary of that body was quoted to the effect that at the vote only one-third of the membership expressed an opinion on the subject.

The author of the bill said that there was much talk about the investment of the widows and orphans in the securities of the electric railways, but that it was about time more thought was given to the widows and orphans who had to use the cars and to others of small means who desired convenient, comfortable and safe transportation at a reasonable fare.

Mr. Manning also wanted to know why the electric railways were singled out for State aid. He said that if the fact were true that because of their so-called public service the electric railways were entitled to special consideration at the hands of the State, then other businesses, with no less potent a claim, would soon call upon the State to insure them against loss in the operation of their properties.

It was his idea to have the public take over the railway lines, couple up as an operating unit the city of Brockton and the surrounding towns, eliminate unnecessary railway mileage, operate at a basic 5-cent fare and then assess any loss from operation against the respective communities on the basis of miles of track or some other unit fair alike to all places sharing in the service.

Industrial Court Urged for New Jersey

Fred C. Carstarphen, past-president of the Engineers' Club of Trenton, N. J., gave an illustrated talk before members of that body recently on "The Kansas Court of Industrial Relations and the Denver Street Car Strike." It was his opinion that the only proper method of settling labor disputes was through a court of industrial relations similar to the one now in existence in Kansas.

The Kansas Court of Industrial Relations had legal backing and labor disputes must be settled in a legal way to remain settled. He could not imagine why business men or railway officials in New Jersey did not get busy and have a bill similar to the Kansas measure adopted in that State. Mr. Carstarphen said:

> During the time the court has been in existence in Kansas there has never been an appeal made to the higher courts on a decision of the industrial body. If New Jersey adopted such a state measure there would be no future bloodshed, loss of wages or destruction of property in strikes and other disputes. The promises of labor leaders that there will be no trouble are never kept.
>
> Trolley employees in some of the larger cities have asked for ridiculous wages. Operators of electric railway cars who feel they are underpaid ought to seek some other employment. With all fairness to the union man, the labor union is not benefiting him to any great extent.

Mr. Carstarphen is a former resident of Denver. He was acquainted with both officials and employees of the Denver City Tramway and made a study of the strike in that city.

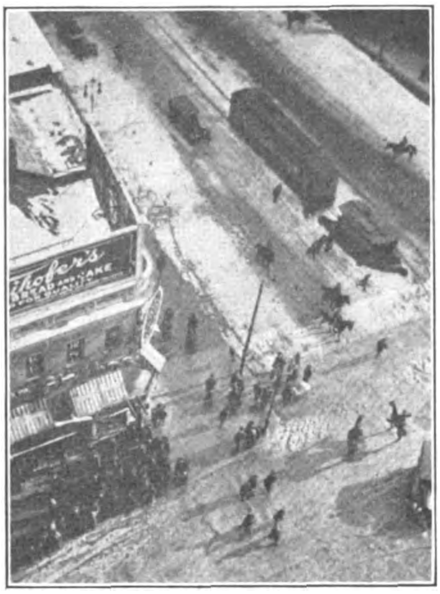
Newspaper Attack Resented

Railway at Albany Seeking to Resume Service After Strike Sues for $100,000 in Damages

Harry B. Weatherwax, vice-president of the United Traction Company, Albany, N. Y., has reiterated the stand of the company to the effect that no matter what develops the company will not arbitrate or compromise with the men in any way and that all relations between the company and the union ceased on Jan. 29, when the strike was declared.

Mr. Weatherwax is quoted as follows:

> The company receives about $300,000 a month from operation. This company cannot pay 60 cents an hour and make money. To raise fares to meet that cost would be impossible, because residents will not pay it. There is no use in raising wages and then going to the Public Service Commission and asking for an increased fare. That is what it amounts to every time wages are increased.



STATE CONSTABULARY GUARDING ALBANY CARS

> We can give a good service at 45 cents an hour, and residents will not be called upon to pay higher fares. We might just as well have this issue settled now.
>
> We have recruited a good force to take the place of the striking employees. They have come to us at 45 cents an hour. We will start regular service within a few days. The men who are operating the cars now will not be retained. The force that is being recruited will be a permanent one.
>
> We are receiving letters every day from all parts of the east from men who are experienced conductors and motormen and are willing to work at 45 cents an hour.
>
> The question of arbitration is closed for all time. There is no use discussing this matter any further. We are going to operate our company on the 45-cent basis, and that's all there is to it.

The company also said it had brought suit against the Albany Evening Union Company, publisher of the *Times-Union*, to recover the sum of $100,000 damages for libel. The complaint states that on or about Jan. 29 substantially all the employees of the railway left its service, thereby stopping the operation of all its cars. Subsequently and on Feb. 4 the Public Service Commission made an order directing the company to resume operation, and in compliance with that order the company began to operate its cars on Feb. 8. Afterward, or about Feb. 18, the company charged, the *Times-Union* printed in large type the following:

> "PAY AS YOU ENTER" Was the Sign on the United Traction Cars Before the Strike.
>
> "With the incompetent strike-breaking motormen now running the cars the sign ought to be:
>
> "PRAY AS YOU ENTER."

This notice is said to have been repeated daily in the *Times-Union*. It is further stated that the publication, distribution and circulation of the notice, which the United Traction Company claims to be false and defamatory, was for the purpose of giving public admonition to the company's patrons that it was unsafe to use the cars and become passengers thereon and to prejudice the public against the company and thus injure its business.

Mr. Mitten Not a Modern Dives

Wide publicity has been given by the daily press of the country to the statement made by T. E. Mitten, president of the Philadelphia Rapid Transit Company, to the effect that having achieved for himself some years ago a money competency which he considers adequate to his needs he has given away since each year all surplus over his expenses for the year. It was an unusual statement, made in an unusual way at an unusual event.

The occasion was a testimonial banquet on March 2 to Mr. Stotesbury and Mr. Mitten by the Co-Operative committees in celebration of the tenth anniversary of the successful operation of the co-operative plan. So many versions of Mr. Mitten's remarks have appeared, however, that the part of his statement outlining the principles that guide him are reproduced direct from the stenographic record of the meeting. Mr. Mitten said:

> A great amount of money is a hurtful influence. I tell the Doctor, my son—and I think the thought originated with him—that I will never deprive him of the pleasure of making money. Therefore, I will never leave him any. But he has gone me one better, and since coming back from service overseas he has insisted that I don't give him any money now. And so he is perhaps better able to keep in contact with you in the only way that one can keep in contact with another, that is, by meeting you on even terms, in that he has to figure out his costs as against his pay. Therefore, he has your problem and can better sympathize with you.
>
> Some of us envy the man with money. I have tried for sixteen years—it makes me sad when I have to think how long ago it was since I was forty—but when I was forty, and had accumulated all the money I thought a man needed to live on, I decided I would not follow the example of the men that I saw piling up riches. That gentleman who unfortunately is not with us tonight, and whom you have seen me bring to you at every meeting before. Mr. Robinson, New York, taught me the lesson that it is better to give than to receive.
>
> There is a rich man who has consistently, since 1896, backed me through thick and thin financially, when all other financial interests deserted me, and I have seen him always give and find joy in giving, never planned to receive at all. Following him at forty I determined that life and the struggle was a game, and so while I played it, as many hours of a day and as hard perhaps as any other. at the close of each year for sixteen years I have given away all of my earnings, only trying to hold intact the money that I had at forty. So that I don't have to worry about making money. It is of no interest to me. I am therefore free to enjoy the game, and a great deal of pleasure comes from it.

Conditions for Blanket Franchise in Richmond Summarized

Thomas S. Wheelwright, president of the Virginia Railway & Power Company, Richmond, Va., on March 2 issued a statement of the underlying principles which the company considers as the sound economic basis on which to base a new blanket franchise for all the Richmond railway lines. He summarized the position of the company as follows:

1. That the city, in granting a new franchise, recognize the value of the railway property now in the service of the public. In arriving at this value a careful inventory has been made of just such property as is now in use, cutting out such as has been abandoned or that is not useful in the service. This value, at the average of prewar and present prices, is $12,488,841—for the railways, including outlying lines, bridges, viaducts, etc.
2. That the franchise include the obligation to at all times authorize such rates of fare as will earn a just and inviting return upon this investment in order to insure the integrity of the present investment and to induce additional capital to flow into the enterprise for the purpose of extending the service to the needs of the community.
3. That the policy of the city will have to be made plain in this franchise as to whether it includes all lines outside of the city and whether it will assume the obligation to fix such rates of fare as will insure a return on the whole investment, including the outlying lines, having one standard fare prevail throughout the Richmond system, including free viaducts.
4. That it is desirable the fare be as low as possible in order that the railway may perform its proper function of service to the community. To accomplish this the new franchise should relieve the company of all burdens in the way of tax on franchises, paving, etc., which are not proper charges against the car rider, since the company already pays taxes on the assessed value of its property, the same as any other enterprise. Under present conditions the car rider is taxed to the extent of at least one-half a cent for every ride and, in addition, a paving tax is imposed, which is not as legitimate for the car rider to pay as for the person using a private vehicle, since the latter uses the street to a far greater extent than the car rider who, using the rails and riding in groups, uses the street in the most economical manner possible.

News Notes

Men Accept Wage Cut. — The employees of the Charles City (Ia.) Western Railway have offered to accept a 20 per cent reduction in wages in order to assist the company in meeting the present emergency of increased costs.

Suburban Lines Reduce Wages.—The New York & Long Island Traction Company and the Long Island Electric Railway recently reduced the wages of the employees 12½ per cent. This applied to all departments, operating, engineering, legal, etc. A similar reduction of 12½ per cent was put in force on March 6 on the lines of the New York & Queens County Railway.

Steam Service on Electric Line.—Because of overhauling its turbines in the Westville Power Plant which has resulted in insufficient electric power to handle peak periods, the West Jersey & Seashore Railroad has substituted temporary steam service between Camden and Glassboro and Camden and Millville, New Jersey. During the summer if the repairs are still under way it may be necessary to increase this steam service to take care of service during the peak hours.

Wages Reduced in Muskegon.—The Muskegon Traction & Lighting Company, Muskegon, Mich., has reduced the wages of its trainmen 16 per cent, or from 62 to 52 cents. George Steinwedell, president of the company, is quoted as follows: "Something must be done in the present crisis if the railway is to continue to operate. I wish it was possible for this company to obtain the advice and suggestions of citizens of Muskegon. I am sorry that there are some here that still look with suspicion on all statements of the company, after we have tried to adopt a policy of placing the facts before the public at all times. That has been my policy since taking charge of the local company. We desire helpful criticism and suggestion, but we do not believe that this is the time for fault finding."

Will Study Fresno Finances.—At a public meeting recently held in the Fresno Council Chamber to consider transportation problems and the service-at-cost system of operation a committee was appointed to look into the finances and service of the Fresno (Cal.) Traction Company and the operation of the plan as proposed for the city. Mayor Toomey and Manager Webster of the Fresno Traction Company addressed the meeting. Mr. Webster mentioned the fact that many eastern cities "had taken their utilities in hand and arranged for a franchise under which the integrity of the investment was guaranteed." The Mayor said that the company was entitled to a fair return on its investment and the public to a fair return in service.

Programs of Meetings

New York Railroad Club

The next meeting of the New York Railroad Club will be held in the Engineering Societies Building on March 18. Frank M. Brinkerhoff will present a paper, "Safety of Passengers in Steel Cars," illustrated with lantern slides.

American Railway Engineering Association

The twenty-second annual convention of the American Railway Engineering Association will be held in the Congress Hotel, Chicago, on March 15-17. After the president's address, on March 15, reports of committee on track, rail, electricity and other subjects will be heard. Among the committees to report on Wednesday, March 16, are those on Economies of Railway Labor, Shops and Locomotive Terminals. On **Thursday** the reading of papers will be heard, followed by the election of new officers. The annual banquet will take place on March 16. Among the speakers scheduled for the dinner are J. F. Wallace, consulting engineer, New York; David Kinley, president University of Illinois.

Annual Banquet of New England Street Railway Club

John W. Belling, secretary of the New England Street Railway Club, announces the annual meeting and banquet to be held at the Copley Plaza Hotel, Boston, Mass., on Tuesday, March 22. The program includes the annual meeting at 3 p.m. for the election of officers for the ensuing year. At 6 p.m. there will be a general reception followed by the banquet at 6:30.

The committee announces as speakers Hon. Selden Palmer Spencer, United States Senator from Missouri; his Excellency Channing H. Cox, Governor of Massachusetts, and Hon. Andrew J. Peters, Mayor of Boston. Alonzo R. Williams, attorney for the Rhode Island Company, will act as toastmaster.

Tickets for the annual banquet are $6. Secretary Belling is sending out to members a unique desk blotter reminder of the affair. Applications for tickets should be addressed to the club at P. O. Box 2564, Boston.

Joint Convention of Illinois Utility Associations

The seventeenth annual meeting of the Illinois Gas Association, the twentieth annual meeting of the Illinois State Electric Association and the twelfth annual meeting of the Illinois Electric Railways Association will be held in joint convention at the Hotel Sherman in Chicago on March 15 and 16. On Tuesday, March 15, at the opening session John F. Gilchrist, vice-president of the Commonwealth Edison Company will read a paper "Financing Through Your Customers." At the afternoon session the following papers will be read, "Passenger Traffic Analysis and Control," by M. J. Feron, Chicago Elevated Railroads; "Shop Organization and Maintenance and Inspection of Equipment," by J. M. Bosenbury, Illinois Traction System; "Introducing the Employee to the Job and Following Him Up," by W. R. Helton, Manager Real Estate Department, South Side Elevated Railroad. On Wednesday, March 16, Philip H. Gadsden, president of the American Electric Railways Association, will tell just what his association is doing. The following papers will be read at the afternoon session, "Testing of Instrument Transformers," by F. A. Kartak, professor of Electrical Engineering, School of Engineering of Milwaukee; "Hazards of Faulty Switchboard Construction," by R. M. Bert, electrical superintendent Rockford Electric Company; "Labor Saving Devices of the Maintenance of Way Department and What They Save," by Charles Clark, Cleveland Railway; "Merchandise Service and Its Possibilities," by D. W. Snyder, general superintendent, Bloomington & Normal Railway & Light; "Results of Automatic Substation Operation," by C. H. Jones, Chicago, North Shore & Milwaukee Railroad. In addition to these papers others will be presented of interest to gas and electric light companies.

Financial and Corporate

Commissioner Demands Changes

Cincinnati Official Wants Corporate Structure of Railway Changed and Franchise Modified

Complete financial reorganization of the Cincinnati (Ohio) Traction Company and separation of that company from all other activities except those necessary for the operation of a street railway have been demanded by William C. Culkins, director of street railways, in a letter sent to the Cincinnati Traction Company and the Cincinnati Street Railway. The letter was sent by Mr. Culkins after a conference with Mayor John Galvin and City Solicitor Saul Zielonka.

Mr. Culkins also demands "either the surrender or modification of the present franchise or the acceptance by a new company of a new or modified franchise, which shall include such changes as may be shown by experience in this and other cities to be advantageous to the public including special fares for school children."

VIGOROUS ACTION NECESSARY

In his letter, Mr. Culkins points out that the railway situation has reached a point where the most vigorous and drastic action is essential. The acute conditions are said to be the result of a period of economic stress due to deflation and readjustment which has brought heavy losses of traffic on all lines of the Cincinnati Traction Company because of unemployment and high fares. Mr. Culkins stated that he had the authority under the present franchise to enforce his demands, and that he would do so, if the companies do not voluntarily accede to them. Mr. Culkins' letter to the two companies follows:

> So involved has the situation become that the public interests demand the taking of immediate steps for the solution of the present difficulties, which so seriously interfere with the performance of your contractual obligations. I feel, therefore, that it is my duty to require that the following program be carried out:
>
> 1. That complete financial reorganization be made of your companies with a divorcement of all other activities from those necessary for railway operation, in order that the city may deal with a single responsible corporation. This should include a scaling down of the present capitalization in order that the burden of fixed charges may be reduced and that the company may be placed on a sound financial basis which will enable it to obtain the necessary funds for carrying out such improvements and betterments as public convenience may require.
> 2. That accounts be promptly adjusted between the Cincinnati Traction Company and its collateral corporations as ordered by the director of street railroads, upon which suit is now pending; and the discontinuance of the present objectionable interrelations between these or other companies.
> 3. That the present franchise be surrendered or modified and a new or modified franchise be accepted by a new company which shall include such changes as may be shown by experience in this and other cities to be advantageous to the public, including special fares for school children as desired by the City Council and other amendments which have been suggested.

In reply to Mr. Culkins' demand to reorganize the three companies, W. Kesley Schoepf, president of the Cincinnati Traction Company, said plans are under way for merging the companies which jointly own and operate the railway system of Cincinnati. These companies are the Cincinnati Traction Company, which operates the street railway system; the Ohio Traction Company, which owns stock of the Cincinnati Traction Company, and the Cincinnati Street Railway, which owns property which the Cincinnati Traction Company operates.

While no definite plan has been worked out, the officers of the companies have on numerous occasions expressed their belief that something should be accomplished in the direction of simplifying the inter-corporation relations of the several companies, Mr. Schoepf said. It is expected that some definite recommendations can soon be made to the companies concerned.

Sacramento Northern Line Sold

The Western Pacific Railway, San Francisco, has elected to purchase the bonds and securities of the Sacramento Northern Railway actually deposited on the terms mentioned in its offer, the time for such deposits having expired at the close of business on Feb. 23.

In addition, the Western Pacific announced that it would purchase on the same terms any other bonds and securities of the Sacramento Northern which might be deposited with the First Federal Trust Company or the Union Trust Company before the close of business on March 5.

The Western Pacific's action in accepting present deposits as sufficient, and extending to remaining holders the privilege to deposit their securities until March 5, closes the matter. Approval of the deal must be obtained from the Railroad Commission and the Interstate Commerce Commission.

$778,113 Loss in Providence

Operation Under the Receivers During Year 1920 Improved $255,265 Over that of 1919

The Rhode Island Company, Providence, R. I., was operated by its three receivers during the year 1920 at a loss of $778,113, according to its financial statement for the year filed on Feb. 26 with the Public Utilities Commission. This deficit is $255,265 less than that of 1919 which was $1,033,397.

The statement filed with the commission also shows that the receivers had at the close of the last year a cash balance in the bank of $1,585,188. This balance is due to the fact that the company has not paid rentals of $1,097,208; interest and discount of $318,300, as well as some miscellaneous expenses and certain taxes, all of which have been charged off against the net income and are included in the deficit.

The company carried 127,482,086 passengers during the year, an increase of 5,966,144.

Analysis of the figures reveals the fact that the receivers have made substantial gains in operation during the year. There were only three months in the year, February, March and November, that the operating revenue did not exceed the operating expense. The report also shows an enormous decrease in the number of transfers issued, it being the first full year that the company has charged for the tickets. The number of transfers issued was 12,818,215, a decrease of 1,377,636.

MORE THAN $8,000,000 GROSS EARNINGS

The company's report shows that during 1920 it paid for power fuel $900,042, an increase of $344,389 over the previous year.

The total revenue per car-mile was 57.66 cents, and the total operating expense per total car-mile was 48.03 cents, leaving 9.63 cents as a net income per car-mile. Last year the company spent $262,502 for snow removal, while the report shows that it spent nothing for removing snow in 1919.

The passenger earnings for the year were $634,260 as compared with $636,081 in 1919, a decrease of $1,821. During the same period the company increased its car-miles operated 18,745 miles.

INCOME ACCOUNT OF THE RHODE ISLAND COMPANY FOR DECEMBER, 1920 AND FOR TWELVE MONTHS ENDED DEC. 31, 1920, COMPARED WITH LIKE PERIODS FOR 1919

	December, 1920	One Month Increase or Decrease	One Month per Cent	Twelve Months to Dec. 31, 1920	Twelve Mos. Increase or Decrease	Twelve Months, per Cent
Total operating revenue	$655,365	*$32,442	*4.72	$8,304,146	$1,333,471	19.13
Total operating expenses	400,705	*329,596	*45.13	6,916,416	988,153	16.67
Net operating revenue	$254,659	$297,154	699.28	$1,387,730	$345,317	33.13
Non-operating income	4,822	2,746	132.28	36,011	*1,841	*4.86
Total net income	$259,482	$299,900	741.99	$1,423,742	$343,476	31.80
Deductions from income:						
Taxes	$196,802	$147,522	299.35	$786,276	$164,390	26.43
Rentals	87,920	*9,196	*9.47	1,097,208	*64,665	*5.57
Interest and discount	26,523	....	....	318,300	*9,954	*3.03
Miscellaneous	....	*5	*100.00	70	*1,560	*95.69
Total deductions	$311,246	$138,320	79.99	$2,201,855	$88,210	4.17
Surplus or deficit	†$51,764	$161,580	75.74	$778,113	$255,265	24.70

* Decrease. † Deficit.

Each month the company set aside a certain amount for claims and other purposes. This amount was not used entirely, and the surplus was applied in the form of an adjustment to the operating expense for the last month of the year.

Brooklyn Roads Still Running Behind

The Public Service Commission for the First District of New York has tabulated the results of operations of all street railroad companies formerly comprised in the Brooklyn Rapid Transit system for the six months ended Dec. 21, 1920. In the column of operating expenses and taxes, which total $22,077,086, is included the expenses of the strike in September last. The strike cost the companies $2,425,902, the report says. The deficit in operating income of all the companies for the six months is $2,237,690.

The total income deductions for the payment of interest, etc., on obligations of both the corporation and the receiver aggregated $5,138,735. The total deficit after fixed charges of all companies is $6,881,715.

The Brooklyn City Railroad, which began separate operation on Oct. 19, 1919, shows the following figures for the last six months of 1920: Operating revenue, $4,826,445; operating expenses, $5,426,392; operating deficit, $599,946; non-operating income, $40,032; gross income (deficit) $559,914; income deductions, $339,849; net income (deficit) $899,764.

Compared with the corresponding period in 1919, the figures for the last six months of 1920 for all the companies formerly comprised in the B. R. T. system, show a decrease in operating revenue of $103,917, an increase in operating expenses of $4,084,351, a decrease in gross income of $4,158,775, and a decrease in net income of $4,731,343.

Portland Notes Offered Direct to Public

Employees and customers of the Portland Railway, Light & Power Company, Portland, Ore., and the general public are now being offered for direct sale $1,000,000 of 8 per cent five-year gold bonds of the company. Sales are being made on the partial payment plan. The proceeds are to be used for betterments and improvements.

The earnings and expenses of the company for the twelve months ended Dec. 31, 1920, as made public in connection with the present financing, were:

Gross earnings		$9,564,615
Operating expenses and taxes	$6,031,311	
Depreciation	717,386	6,748,697
Net earnings		$2,815,918
Fixed charges (bond interest, etc.)		2,104,459
Surplus		$711,459

The company explains that the surplus for the year 1920 was nearly nine times the annual interest charge on the $1,000,000 of notes now offered.

Stock Return Not Earned

Earnings of $487,027 in Dispute Before Courts May Alter Situation in Buffalo

Notwithstanding the increase in fares granted during 1920 by the New York State Public Service Commission, the International Railway, Buffalo, failed to earn its fixed charges by $149,570 according to the annual report of the company for the calendar year 1920. Bond interest, however, was paid and the deficit made up by reducing the amount set aside for depreciation and renewals.

There is a chance for this deficit to be liquidated, provided the State courts uphold the commission in granting increased fares on the interurban lines. Rebate slips have been issued since the fares were increased. The value of such slips now outstanding amounts to $487,027. Thus, if it were possible to credit this money to income, there would be a balance of $337,458 instead of a liability. This balance is equivalent to $2.09 on each share of the outstanding stock.

In speaking of the reorganization recently effected by which the International Traction Company was eliminated from control of the Buffalo property, the report states that the primary object of the protective committee was to provide for the liquidation of the accumulated debt of the International Railway. This was accomplished by the sale of securities acquired by the protective committee following the foreclosure of the International Traction collateral trust 4 per cent mortgage. After providing for its obligations, the protective committee cancelled $2,070,189 of notes issued by the International Railway to the protective committee. This act by the protective committee represents in effect the contribution of $2,070,189 to the International Railway by the stockholders, which overcomes the impairment of capital amounting to $1,887,504 as shown by the deficit in the balance sheet as of Dec. 31, 1920, and provides a balance of $182,685, applicable to surplus.

VOTING TRUST AGREEMENT

In arranging to raise approximately $2,000,000 for the rehabilitation of the property, the protective committee provided for a voting trust conferring upon voting trustees power to vote the stock of the company for a term of five years, and delivered to these trustees $1,944,000 of railway refunding and improvement 5 per cent bonds and $640,500 of underlying 6 per cent first mortgage bonds. The voting trustees hold these in trust, but with power to sell or otherwise use the bonds and the proceeds thereof for the benefit of the company or the holders of the voting trust certificates.

The Lockport & Olcott Railway mortgage, which amounted to $800,000, became due on July 1, 1920. Failure to pay at maturity the bonds secured by this mortgage would have created a default under the refunding and improvement 5 per cent mortgage of the International Railway. The banks in Buffalo and vicinity developed a plan for the exchange of these maturing bonds for a new issue of $800,000 of International Railway five-year 7 per cent collateral trust bonds secured by $1,200,000 of refunding and improvement 5 per cent bonds. The $400,000 left after payment of the Lockport and Olcott bonds were delivered to the International Railway by the protective committee in order to assist financing the maturing underlying issue. The holders of the $600,000 of Lockport-Olcott bonds accepted this exchange; $195,000 was paid in cash, and $195,000 of the five-year 7 per cent collateral trust bonds are now held in the treasury of the International Railway Company.

INCOME ACCOUNT—INTERNATIONAL RAILWAY, BUFFALO

Year ended Dec. 31	1920	1919	Per Cent Change
Passenger revenue....................	$10,860,135	$9,020,790	+20 39
Other operating revenue....................	343,982	280,116	+22 80
Total railway operating revenue....................	$11,204,117	$9,300,906	+20 47
			Per Cent Operating Revenue
Way and structures and equipment:			
Maintenance....................	$1,699,272	(a)	15 16
Depreciation and renewals (b)....................	866,430	(a)	7 73
Power operation....................	632,468	(a)	5 65
Conducting transportation....................	3,882,558	(a)	34 65
General and miscellaneous....................	1,861,396	(a)	16.61
Total railway operating expenses....................	$8,942,124	(a)	79 80
Net operating revenue....................	2,261,993	(a)	20 20
Taxes....................	674,365	(a)	6.02
Operating income....................	1,587,628	(a)	14.18
Non-operating income....................	69,579	(a)	.62
Gross income....................	$1,657,207	(a)	$14.80
Interest....................	$1,541,531	(a)	$13 76
Rentals, etc....................	47,845	(a)	.44
Amortization of discount....................	67,831	(a)	.60
Net deductions or fixed charges....................	$1,657,207	(a)	$14.80
Net income....................	$0,000	(a)	$0.00

(a) Not available.

(b) The formula for depreciation and renewals adopted by the P. S. C. when granting increased fares in 1920 requires a total of $1,016,000 annually. The company failed by $149,569.75 to earn enough to set this aside after paying operating expenses, taxes and fixed charges.

State Aid Imperative

President Storrs of Connecticut Company Says Paving, Tax and Other Charges Must Be Rescinded

Only $11,381 was earned as operating income by the Connecticut Company during 1920. This figure and others pertaining to the conduct of the business of the railway for the year were made public by L. S. Storrs, president, at the meeting of the Connecticut Company section of the American Electric Railway Association at New Haven on March 3. The figures follow:

COMPARATIVE EARNINGS OF CONNECTICUT COMPANY — NOT INCLUDING NEW LONDON DIVISION

	1917	1918	1919	1920
Gross revenue	$10,023,162	$9,935,750	$11,043,804	$12,287,505
Operating expenses	7,821,005	8,150,433	9,210,376	11,586,439
Net operating revenue	$2,202,157	$1,785,317	$1,833,428	$701,066
Taxes	594,509	575,888	619,657	689,685
Operating income	$1,607,648	$1,209,429	$1,213,771	$11,381

PERCENTAGE OF TOTAL REVENUE OF CONNECTICUT COMPANY APPLICABLE TO EACH ITEM OF EXPENSE

	1916	1918	1919	1920
Wages	37.5	47.4	50.7	59.6
Electric power	12.0	16.4	15.5	16.5
Maintenance of paving, track, etc	8.0	4.7	5.6	4.4
Maintenance of equipment	3.0	5.4	4.1	5.8
Depreciation of equipment only	1.0	0.7	0.6	0.6
Miscellaneous and general expenses	6.0	7.4	6.9	7.7
Taxes	4.5	5.8	5.6	5.7
Rentals and interest	10.0	10.2	10.0	10.7
Balance for improvement and return on value	18.0	2.0	1.0	....
Deficit	....	....	....	11.0
Total	100.0	100.0	100.0	100.0

ITEMIZED DIVISION OF OPERATING EXPENSES OF CONNECTICUT COMPANY

	1917	1918	1919	1920
Payrolls	$4,344,296	$5,054,858	$5,959,332	$7,796,537
Coal	847,963	902,884	676,258	1,055,210
Materials	1,393,294	1,463,260	1,195,028	1,328,973
Accidents	268,029	317,505	325,810	357,168
Insurance	48,059	63,170	65,659	70,163
Power purchased	385,000	378,000	467,000	578,000

Mr. Storrs explained that the Connecticut Company, like all other electric railways, had experienced extreme difficulty in passing through the period of great advance in costs. As shown in the accompanying table wages of the company increased from a percentage of 37.5 before the United States entered the war to 59.6 per cent at the present time. The most noticeable change other than wages was in the cost of electric power. This item increased from 12 per cent in 1916 to 16.5 per cent in 1920. Since 1917 the payrolls have very nearly doubled, increasing by $3,452,241. The cost of coal has increased $200,000. The lower cost of coal in 1919 than in 1918 is explained by the fact that during the summer months of 1918 all storage capacity was utilized in anticipation of transportation difficulties and reduced output of coal. The value of coal on hand at the close of 1918 was $175,000 more than that on hand at the close of 1919. The decrease in the expense for materials in 1919 as compared with 1918 was due to purchases being made in anticipation of general price increases.

In 1917 fares were increased to 6 cents. For the last ten months under this system, namely, Jan. 1 to Oct. 31, 1919, the receipts increased an average of 9.7 per cent per month, while the expenses increased an average of 14.1 per cent per month over the previous year. The zone system was next tried. Compared with the previous year from November, 1919, to May, 1920, the receipts increased 24.6 per cent per month, while the expenses increased 26 per cent per month. The zone system was then revised and from May, 1920, to August, 1920, the receipts increased over the previous year by 10.9 per cent per month, while the expenses increased 45.7 per cent per month. The original 5-cent fare limit system was then reinstalled except that 7- and 6-cent fares were charged. Under this scheme the receipts averaged 7.9 per cent increase and the expenses increased 28 per cent per month over the previous year. This plan had been in operation only about three months when the 10-cent fare was started. Since Nov. 1, 1920, the receipts have increased an average of 24.7 per cent and the expenses have increased about 28.2 per cent.

Except for a loan of $1,250,000 from the government in connection with war activities, it has been impossible for the company to borrow. In consequence the company has been required to use in the regular course of business money which would otherwise have been used for rentals and taxes. In consequence taxes for 1917, 1918, 1919 and 1920, totaling $1,969,880, stand as a charge against the company. The total amount of deferred paving obligations is $648,000.

Mr. Storrs said that the taxes of railways should be based upon net income and not gross revenue. The State should share in the successes or losses of the utilities by the above-mentioned method of taxation. The companies should not be obliged to pay for paving or bridge construction; in short, it should not be called upon to bear any expense which does not jointly benefit the company and the car rider.

Indiana Merger Authorized

$6,000,000 Reduction in Stock Under Commission Ruling Approving Merger of Southern Indiana Lines

The order providing for merger of the Interstate Public Service Company and five other utilities in southern Indiana was issued by the Indiana Public Service Commission on March 4. Ira E. Guthrie, secretary and treasurer of the Interstate Public Service Company, said:

> The biggest thing in the decision of the commission is the condition imposed on the Public Service Company, requiring that the capital stock of the five merging concerns be reduced at least $6,000,000.
>
> It always has been the purpose of the Public Service Commission to reduce wherever possible the capital stock of utility companies. In granting the present merger they have required and will obtain a decrease of more than $1,000,000 in each of the merging companies.
>
> The present total capitalization of the five selling companies is $24,792,630. We intend to reduce this amount to $18,866,300, making a reduction in the capital stock alone of $5,926,330. In addition the current indebtedness of the five companies, which totals $1,329,627, will be extinguished by the Interstate Public Service Company. Our assets after the merger will total approximately $17,000,000.
>
> The merger will mean a great deal to the Interstate Public Service Company, not only in increased assets brought about by purchase of the other companies, but in the absolute unity and control of railway facilities between Louisville and Indianapolis and the northern and southern parts of the states which the new system will afford us.
>
> The Interstate Public Service Company is absolutely sound financially. During the last year we spent more than $750,000 on improvements. We will be able to obtain greater credit than any or all of the other companies under separate control, and thus will be able to provide necessary repairs and improvements in many of the plants operated by the selling companies.
>
> Particularly will the merger benefit the railway service between Indianapolis and Louisville, for consolidation will put both the northern and southern ends of the system in absolute control and unity. Better service and improvements will be the natural result.

The five companies to be taken over by the Interstate Public Service Company are the Central Indiana Lighting Company, the Louisville & Northern Railway & Lighting Company, the Louisville & Southern Indiana Traction Company, United Gas & Electric Company and New Albany Water Works.

Attempt Made to Revive Blue Hill Line

A bill has been introduced in the Massachusetts Legislature to have the State, through the agency of the trustees operating the Boston Elevated Railway, assume the rehabilitation and resumption of service on that part of the old Blue Hill Street Railway which lies between the Mattapan terminus of the Boston Elevated and the Reservation road to Great Blue Hill, a distance of about 3½ miles. This is only a small section of the Blue Hill system.

Operation of the Blue Hill Street Railway was suspended some time ago, and the property was sold as junk in 1920, under foreclosure proceedings. The purchaser, however, has not yet removed the track or overhead line, and it is believed that this portion of it might be put in operating condition at a cost not exceeding $30,000 for purchase and about the same amount for rehabilitation.

Ten Years' Report

Results of Stotesbury-Mitten Management Made Public by Philadelphia Rapid Transit Company

The Philadelphia Rapid Transit Company has just issued a small pamphlet entitled "Philadelphia Rapid Transit, Stotesbury-Mitten Management, 1911-1920," giving some of the important results on that property during the past ten years.

It declares that in 1911, when Mr. Stotesbury was asked to rehabilitate the company and invited Mr. Mitten to become active head, the company was in bad condition. Under Mr. Mitten's contract, which was made to cover no specific period, but could be terminated at the close of any fiscal year upon three months' notice from either side, Mr. Mitten assumed responsibility for the company's rehabilitation. In December, 1920, a voting trust agreement, originally for five years and later extended, was dissolved. Today, the pamphlet says, no individual stockholder owns more than 6,400 shares, and three-fourths of the stockholders own 100 shares or less.

During the past ten years car capacity has increased from 67,908 seats in 1911 to 131,393 seats in 1920. The rides per capita have increased 74 per cent. The average speed of all cars has gone up from 7.97 m.p.h. in 1911 to 9.33 m.p.h. in 1920. The average accident costs during the period have been 3.41 per cent of the gross, as compared with a previous 6.08 per cent. The average fire insurance rate has been decreased from 50 cents to 17⅓ cents per $100 of insurance carried. The number of conductors and motormen has decreased from 7,424 to 6,025, although the receipts have increased from $18,400,000 to $38,000,000. The fixed charges have been reduced from 45.32 per cent of the gross to 24.93 per cent of the gross.

The present fare is 7 cents, with four tickets for 25 cents. Statistics in regard to rates of fare are shown in the accompanying table.

ANALYSIS OF PHILADELPHIA FARES 1910-1920

Calendar Year	Fare per Passenger, Cents	Total Passengers	3-Cent Exchange Points	3-Cent Exchange Passengers	3-Cent Exchange Per Cent Total	Free Transfer Points	Free Transfer Passengers	Free Transfer Per Cent Total
1910	4.13	445,599,008	655	21,285,569	4.78	210	67,281,688	15.10
1911	4.07	520,425,581	650	24,795,479	4.76	224	84,363,551	16.21
1912	4.03	553,471,846	648	25,684,710	4.64	240	93,072,322	16.81
1913	4.00	584,721,865	646	26,784,380	4.58	285	101,319,056	17.33
1914	3.95	585,364,297	641	27,119,544	4.63	310	107,908,712	18.43
1915	*3.91	598,111,900	636	27,221,924	4.55	312	114,620,321	19.16
1916	3.91	672,959,447	620	31,939,375	4.75	315	127,990,030	19.02
1917	3.91	731,470,879	602	36,710,434	5.02	317	136,595,637	18.68
1918	3.98	767,758,406	580	43,791,710	5.70	320	130,472,269	17.00
1919	3.98	872,755,398	536	51,675,791	5.92	333	149,427,164	17.12
1920	4.15	913,870,463	537	55,233,232	6.04	336	154,079,623	16.86
10 yrs.	3.99	6,800,910,082		350,956,579	5.16		1,199,848,685	17.64

*The low rate of 3.91 cents per passenger in 1915 was accomplished through the substitution of free transfers for 3-cent exchange tickets at the several points where they seemed most burdensome to the public, and the establishment of free transfer points at many places to overcome paying double fare; this rate increased to 3.98 cents in 1918 due to the lesser use of free transfers by transient riders during the war-time period.

Funds Provided for Improvements

The Ohio State Public Utilities Commission has advised William C. Culkins, director of street railways at Cincinnati, Ohio, that it has approved the application of the Cincinnati Traction Company for permission to issue $982,000 of securities for the purpose of providing funds to extend the Warsaw Avenue line and to make other improvements.

P. R. T. Nets $162,793 for January

The net income of the Philadelphia (Pa.) Rapid Transit Company for the month of January, 1921, as shown in the accompanying table, is $162,793, which is considerably less than the company's showing for the previous month, December, 1920, which was $427,494. However, it shows a marked improvement over the net income of January, 1920, which amounted to $51,163.

After deducting $125,000 to cover the monthly deduction to make a 5 per cent return on the outstanding stock there remains a surplus of $37,793 to credit against accumulated deficit of the year ended Dec. 31, 1920.

STATEMENT OF EARNINGS OF PHILADELPHIA RAPID TRANSIT COMPANY

Month Ended Jan. 31		1921	1920	Percentage Change over 1920
Operating revenue		$3,618,349	$3,043,258	18.9
Operation and taxes		2,670,905	2,215,477	20.6
Operating income		$947,443	$827,781	14.5
Non-operating income		37,591	39,987	—6.0
Gross income		$985,035	$867,768	13.5
Fixed charges		822,241	816,604	0.7
Net income		$162,793	$51,163	218.0
5 Per cent return on P. R. T. paid in capital—month of January, 1921	$125,000.00			
Amount by which gross revenues were insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock for the year ended Dec. 31, 1920	$1,117,934.77			
		$1,242,934		
Accumulated deficit for the thirteen-month period to January 31, 1921		$1,080,140		

Financial News Notes

Another Abandonment Proposed in New York.—The Belt Line Railway Corporation in Manhattan has served notice of its intention to abandon its 5 miles of line between Forty-second Street and Battery Place, New York City.

Sale Direct to People of Houston.—The Houston (Tex.) Electric Company will offer for sale to the people of Houston $250,000 of five-year notes bearing 8 per cent interest. The notes will be in denominations of $100, $500 and $1,000. The money raised by the sale of these notes will be used in construction of a double-track line on Fannin Street as the first step in the proposed removal of the tracks from Main Street. This is the first effort of the Houston traction company to sell its securities to the people of Houston.

San Francisco Road to Be Sold March 24.—Foreclosure sale of properties of United Railroads, San Francisco, Cal., is set for March 24. Under plan of reorganization properties are sold under foreclosure on a technical default of interest on one of the underlying bond issues and will be bought in by Market Street Railway. Upon consummation of the sale United Railroads will be merged with Market Street Railway, whose name the reorganized company will take. It is stated that new securities authorized under the plan will be issued immediately after the foreclosure sale has taken place. The plans for the reorganization of the company and the scaling down of present capitalization have been reviewed previously in the ELECTRIC RAILWAY JOURNAL.

Charter Application Withdrawn.—The application of the British Columbia Electric Railway, Vancouver, B. C., for a federal charter, thereby bringing the company's railway, light and power lines in Vancouver and Victoria under the Board of Railway Commissioners, has been temporarily withdrawn by the company pending a settlement with the municipalities. The various councils have tentatively agreed to permit the present fares to be charged until July 1, 1922, and not to press for a return to the franchise fares. Provided by-laws to this effect are passed by each city and municipality served, the company agrees to withdraw its application for a federal charter, but within six months new agreements must be entered into with the view of adjusting the company's rates and fares on a stable basis. Failing such agreements, the company may reinstate its application for a federal charter. The plan has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

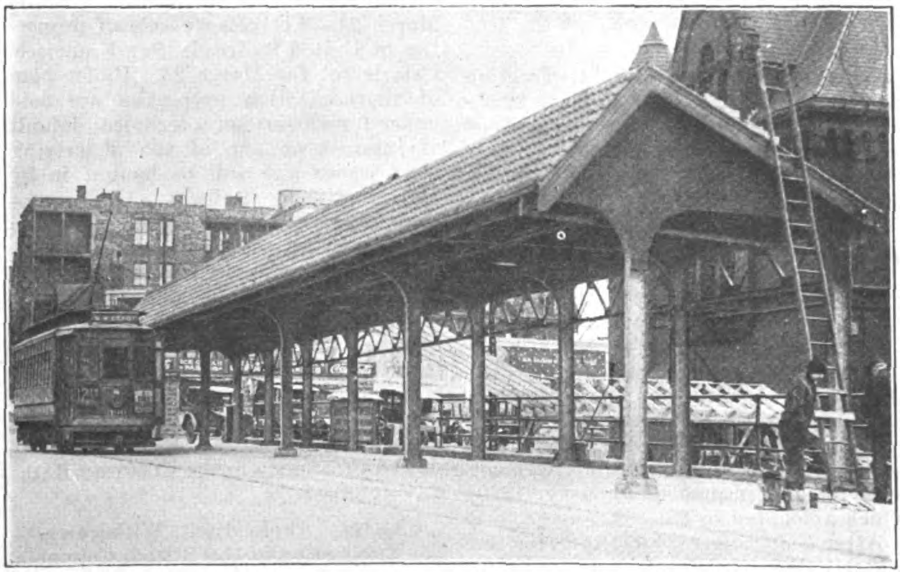
Traffic and Transportation

New Railroad Shelter

Milwaukee Company Takes Advantage of Street Construction to Provide for Its Patrons

In order to afford greater protection to travelers arriving in Milwaukee via the Chicago & Northwestern Railway and using the city cars of the Milwaukee Electric Railway & Light Company the latter company has erected outside the railroad station the shelter shown in the accompanying illustration.

The shelter, of steel with a red tile roof, is approximately 100 ft. long. It covers the width of the sidewalk. It is equipped with electric lights and is connected with the company's dispatching phone system. A covered and lighted passageway has also been erected, leading from the railroad station to the shelter, so that arriving or departing travelers using the street cars can enter or leave the station without being exposed to inclement weather. A supervisor is in attendance at the station familiar with the city to direct travelers who desire to use the street cars.



SHELTER IN MILWAUKEE—NEW FACILITY FOR TRAVELERS

The Northwestern Depot, as it is familiarly known in Milwaukee, is located on the lake front at the corner of Wisconsin and Marshall Streets. It is served by the Twelfth, State and Clyborne Street car lines of the Milwaukee company. All three used to discharge and receive passengers at the end of the line on Wisconsin Street in front of the depot entrance, and passengers had to walk into the middle of the street to reach the street cars. When street reconstruction work was recently performed in the vicinity of the depot the local railway constructed a loop around the block facing the depot and built the shelter on Marshall Street in front of the depot. Now all cars on the eastbound trip circle the loop, stop in front of the shelter to discharge and receive passengers and then turn into Wisconsin Street and proceed westbound into the city.

If permission can be obtained from the railroad it is planned to place one or two illuminated signs in the depot directing the traveler's attention to the street car facilities.

Co-operation of Public Invited to Keep Fares Down

In a pamphlet distributed to its railway patrons, entitled "Your Carfare" and ."Let's Pull Together," the Tacoma Railway & Power Company, Tacoma, Wash., is appealing to the riding public to co-operate with it in solving the transportation problems. The objects to be accomplished, as set forth in the pamphlet, are "to increase the riding on cars," "to eliminate various practices and abuses which mean losses in earnings and increased cost of operating" and "to cut down those charges made against the company for the right to give service" and continue the present fare. The pamphlet says by way of introduction:

> Six months ago the Public Service Commission directed us to put into effect a tariff fixing cash fares at 10 cents and tickets at 8 cents. We had determined after intensive study of the railway situation in Tacoma, that a 10-cent straight fare was essential—but the commission did not see fit to grant such an increase. The result, over a period of six months, shows that a straight 10-cent fare would more nearly have met our financial needs.
>
> There are really two interested parties in this railway problem. You people who ride day after day, and the company itself.
>
> Both of us want to keep fares down.

Safety Campaign a Success

Co-operation in Portland, Ore., Has Brought About Material Reduction in Accidents

Splendid results have been achieved by the Portland Railway, Light & Power Company, Portland, Ore., in its intensive "Safety First" campaign, which has been continuously under way since January 7.

The first official check on the results of this test were compiled early in February by Fred Cooper, city superintendent, and show that the total number of traffic accidents of all kinds reported by the five divisions of the railway were reduced from a total of 743 during the month of December to 594 during the month of January, 1921. This is a net decrease of 149. This fine record was achieved through co-operation of the various departments of the railway, each department head being pledged to supervise the "Safety First" activity of his own staff and employees. A prize contest was conducted among the various divisions of the company for the best accident reduction record made day by day.

Divisions	No. of Accidents December, 1920	No. of Accidents January, 1921	Decrease
Piedmont	243	188	55
Savier	161	130	31
Ankeny	192	150	42
Sellwood	129	113	16
Interurban	18	13	5
Total	743	594	149

The accompanying table shows the comparative accident records for the months of December and January.

SPLENDID CO-OPERATION SHOWN

One of the interesting phases of the campaign lies in the fact that automobile drivers of the city seem to have caught the spirit and exerted greater effort toward making a better record. The company's report shows that during December, 120 automobiles bumped into street cars, while in January the number of accidents of this type dropped off to 97.

Reports kept by the employees of the car company on traffic accidents in which the company's cars were not involved also show that there was a substantial reduction. This class of accidents was reduced from twenty-seven in December to thirteen in the month of January. The schools in Portland have also taken an active interest in this subject and have worked with the railway for clean accident records. A booklet entitled "Course of Study for Safety Education in Oregon Schools" has been adopted by the state for use in all schools. This booklet was compiled by H. H. Herdman, the general manager of the National Safety Council of the Oregon and Columbia Basin Division, located at Portland.

The safety work in Portland is in the hands of men of high standing in the community who have the spirit at heart with the will and financial support behind them to make it a real, practical thing.

$335,771 Loss in Operation in Davenport

Rates in Iowa City Go Before Court for Settlement Following the City Council's Refusal to Keep Its Promises

Chance of peaceably settling utility rate problems at Davenport, Iowa, were ruined during the week ended March 5 when the Socialist majority in the City Council voted down a compromise settlement which had been recommended for passage by the city attorney, himself a Socialist, legal counsel specially engaged, and Auditor J. M. McShane of Kansas City.

THIS refusal forces the rate problems into the courts, a proceeding which the Tri-City Railway & Light Company had hoped to avoid. It also caused the withdrawal from the case of Henry Vollmer, the city special legal counsel. In a public announcement Attorney Vollmer declared the traction lines were bankrupt according to the finding of the audit. He held that economies in operation, such as the one-man car and elimination of duplicating trackage, were mandatory. The recommendations of the city's special counsel were based on the comprehensive report of Auditor McShane and appraisal by Burns & McDonnell, Kansas City.

Compilation of these reports has taken six months. The work was undertaken at the order of the Socialist majority in the Council, who wished to have figures for their rate fight against the corporation. When the reports were published it was found that the figures favored the company rather than the city and that higher instead of lower rates were justified.

Some of the figures the Socialists have not yet divulged. These hidden figures are the present day reproduction cost, present day reproduction cost depreciated, and the rates for street car rides, gas, electricity, power and steam based on these valuations.

The valuations which the Socialists did divulge were costs based on the last ten-year average, cost based on ten-year average depreciated and rates based on these valuations. Even these figures indicated the company's rates were too low.

COURT WILL HEAR RAILWAY PLEA

Now that the case is going to the courts the company will plead that rates be fixed on present day reproduction cost depreciated.

Minority members of the Council charged the Socialist majority with bad faith when the compromise rate plan was voted down. They stated that the Socialists had agreed to stand by the figures of the audit, whatever they were.

The present fare is 9 cents, with three tickets for 25 cents, which has averaged 8⅓ cents in operation. The auditor's report showed the company had lost $335,771 for the year ended June 1, 1920, and should have had a fare of $0.089 during that period. In that period a 5 and 7-cent fare was in effect. Since that time trainmen's wages have been raised approximately $55,000 a year.

The compromise plan held for a rate of 8 cents, with two tickets for 15 cents, and provided for one-man car operation, elimination of duplicating lines, elimination of jitney bus competition, various operation economies, such as shortening of loops, and also pledged the city not to increase the company's taxes unjustly.

COMPANY WILL PLEAD FOR RELIEF

There has been no official confirmation of this report, but it is now believed that a 10-cent fare, one-man cars, a drastic cut in operation and dead trackage will be the main points of the company's court case. As the company is already in the courts and present fares are in force by injunction sanction the line of action will be making the present injunction permanent and incorporating in the permanent court order provisions for additional relief.

Company Delays Ten-Cent Fare

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has announced that it will not put into effect the 10-cent fare which it is now privileged to charge in the place of 7 cents. The company applied for an increased rate to the old board of utility commissioners last November. The application was suspended for three months. This period expired several days ago. In the meantime the members of the old utility board were ousted from office. The application of the Trenton corporation automatically became effective at the end of the three months' suspension period.

The protracted wrangle between Governor Edwards and the Senate over the utility board, and the fact that the State has been without a commission since Dec. 27, when the Supreme Court upheld the Governor's right to oust the old board, leaves the company in the peculiar position of deciding for itself whether the 10-cent fare should go into effect. President Rankin Johnson takes the position that the 10-cent fare is absolutely necessary if the company is to continue to operate. The utility law has since been amended and new appointments are expected shortly.

Louisville Petition to Be Abridged

Judge Walter Evans in the U. S. District Court at Louisville, Ky., has ordered the Louisville Railway to trim down its petition bill in which the company seeks to make permanent the injunction restraining the city from interfering with the railway collecting a 7-cent fare. According to the court opinions contained in the bill, from the Louisville Auto Club, Board of Trade, Engineers and Architects Club and numerous others, as well as a long recitation of fares paid and conditions in other cities, are irrelevant to the case in hand, which should be made to conform with the equity rules. The railway has until March 11 to amend its petition.

CITY WILL FILE BRIEF

The city of Louisville expects to file a brief in the U. S. Court of Appeals at Cincinnati on March 7 with the hope of getting the appeal heard before March 19, on which date the court will adjourn until April 5. An effort is being made by the city to get immediate disposal of the suit and to secure an order from the Cincinnati court, forcing the railway to give receipts for overpayments in fare, until the case is decided.

It is shown that for the first four days under the 7-cent fare the average increase in earnings was 18.49 per cent.

Longitudinal Seats for Safeties

A few weeks ago the City Commission of Trenton, N. J., called upon Peter Witt to assist in solving the service difficulties of the Trenton & Mercer County Traction Corporation and to recommend improvements. During the investigation the Birney safety car was subjected to criticism. The chief difficulty was found to lie in the time lost in loading and unloading at heavy traffic centers. The narrow aisle in this type of car renders it difficult for passengers to make their way from the rear and alight at the front when the car contained a load of from forty-five to fifty passengers. This difficulty discouraged riders from moving to the rear and resulted in further aggravating the situation by massing large numbers at the front end of the car.

Many suggestions were made for remodeling the one-man car, and one, that of changing the cross seats to longitudinal seats, is being tried. A car has been remodeled and placed in service. All cross seats have been removed and a longitudinal seating running the entire length of the car body has been substituted. The seating capacity remains the same and the aisle width has been increased from 22 in. to 50 in. Six handstraps are attached to the roof ribs on each side of the car for the convenience of standing passengers. A slight relocation of the sanding box hoppers was also necessary.

The remodeled car has now been in service since the first week in February and public opinion is somewhat divided as to its suitability and no definite indorsement or disapproval has been made. From the operating department's point of view, however, this seating arrangement is ideal for the Birney car as it greatly facilitates the loading and unloading at times when the car has its maximum load of fifty passengers. Present indications are that this seating will be adopted for all Trenton cars in this class of service.

Expert Offers Solution

Suggests Bus-Trolley System at Bridgeport—New Relationship Would Mean Co-operation

Another solution of the Bridgeport trolley tangle was offered recently by John Bauer, New York, before the Bridgeport Chamber of Commerce. Mr. Bauer's scheme is a bus-trolley system under partially municipal management. He believes that a jitney-trolley combination would be a step toward solving not only the transportation problem in Bridgeport but in practically every city throughout the country. His first step would be a thorough investigation into the finances and operating costs of both the electric railways and jitneys by engineering and financial experts.

PLAN OF REORGANIZATION OUTLINED

In the matter of reorganization he suggested dividing the State of Connecticut into several railway districts with the establishment of a separate Bridgeport district. For this district a new operating company would be organized to lease all the railway lines in the district and to receive an exclusive bus franchise. The company should be directly controlled by a board of five directors consisting of one representative of the existing Connecticut Company, one representing the Public Utilities Commission, two from the city of Bridgeport and one representing other communities adjoining Bridgeport.

Mr. Bauer said that the crucial point in the reorganization would be the valuation on which the rentals were based. This should be determined according to present conditions, recognizing the buses as a factor, and that many existing railways will have to be abandoned or supplemented by buses. The new system would make provision for flexible fares and for any adjustment of fares that may be desired with changing conditions. Special provision of amortization of existing investment would also be made during the period of the lease so that at the termination the property would go free of further cost to the district. In conclusion Mr. Bauer said:

> The proposed system obviates the evils of direct municipal ownership and operation, but does maintain proper municipal control. It avoids also the evils of private ownership and financing and would place the transportation system upon a permanently solvent basis, with sufficient flexibility to provide for future needs of service and for an adjustable rate of fare according to changing conditions. When the proper relation of buses and street railways has been satisfactorily determined, there should not be competition between the two but co-ordination.

Paterson's Jitney Reply Unsatisfactory to Railway

The city of Paterson, N. J., has met the Public Service Railway's warning of withdrawal of service by declaring that the question of joint use of public streets by trolleys and jitney buses is one for state legislation and Public Utilities Board control.

The reply of Mayor Van Noort was as follows:

> As a result of a conference between the Mayor and the members of the Board of Public Works regarding the trolley-jitney question the following was the unanimous conclusion:
>
> The whole question of the joint use of public streets by the street railway and the jitney buses is a matter for state legislation and the control of the State Board of Public Utility Commissioners. Pending the passage of such legislation, and in order to relieve the present situation to some extent in our city, we propose the following action:
>
> No further jitney licenses shall be issued within the city limits, and any transfers which may be made in the future will involve the removal of the bus from the present lines to streets not directly competing with the railway.
>
> The belief of the Mayor and the members of the Board of Public Works is that this action will prevent any further addition to present congestion, and will, in the course of time, eliminate it.

As noted in the ELECTRIC RAILWAY JOURNAL for Feb. 26, page 423, President McCarter of the railway notified the Mayor that operation of the railway would be terminated unless the destructive competition of the jitneys was eliminated by the city authorities. The railway does not consider the reply of the Mayor to be satisfactory, but in view of legislation pending at Trenton under which a statewide policy of dealing with the jitney may be laid down, the railway company will await the result of action at the state Capitol at Trenton before it makes any further moves.

Cleveland Still Slashing Expenses in Effort to Break Even

Service on the lines of the Cleveland (Ohio) Railway is being slashed and further reductions in the salaries and wages of all officers and employees are contemplated, because of the fact that the company's interest fund, which is the fare barometer, has been completely wiped out and the company has no means of getting additional revenue as the highest rate of fare permitted under its franchise, 6 cents and 1 cent for transfer, is being charged at the present time.

The company's interest fund on May 1 a year ago contained $603,369. On Jan. 1 of this year, it contained only $39,913, and on Feb. 1 there was a deficit of $3,928 owing to the falling off in the number of passengers being handled by the company.

John J. Stanley, president of the company, and Fielder Sanders, City Street Railway Commissioner, both say that they do not desire any effort to be made at the present time to amend the franchise so as to boost the rate of fare above the 6-cent mark, but prefer to make use of both the alternatives of reducing the expenses and slashing service.

A 10 per cent reduction in wages went into effect on Feb. 1 for all officials and employees of the company, except motormen and conductors, who have an agreement on wages until May 1. The trainmen have already been informed, however, that on that date they will have to accept a 15 per cent reduction in pay.

Transportation News Notes

Asks Two Fares.—Lindley M. Garrison, receiver of the Brooklyn, Queens County & Suburban Railroad, recently applied to the Public Service Commission for permission to collect two fares on the Metropolitan Avenue surface line between Flushing Avenue in Brooklyn and Jamaica Avenue in Queens. The receiver now wants to resume operation on that part of the line between Jamaica Avenue and the Metropolitan Avenue station of the Myrtle Avenue elevated railroad in Ridgewood and to make this a second fare zone.

Interurban Fares Advanced.—Upon order of the Public Service Commission increased passenger fares went into effect on March 1 on the Seattle-Renton interurban road operated by the Puget Sound Electric Company. The new schedule of fares increases the round-trip to Renton from 28 to 35 cents, with similar advances to other points on the line. Books of commutation tickets are sold at a reduction from the one-way fare. The new tariffs increase commutation tickets for regular riders 10 per cent and increase trip fares about 25 per cent.

Would Continue Zone Fares.—The Yonkers (N. Y.) Railroad has recently applied to the Public Service Commission, Second District, for authority from April 19, 1921, to continue to collect fares on the present basis or zone system. Besides the application of the Yonkers Railroad, similar requests have been made by the Westchester Electric Railroad, and the New York, Westchester & Connecticut Traction Company. With the papers were filed the amounts alleged to be deficits as of Dec. 31, 1920, as follows: Yonkers Railroad, $1,239,143; Westchester Electric Railroad, $1,614,015; New York, Westchester & Connecticut Traction Company, $98,398.

Seven Cents in Lafayette.—Fare rates in the city of Lafayette, Ind., were increased on March 3 from 5 cents to 7 cents by order of the Indiana Public Service Commission. The increase of 2 cents went into effect on March 6 at midnight and will remain until further order of the commission. The order also provides that four tickets should be sold for 25 cents. The Lafayette Service Company, which operates the street car system in Lafayette, had asked for a cash fare of 10 cents. The company further is ordered to file with the commission and the city officials of Lafayette, every sixty days, a report of its receipts. The Lafayette petition for increased rates was referred to in the ELECTRIC RAILWAY JOURNAL issue of March 5.

Personal Mention

Mr. Kipp Succeeds Mr. Beason on Utah Road

Ross Beason, traffic manager of the Salt Lake & Utah Railroad Company, Salt Lake City, Utah, which is generally known as the Orem electric line, resigned his position with that company on March 1 to engage in the investment banking business. He will head the newly organized firm of Ross Beason & Company, with offices in Salt Lake City and New York. The new firm will confine its activities to the purchase and sale of railroad, utility and government bonds. Mr. Beason, however, will continue to be identified with the Orem electric railroad, as vice-president and a director.

Mr. Beason has been with the Orem lines for seven years. He is a native of Birmingham, Ala., and went to Salt Lake City in 1912. He was at first connected with the Denver & Rio Grande freight department in Salt Lake, and after a few months became traveling freight agent of the Rock Island lines. After a year with this road he became identified with the organization of the traffic service bureau of Utah. He was manager of this bureau until 1914, when he went with the Orem lines.

Mr. Beason has been succeeded as traffic manager of the Orem lines by A. V. Kipp, formerly general freight and passenger agent. The position which Mr. Kipp vacates has been abolished.

J. F. Keate, who has been chief clerk for the railroad company in the traffic department for some time, has been promoted to commercial agent.

Mr. Whitley Succeeded by Banker

C. W. Whitley, who recently resigned as president of the Utah Light & Traction Company, Salt Lake City, Utah, has been succeeded by E. O. Howard. Mr. Whitley, who was formerly general manager of the American Smelting & Refining Company, a Guggenheim property, has left the railway field and has recently been promoted to a broader field of activity with the head offices of the Guggenheim interests in New York.

Mr. Howard is president of Walker Brothers, bankers of Salt Lake City, who have one of the largest and oldest banks in the West. He has been connected with this bank for a great many years and is one of Salt Lake City's most prominent business men. Mr. Howard's part in the administration of the traction company's affairs will probably not be very active, but he will serve in a more or less advisory capacity.

The Utah Light & Traction Company is a consolidation of the Utah Light & Railway Company and the Salt Lake City Light & Traction Company. The road operates about 146 miles of track and connects Salt Lake City with Murray, Sandy, Midvale and several other suburban towns.

Mr. Kelsey Wins Doherty Prize

E. R. Kelsey of the Toledo Railways & Light Company, Toledo, Ohio, recently received a pair of cuff buttons engraved with the Doherty emblem as the first prize from the Doherty Company for the best five-minute talk on thrift. Mr. Kelsey, himself an investor in Doherty securities, expresses his confidence in the following paragraph:

> The present is an especially favorable time for public utility stock investment, because of the new confidence people have in such business as shown by the favorable treatment accorded public utility companies almost everywhere by public service commissions and the general public. There can be no doubt but that an era of fair play for our public service companies is dawning and that for the first time the people are beginning to realize the great worth of such companies.

Charles Lentz, chief dispatcher, succeeds Mr. Smith as trainmaster of the Indiana Service Corporation, Fort Wayne, Ind. David Overholtz of Logansport, for some time dispatcher on the Lafayette division, goes to Fort Wayne as chief dispatcher.

E. B. Harris, formerly clerk of the Riverside County (Cal.) board of supervisors, has joined the Los Angeles Railway as investigator of litigated cases. He succeeds J. H. Sheridan, who has been with the claim department for four years, and who is now transferred to the operating department to take charge of the employment and instruction work.

Karl B. Crawford, formerly superintendent of the Ohio Gas & Electric Company, Leetonia, Ohio, has been appointed superintendent of the Camaguey Electric Company, Camaguey, Cuba, which owns and operates the Camaguey Tramways Company. Previous to his service with the Ohio Gas & Electric Company, he was connected with the Electric Railway Improvement Company, Cleveland, Ohio, and the Westinghouse Electric & Manufacturing Company, East Pittsburg, Pa.

Frank A. Heermans of Mattoon, Ill., has been appointed assistant secretary of the Public Utilities Commission of Illinois to succeed G. E. Doying of Jacksonville, Ill. The resignation of Mr. Doying was made necessary following the organization of the Peoria-Springfield Motor Transit Company, in which he took a leading part. The Illinois public utility law prohibits any member or employee of the commission from holding at the same time a position with a public utility company.

Charles F. Muller, for the past four years assistant general manager of the Utah-Idaho Central Railroad, Ogden, Utah, has resigned. Mr. Muller has accepted a position with the Bee Hive Advertising Company at Salt Lake City as assistant general manager. Mr. Muller will be succeeded by David S. Romney, formerly traveling freight and passenger agent of the Bamberger Electric Railroad at Salt Lake City. Mr. Romney has been connected with the Bamberger road for the past seven years.

Obituary

Peter Buss, for many years supervising head of the buildings department of the Brooklyn Rapid Transit Company, died on Feb. 15, following an operation. Mr. Buss was born in 1860 in Emden, Germany, and formerly lived in Richmond, Staten Island, where he was a carpenter and builder. He entered the service of the Nassau Electric Railroad, Brooklyn, before its lease to the Brooklyn Rapid Transit Company.

Morton D. Dawson, one of the men who organized the Broad Ripple Traction Company, Indianapolis, Ind., died recently at his home in that city after an illness of several months. Mr. Dawson was for a number of years superintendent of the Broad Ripple Traction Company, a property now jointly operated by the Indianapolis Street Railway Company and the Union Traction Company. During the war Mr. Dawson served as an official on one of the draft boards in Marion County, Indiana. He was fifty-seven years old.

Dr. Charles H. Lemon, for more than twenty-five years chief surgeon of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., died suddenly on Feb. 22. Death was caused by a stroke of apoplexy which occurred while Dr. Lemon was being prepared for an operation for appendicitis. Dr. Lemon was born in Philadelphia in 1863. He attended the University of Pennsylvania and later studied medicine and surgery at the Rush Medical College, Chicago. Soon afterward he became connected with the Milwaukee Electric Railway & Light Company as chief surgeon. About ten years ago when the employees of the company organized the Employees' Mutual Benefit Association or the E. M. B. A., as it is familiarly known in Milwaukee, Dr. Lemon was chosen its medical director. Under his guidance and supervision this association achieved a foremost position with respect to the medical and surgical benefits given its members and their families. At present the staff of doctors and nurses cares for about twelve thousand persons. Dr. Lemon's work in industrial medicine and surgery had been largely along original lines and had served as a model for others.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Lower Prices on High-Tension Insulators

Although Buying Is Rather Light Stocks Do Not Exist and Shipments Rule Quite Long

Since the middle of February four of the large manufacturers of high-tension porcelain insulators have reduced prices on their product approximately 10 per cent. Not all insulators are included in the drop, however, nor has every manufacturer fallen in line with this reduction as yet. The lower price applies to all suspension units and to all multi-part pin-type insulators. Single-piece pin-type units and strain insulators are not included in the price revision. The first manufacturer to announce a price reduction made the drop effective Feb. 15. Cuts by other producers followed at intervals of from four to six days until the last decrease to be announced thus far took effect on March 1. Other manufacturers are expected to take similar action before long.

Deliveries Show Improvement

Present buying in this field throughout the country, on the whole, is light. Deliveries as a consequence are improving, though but slowly. Stocks of the finished product apparently do not exist anywhere, and nearly all the manufacturers still have such a large volume of back orders hanging over from the previous period of strong demand that shipments will very probably continue to rule long for some time to come. In general, manufacturers are quoting deliveries of high-voltage pin-type insulators on an average of four to five months. Suspension units, on the whole, are in a little better shape as regards delivery. There are, of course, variations both considerably above and below this average with some manufacturers.

Boston Elevated Loses 49 Cars in Second Disastrous Fire

Following the destruction of 40 cars in the Neponsit carhouse fire of the Boston Elevated Railway on Feb. 21, the latter company has again suffered a disastrous loss by fire which destroyed forty-nine cars and two-thirds of the Amory Street carhouse in Roxbury, Mass., on March 4. The burned rolling stock included twelve 25-ft. motor cars, three 20-ft. and fourteen 25-ft. articulated cars, ten center-entrance motor cars of the latest type, six one-man cars, two sprinkler and two sand cars. A brick fire-wall saved a portion of the structure covering about one-third of the total area. Precautionary measures such as fire drills and special bulletins which had been instituted by the company following the Neponsit fire proved their value in the good work performed by employees in saving the newest and most valuable cars. Only a small percentage of the later types of cars assigned to the Amory Street carhouse were burned. By the drafting of cars from other divisions service was maintained with little inconvenience to the public. The total loss is variously estimated between $300,000 and $400,000, while the loss in the previous fire, it is now stated, totaled about $650,000.

Little Activity in Pole Buying for Spring

Winter Production Below Normal Because of Little Snow, Large Stock and Light Demand

Producers of Western red and Northern white cedar poles report that the market remains quiet. Spring buying has not yet been in evidence to any extent, though central stations are taking more interest, it is true. Their needs as yet have not advanced beyond the estimating stage, however, while electric railways have given no intention at all of buying. Despite this rather dilatory action of consumers in covering their needs for spring construction work, producers are confident that the year as a whole will show good sales. Expectation of price decreases, it is said in some quarters, is one factor in delaying buying as present quotations of poles represent their peak price.

Fewer Poles Cut This Winter

Production of poles this present winter has not been so large as in other seasons. For one thing, there has been a comparatively light snowfall in the regions where dependence is placed upon snow for hauling; and in the second place sizable stocks, light demand and the possibility of a price decrease are said to have operated against a heavy cut of poles.

Good stocks are held at distribution points at present so that shipments are made from stock. An Eastern consumer can therefore count on obtaining poles in from two to three weeks from the date of his order. Representative producers' prices for Western red cedar poles are as follows: 30-ft., 7-in. top, f.o.b. Chicago, $10.90, New York, $12.20; 35-ft., 8-in. top, Chicago, $16.25, New York, $18.30; 40-ft., 8-in. top, Chicago, $19.80, New York, $22.40. Northern white cedar prices are as follows: 30-ft., 7-in. top, f.o.b. Chicago, $11.60, New York, $12.50; 35-ft., 8-in. top, Chicago, $19.05, New York, $20.75; 40-ft., 8-in. top, Chicago, $23.95, New York, $26.15.

Production Off Under Lower Steel Prices

Independent Mills Widening Spread Between Their Prices and Corporation Prices to Stimulate Buying

In an endeavor to provide employment for their workers and to work off inventories which have been marked down many independent mills have marked down steel and iron prices so that the spread of prices between corporation and independent producers is becoming more marked. None the less, this cutting has had little stimulating effect on buying. Large and small producers alike are feeling the effect of the buying decline. Even the ordinary run of business that comes from regular channels is being held up.

In virtually every section of the steel country furnace and mill operations are being reduced. Here and there are reports of an improvement in operations, but they are entirely local. At the same time, some independent mills are piling up stocks of iron for reserve. Sheet production is very low and tube production is rapidly declining. The latter fact may have some effect on electrical conduit, as at least one company has just put through a reduction on tubular goods of from $8 to $10 per ton. It is the hope of this producer that the reduction will bring in orders sufficient to run the plant at a little better rate than the existing one, which is lower than ever before.

Prices Not Always Definite

These price reductions in the independent mills have brought iron bars to from 2.70 cents to 3 cents, Pittsburgh, as against a former quotation of 3.06 cents. A cut of $5 a ton under the minimum price of two weeks ago offered on galvanized sheets brings this quotation to 5.10 cents. The upper price is 5.70 cents. Black sheets can be had at 4.00 cents, a slight recession only from a former minimum of 4.15 cents. But the whole industry is so anxious for trade that it would not be surprising to find recessions even from these prices. Bar, shape and plate prices have held quite level for the last week, the minimum on bars being 2 cents, on shapes 2.20 cents and on plates 2.10 cents. These, it is believed, could also be shaded.

According to Judge E. H. Gary's statement at the February meeting of the American Iron and Steel Institute, steel prices will not be reduced at present, nor is a cut in wages in the steel industry being considered at this time by the United States Steel Corporation. Even in view of the above it would not be surprising to find not only a reduction in wages but also in steel prices by the corporation in the near future.

Wages, it is generally known, have been very generally reduced throughout the independent steel industry, following which the mills reduced their prices. Consequently any reduction in corporation wages would be expected to presage a reduction in price of finished and semi-finished products.

Crossarm Prices Again Reduced

Reductions of 9 to 15 per Cent Effective March 1—Demand Light and Supply Good

Price decreases on Rainier fir and longleaf yellow pine crossarms varying from 9 to 15 per cent are announced by representative producers effective March 1. This is the second decrease within a month, the first amounting to 15 per cent and becoming effective on Feb. 1 as stated in the Feb. 5 issue of ELECTRIC RAILWAY JOURNAL. The supply of arms both with jobbers and at distributing yards is reported good, with stock shipments prevailing. Demand remains uneven in different sections of the country and among different producers. On the one hand buying is said to be slow with only a few straggling orders coming in. Some producers, however, state that sales have picked up recently with more inquiries and greater interest being shown in the market by consumers who are looking forward to their spring needs.

PRICES ON REPRESENTATIVE ARMS

Representative prices now in effect on fir arms per 100 delivered, are as follows: Electric light arms, 3¼ in. x 4¼ in. x 3 feet, two pins, less than 1,000 lineal feet, New York $56.99, Chicago $52.57, and 1,000 to 3,000 lineal feet, New York $50.66, Chicago $46.73; 3¼ in. x 4¼ in. x 6 feet, six pins, less than 1,000 lineal feet, New York $113.99, Chicago $105.13, and 1,000 to 3,000 lineal feet, New York $101.33, Chicago $93.45. N. E. L. A. arms, 3½ in. x 4½ in. x 5 feet 7 in., four pins, less than 1,000 lineal feet lots, in New York cost $128.92, Chicago $118.90, and 1,000 to 3,000 lineal feet, New York $114.59, Chicago $105.69. New England arms, 3¼ in. x 4¼ in. x 5 feet 6 in., four pins, lots of less than 1,000 lineal feet in New York cost $113.99, Chicago $105.13, and 1,000 to 3,000 lineal feet lots, New York $101.33, Chicago $93.45.

Locust pins have been extremely scarce for some time past due to insufficient supply of the wood itself. Stocks are now building up, however, under general light demand, and though one or two distributers have none in stock others report as high as 200,000 on hand. Some producers are advising their customers to place orders for pins as soon as possible for present stocks might not last long if demand, which is reported to be on the increase, should mount to large proportions. Current prices of 1½ in. x 9 in. locust pins average from $35 to $40 per 1,000 f.o.b., New York.

Favorable Development of Low-Head Water Powers

During Past Year Many Small Capacity Turbines Sold—With High Fuel Costs Outlook Here Favorable

With the volume of orders for waterwheels and generators placed last year it is interesting to note the large number of small units—from 625 kva. and below—that were sold. In the past small water-power sites have been neglected, it seems, because the larger and more spectacular developments attracted most of the attention. The development of these small projects is now being looked upon more favorably than ever before. This is particularly true among industrial concerns which have available low-head water powers.

The high fuel and transportation costs and the attention that is being given to water-power developments in general, it is felt, will have a great effect on turning public interest on the many little falls that could be developed for lighting, power and railway purposes in small towns.

Machine developments are rapidly tending toward this end. From a financial point of view it is much easier at this time to promote several of these small developments than one of the large ones.

The hydro-electric outlook in general for the coming year seems to be favorable. Although licenses for many large undertakings have been applied for through the Federal Power Commission it is doubtful at this time that many of them, if their applications are approved, can get their finances in shape to go on with the ordering of apparatus.

Spanish Northern Railway to Electrify

The Spanish Northern Railway, Commercial Attaché Cunningham of Madrid reports, will buy through the Spanish Government machinery and equipment for the electrification of part of its line. The government, it is stated, on March 16 will accept bids for the electrification of the municipal railway at Oviedo, at a cost of 7,000,000 pesetas. Bids are also to be opened on April 22 on a contract for a railway extension from Soria to Castejon, the cost of which is estimated at 390,000,000 pesetas. More locomotives and cars, Mr. Cunningham advises, will be purchased soon.

Tenders for Electrification of Railway in South Africa

American Trade Commissioner Stevenson of Johannesburg, South Africa, states that tenders are being invited covering the electrification of the railway from Cape Town to Simonstown and also the section of the Natal main line from Durban to Pietermaritzburg. The project includes substations, boiler house equipment and condensing plant, together with electric locomotives for freight, passenger and shunting services. Bids for these projects are to close May 3. The suburban line, according to present plans, is to be operated on the multiple-unit system, while on the main line large electric locomotives are to be used. Specifications may be obtained from the South African High Commissioner, 32 Victoria Street, S. W., London, England. The cost for the Cape Town-Simonstown line is estimated at £1,464,000, and the Durban-Pietermaritzburg line at £2,921,400.

Rolling Stock

The Peoria (Ill.) Railway Company has received five rebuilt cars from the Decatur shops of the Illinois Traction System for use during the rush hours on the East Peoria line.

Eastern Wisconsin Electric Company, Sheboygan, Wis., has purchased six standard safety cars from the National Safety Car & Equipment Company, St. Louis, Mo., for use in Fond du Lac, Wis.

Springfield (Mass.) Street Railway Company advises that it does not contemplate replacing the 4 snowplows, three double-truck passenger cars and 1 work car destroyed by fire on its Palmer Division last December.

Georgia Railway & Power Company., Atlanta, Ga., has just placed three new pay-as-you-enter cars in service. They embody many improvements over the old type cars, including signal buttons in place of a bell rope, a plunger in the floor for registering fares, wider aisle spaces and narrower platforms. Additional cars will be added later.

The Chicago (Ill.) Surface Lines, mentioned in the Feb. 5 issue as calling for bids on 50 trailers in addition to the fifty other trailers being built in the company's shops, has specified the following equipment on these cars:

Number of cars ordered	Fifty
Date order was placed	Feb. 26, 1921
Date of delivery	In four months
Builder	J. G. Brill Company
Type	Double-truck, closed, center entrance, double-end trailers
Seating capacity	Sixty-two
Weight, total	26,000 lb.
Length over all	47 ft. 6 in.
Width over all	8 ft. 4⅞ in.
Height, rail to trolley base	10 ft. 9½ in.
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Bumpers	Channel
Buzzers	Consolidated Car Heating Company
Car trimmings	Statuary bronze
Conduits and junction boxes	Duraduct
Curtain fixtures	Curtain Supply Company
Curtain material	O'Bannon
Designation signs	Hunter
Door operating mechanism	National Pneumatic Company
Heater equipment	Consolidated Car Heating Company
Registers	International, type R-7
Sash fixtures	O. M. Edwards Company
Seats	20 crossover longitudinal, 2 circular
Seating material	Rattan
Slack adjuster	Gould
Springs	Brill
Step treads	Kass
Trucks	Brill 67-F
Ventilators	Railway Utility natural ventilation equipment
Wheels	22-in. solid rolled steel

Boston (Mass.) Elevated Railway Company states that practically all of the forty cars lost in the Neponsit carhouse fire of Feb. 21 were of the older types, and the company does not anticipate purchasing any new ones to take their place. The company has not as yet decided whether it will be necessary to purchase any cars to replace those lost in the fire of March 4, described elsewhere this issue.

The United Railways of St. Louis, Mo., has not yet ordered new cars specifically to replace the 16 cars which were destroyed in the Debaliviere carhouse fire on Jan. 3. Indirectly, however, the place of the burned rolling stock is being taken by new cars which have for some time been turned out of the company's shops at the rate of about two a week.

Power Houses, Shops and Buildings

Harrisburg (Pa.) Railways.—The report of the Harrisburg Railways recently submitted at the stockholders' annual meeting outlined some necessary improvements and additions. It was suggested that two new boilers of not less than 600 hp. each be installed with a new generating unit of not less than 3,000 kw. capacity. It was also suggested that additional carhouse space be provided as the present facilities were not adequate to house all the company's cars.

Track and Roadway

Alabama Power Company, Attala, Ala.—The Alabama Power Company is making improvements on its Attala car line. Seventy-pound rails are replacing the old 40-lb. ones that were laid when the line was first built.

Meriden, New Britain & Hartford Street Railway, Hartford, Conn.—Since no one appeared in behalf of the Meriden, New Britain & Hartford Street Railway at a legislative hearing recently the charter for this proposed line from New Britain to Meriden through Kensington and the Cat Hold gap route will be permitted to lapse. The charter was first sought from the General Assembly about ten years ago.

Los Angeles (Cal.) Railway.—The Los Angeles Railway will soon begin relaying of tracks with heavier steel and new ties on Central Avenue between Fifth and Fourteenth Streets.

Los Angeles (Cal.) Railway.—A temporary track at one side of the street will be used by the Los Angeles (Cal.) Railway on Hoover Street from Slauson to Sixty-first Street during improvement and change of grade on the main double track. The emergency rail will be used to prevent delay.

Brooklyn, Queens County & Suburban Railroad, New York.—The Public Service Commission has issued an order to the receiver of the Brooklyn, Queens County & Suburban Railroad directing that the tracks of the company on Jamaica Avenue between Rockaway Avenue and Van Wyck Avenue in Queens be rebuilt with new rails. The work must be begun not later than April 1.

Professional Note

John F. Layng, for many years connected with the Railway & Traction Engineering Department of the General Electric Company, Schenectady, N. Y., is leaving manufacturing work to enter the consulting engineering field. His new connection, just announced, is as a partner in the firm of Hemphill & Wells, consulting engineers, New York City. Mr. Layng has been engaged in the electric railway business since 1889, having been at various times connected with operating companies, as well as with the General Electric Company and Westinghouse Electric & Manufacturing Company. During the past five years he has devoted his time to general electric railway analyses and the results of some of his work along these lines have been published in this paper. During the war he was engineer with the United States Fuel Administration in Washington, D. C., in charge of the electric railway fuel saving for the entire country. It was largely due to his efforts that the skip stop was so generally used.

Trade Notes

The Combustion Engineering Corporation, 11 Broadway, New York City, has established a branch office at 521 Candler Building, Atlanta, Ga., in charge of A. A. Hutchinson.

Thomas H. S. Andrews, M. E., until recently on the engineering staff of the J. G. White Engineering Corporation, is now identified with E. G. Long Company as its secretary.

The Maring Wire Company, Muskegon, Mich., manufacturer of cotton-covered and enameled magnet wire, announces the appointment of the Beedle Equipment Company as its representative. The Cincinnati office, at 1309-10 Union Trust Building, is in charge of A. L. Beedle. The Indianapolis office, at 509-10 Lemcke Building, is in charge of F. T. Miles.

Heywood Brothers & Wakefield Company of New Jersey, manufacturer of car seats, has reorganized under Massachusetts laws under the name of Heywood-Wakefield Company, with a capitalization of $13,000,000. The reorganization represents a merger with the Lloyd Manufacturing Company of Menominee, Mich., which manufactures baby carriages. Officers and directors of the company remain unchanged except that Henry Hornblower succeeds John D. Walsh, deceased, as director, and Marshall B. Lloyd is added to the board.

The Chicago Pneumatic Tool Company, New York City, announces the appointment, Jan. 1, 1921, of R. F. Eissler as assistant to the vice-president, with headquarters in the company's new office building at 6 East Forty-fourth Street, New York. W. C. Straub, formerly district manager of the New Orleans branch, has been appointed district manager of the Pittsburgh branch to succeed Mr. Eissler, and Ross Wyeth, formerly attached to the Pittsburgh branch, has been appointed district manager of the New Orleans office in place of Mr. Straub.

The International Clay Products Company, 31 Union Square, New York City, has recently purchased the entire properties, plant, equipment, coal, clay and shale mines of the Clermont Sewer Pipe Company of Pennsylvania and the Kesco Clay Products Company of New Jersey. The Clermont plant covers 400 acres of land and has an annual capacity of 10,000,000 duct feet of clay conduit. Both plants are reported to be operating at full capacity, and complete stocks are carried for prompt shipment. In addition the company carries cable hangers, conduit coupling rods and pick-up tools.

The Westinghouse Air Brake Company, Wilmerding, Pa., announces the appointment of Alexander England as chief engineer to succeed S. W. Dudley, who resigned Feb. 1, to join the faculty of Yale University as professor of mechanical engineering. Mr. England came to the Westinghouse Air Brake Company in the year 1898. He was made chief draughtsman in 1905 and remained in that capacity until his appointment as assistant to Mr. Dudley in 1914. Other changes occurring as a result of Mr. Dudley's resignation and the promotion of Mr. England have been announced as follows: R. E. Miller, engineer of tests and inspection, promoted to superintendent of tests and inspection; W. E. Dean, assistant engineer of tests, promoted to engineer of tests, and A. A. Mackert, chief inspector, promoted to engineer of inspection.

New Advertising Literature

Valves. — The Yarnall-Waring Company, Chestnut Hill, Philadelphia, is distributing a leaflet describing its "Yarway" junior seatless valve.

Battery Test Chart. — The Allen-Bradley Company, Milwaukee, has published a new battery test chart, 14 in. x 31 in., to be used exclusively with the Allen-Bradley rate discharge test set.

Lightning Arresters.—Electric Service Supplies Company, Philadelphia, has issued bulletin No. 175, dated Feb. 15, a catalog of "Garton-Daniels and Keystone Lighting Protective Apparatus."

Portable Electric Grinders and Drills.—The Cincinnati Electrical Tool Company, Cincinnati, has issued catalog No. 14, covering its complete line of portable electrical drills, grinders and buffers.

Insulating Material. — The Boonton Rubber Manufacturing Company, Boonton, N. J., has published a forty-eight-page booklet entitled "Boonton Bakelite," in which it describes and illustrates the method of manufacturing bakelite and its uses.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

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American Association Headquarters Situation Is Well in Hand

THERE is no reason for discouragement in the mix-up in the finances of the American Electric Railway Association disclosed by the audit of the treasurer's books now under way. While this is disconcerting for the moment, the association and the industry will benefit ultimately, due to the thorough analysis of operating methods which will at once be undertaken. The association work has expanded enormously within a few years and demands upon it have increased by leaps and bounds. The membership has responded generously with funds, but the work to be done grew faster than the machinery for doing it. This condition will be remedied. In the meanwhile, the essential activities will go on unhampered. The industry is behind President Gadsden and his colleagues to a man. If funds run low for a time, provisions will be made to finance the work. The association is recognized as vital to the industry. The present losses, while intrinsically large, are comparatively insignificant. Close ranks! Forward, march!

The Metamorphosis of the Electric Railway Shop

THERE is no question but that the maintenance shops connected with electric railway properties are undergoing a gradual but very noticeable evolution. This fact has been particularly impressed upon the men responsible for the preparation of this annual maintenance issue of the ELECTRIC RAILWAY JOURNAL.

The changes which have been brought about are due to many causes, not the least of which is the improved quality of equipment supplied by manufacturers. While it is true that some of the older equipment has made wonderful records for durability, the new equipment is superior in most characteristics. Take, for example, the motor. In this case the designers, by reducing weight, increasing overload capacity, eliminating sparking, etc., have put the modern motor in a class quite distinct from that of its predecessor. The manufacturers deserve credit for this achievement, although they have undoubtedly been influenced by complaints and constructive suggestions from their customers. Along with better motors have gone also better car bodies, trucks, controllers, heaters and the hundred and one details which go to make up a complete car.

The master mechanic comes in for a large share of the praise for improved shop practices in that he has recognized the opportunities afforded by new developments. For instance, he now dips and bakes armatures and field coils, where he did not deem this necessary or practicable some years ago. In one case at least he is dipping and baking the entire motor shells with field coils in place. Possibly in addition he is using an impregnating outfit in connection with his insulation program. He is slotting his commutators also, and he is certainly using better tools and adapting the tools to the work more skillfully than ever before.

As to reclamation work, the very mention of the term is enough to arouse enthusiasm. The possibilities of electric, gas and thermit welding and of gas and electric cutting are limitless. The reclamation department now has its established place, just like the forge shop, the wood mill or the paint shop. The writer visited one shop recently in which the welding, blacksmith and sheet-metal shop are combined in the reclamation department with an expert in charge, the work of these shops being so inter-related in modern maintenance work as to make this combination the most desirable administrative arrangement.

No Steam Railway Supply Exhibit at Atlantic City This Year

THE executive committee of the Railway Supply Manufacturers' Association has announced that the usual exhibit will not be held in connection with the annual convention of the mechanical section of the American Railway Association at Atlantic City in June. Such action has precedent, for during the war period the convention, exhibit and all, was suspended for patriotic reasons. Now the condition of the railroads and of the attendant supply business is such that regardless of the loss which the omission entails a drastic procedure is considered justified. The exhibit will be greatly missed, although the omission is no doubt warranted under present conditions. It seemed like old times during the past two years to hear the merry hum of wheels and the buzz of cheerful discussion on the pier at Atlantic City, presaging better times for the railroad business. The convention of the railroad men will now be a comparatively quiet affair. While the technical sessions and social affairs will be well worth while, they cannot but be adversely affected due to the absence of the exhibit "fans."

Electric railway men will naturally ask themselves whether this action of the railroad men will or should affect their own plans for the fall convention. It need not do so unless they are looking for a precedent for omitting exhibits. The manufacturing concerns in this field are to a certain extent the same as those making the decision to omit the June exhibit. However, the situation in the electric is different from that in the steam railway field, and in some phases it is better. Fares are rising and expenses receding slightly, and forward-looking transportation men feel sure that the trough of the wave of depression has been passed.

Under the present organization of the American Association, it is the railway men who decide the matter of exhibits, while the reverse is at least nominally true in the steam railway field. But obviously the exhibits would be a fizzle unless a large number of supply men co-operated. At the same time the railway men would not wish to exert undue pressure on the manufacturers to spend money unprofitably on the convention. It is to be hoped, however, that the plans for the American Electric Railway Association convention can be carried out. Possibly the supply men can afford one exhibit this year, and fortunately the supplies required for the October convention are much less expensive to exhibit than those which are usually gathered together for the inspection of the steam railroad men in June.

Paying for Work Done, Not Time Put In

SEVERAL reasons stand out as contributing conspicuously to the success attained in the shops in Milwaukee with a premium system of pay, which is treated in the article by J. H. Lucas elsewhere in this issue. They are considered worth this special summary:

Great pains are taken in setting up the standard time allowance on a particular job and then this standard rate is never changed. Extra pay is commonly earned, and it is received promptly with the semi-monthly pay. The check-up on the man who fails to equal the standard time brings to light any unfair condition and acts as a spur to the poor workman. The workmen like the system, because if they have skill it brings them immediate recognition, and as their confidence in the system has been gained, they are not afraid to display it. The possibility of poor workmanship because of too much speed is eliminated by a thorough inspection system. The amount of record-keeping by the workman is very small, as is also that of the clerical help required to handle the record system in the head office. The foreman is rewarded in proportion to the amount of work he gets done on a premium basis, so that he is interested in extending the plan. He does not profit from any excess earnings of the men, nor does he profit from standard rates set too low. The rate is subject to his approval and he is interested in having this rate perfectly fair.

After six years of experience in the Milwaukee shops, Mr. Lucas' views of the general worth of some such system of rewarding labor in proportion to the work done are of unusual value. In discussing the subject in a broad way with the writer, he made this significant remark: "Let the electric railways install the Taylor system, piecework, profit-sharing or whatever they will, just so they get away from the hopelessly degrading influence of the plan of flat hourly pay for labor regardless of the individual capability, which unionism has succeeded in forcing so far forward in the last few years."

Seemingly, there never was a time more propitious than the present for the introduction or revival of efficiency methods. Managements are seeking for economy and labor is in a mood to receive with favor any scheme that will assist in retaining the present earning ability. Wages cannot be cut without calling immediate attention to the reduction of rates of fare, but there is a possibility of reducing costs through better efficiency and thus recoup past low earnings for a while. And anyway, far-seeing managements are not anxious to reduce the earnings of their employees if they can find a way to justify the present high labor expenditures, for there is a very direct economic advantage to a company in having employees who earn high wages.

During the last few years wages have increased to double and treble what they were before the war, and yet in many instances the output has been cut in two. We recall one instance where unionism forced a change in a large shop from an extensive use of piecework to the flat hourly pay basis, with the result that the total earnings of many of the employees were substantially reduced and the maintenance costs of the company were increased on the average 75 per cent, and on some work as much as 200 per cent. It should be said in this connection that the unionization of the shop is understood to have been largely a matter of coercion, for 85 per cent of the men did not want the change.

In Milwaukee the premium system proved to be the most valuable bulwark against this cutting of production. The standard rate held firm, and while the amount of non-premium work increased during the time of inefficient labor, the company had the records and knew whom it was best to lay off when the time for retrenchment came.

Too many of the "old timers" in our business are afraid of "efficiency" or the "efficiency engineer." But the results of a common-sense study of the work done in any shop, looking toward a systematic and organized routine, will bring to light so many possible economies, so many existing inaccuracies and wastes, that the saving will probably be startling. Altogether, we feel that Mr. Lucas' estimate of 25 per cent as the saving realized by the company is a very modest claim. And with such possibilities in sight, present business conditions make this an excellent time to go after better labor efficiency in the shop and elsewhere.

How Can Maintenance Costs Be Reduced?

JUST now electric railways are facing the problem of maintaining their equipment with little money. An easy way of offsetting the decreased revenues is by making drastic reductions in maintenance expenditures. Shop forces all over this country are engaged in patching up the various parts of equipment in order to make them last a little longer, and the need for additional rolling-stock is being met by rebuilding obsolete cars. All realize that this is but a temporary expedient and that efficiency and ultimate economy are being sacrificed, but the reduction of maintenance expenses is absolutely necessary for most roads just now. Some of the means by which maintenance expenses can be reduced on a sane basis are by doing away with waste labor and by increasing the present output of the shop equipment available. Waste labor is due to lack of proper supervision and looseness of organization. To obtain the best results, maintenance work must be planned systematically. There must be closer supervision of the workmen and of the materials used, and attention must be given to the proper distribution of the limited material and supplies available so as to bring about the most efficient results. Another factor tending to produce this looseness of organization is the uncertainty as to just what should be undertaken in the year's program. Only through a general supervision, so that all departments can be made to co-operate closely, can the greatest economy be obtained.

For the moment, the installation of new and efficient machinery seems out of the question on most roads, but the present shop equipment should be made to serve its purpose more effectively. One method by which machinery output can be increased with the present equipment is by the application and use of time-saving jigs and fixtures. A detailed study of the individual jobs will show what operation is consuming the most time. In many cases a little ingenuity will suggest some simple jig or fixture which will materially reduce the time and thus produce a substantial saving. Present shop efficiency on a man-hour basis is entirely too low, and the present reductions in shop forces make it all the more important to increase by every possible degree the morale of the men. Men who show the proper interest in their work should be advanced consistently, and they will be found to work more earnestly and enthusiastically. A careful consideration of such questions as these will undoubtedly provide for getting better and more service from all the important factors, men and machinery.

The Present Trend of Way Department Affairs

WHILE the activities of way departments were restricted during 1920 there was a distinct improvement in them over 1919. There was a 25 per cent increase in amount of new track built and the amount of track rebuilt did not fall below that for 1919. There is encouragement in these facts, particularly in view of the continuation of the high prices for rails and other construction materials which prevailed during 1920. It would not have been surprising if the track activities had fallen below 1919; but actually they more than held their own.

Prices are now on the decline, due mainly to the reduction in labor cost which has been gathering force in all lines of endeavor. Much more favorable conditions are found in the track labor market and some companies have cut this item by 20 per cent. The signs point to even greater reductions. Meanwhile the track payrolls are at a minimum just now and no maintenance work other than that of the most urgent nature is being carried on.

With the decline in costs for labor and material will come an enlarged opportunity for expenditure on track projects which are urgently demanded by the deferred maintenance which has been piling up. Combined with the betterment of fare conditions which is gradually making headway, the reductions in costs should lead to greatly extended track programs and the year 1921 promises to be one of increased activities in the way department.

A greater amount of attention was paid last year to the fact that tracks may often be overhauled and put in serviceable condition to cover a period of five years or more at a reasonable cost and without complete reconstruction. The answer to the question, When is a track worn out? has been sought carefully and some surprising results have followed. This paper has recently published several articles describing methods of rehabilitation of apparently wornout tracks and an inspection of some of the jobs described leads to the conclusion that a careful study of the economics of track life on any property will tend to convince engineers of the unwisdom of considering tracks as worn out and needing complete renewal until every angle of investigation and computation has been exhausted.

The extent to which the arc welder and rail grinder have been used in prolonging the life of tracks and special trackwork has been constantly observed during the past year. These two pieces of apparatus may lay claim, unchallenged, to pre-eminence as labor and expense-saving devices. Meanwhile there have been several developments in labor-saving devices which indicate that the end is not yet in sight and that way engineers are still capable of reducing costs. The motorization of the way department is on the increase. Cumbersome, time-consuming work cars and horse-drawn vehicles are being replaced by suitable motor trucks. By means of these, costs for handling materials are being greatly reduced and work is speeded up owing to the more frequent service obtained. A particular development along this line is the motor truck carrying a crane for handling heavy material.

An increasing tendency toward the use of substitute ties for tracks in streets has been noted and there is no doubt but that there is a field for them. However, there is a current of opinion prevailing which suggests that track engineers should investigate the design of such ties more carefully with the view toward determining results obtained from existing designs and attempting to guide the design along proper channels in accord with good engineering principles.

An Important Job—That of the Equipment Engineer

ON AN increasing number of electric railway properties a functionary who is proving himself a money saver is the equipment engineer. He differs from the master mechanic in that, in general, he has no routine duties of an administrative nature, and preferably he is a man who has had both theoretical and practical training. His function is to solve equipment problems of a technical character, and he has for his principal duty that of locating opportunities for savings. Another thing that he can do is to work up in economical and practical form the suggestions which the master mechanic, the foremen and the skilled workmen make to him from time to time.

Every practical man on a railway property knows that there are wastes going on around him. Even practices which are not actually wasteful are susceptible of improvement. But to know that there are chances for saving is one thing and to realize on these opportunities is another. It requires more time for the latter than is usually available unless some one is detailed for the purpose and relieved of other responsibility. A first-class man at this task ought, on a property of average size, to earn his salary many times over each year.

There are, of course, many small properties where an equipment engineer is out of reach, or seems so. Then some one else must perform his functions. The master mechanic must do double duty, without, however, letting one part of his work interfere with the other. Care in this respect is needed, for the state of mind required for solving technical problems is quite different from that required for "running" the shop. It is better to have a separate man for the purpose, if possible, even if supereconomies have to be practiced elsewhere to accomplish this.

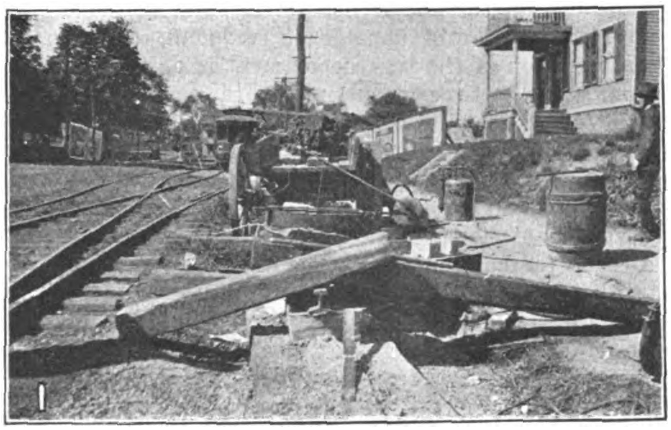
Quotation from the Federal Electric Railways Commission Report

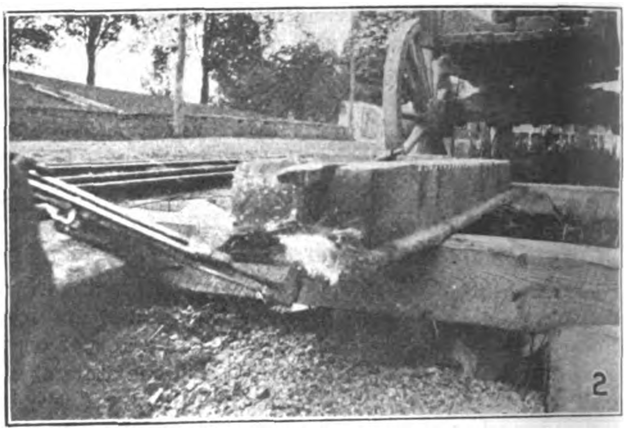
No. 12

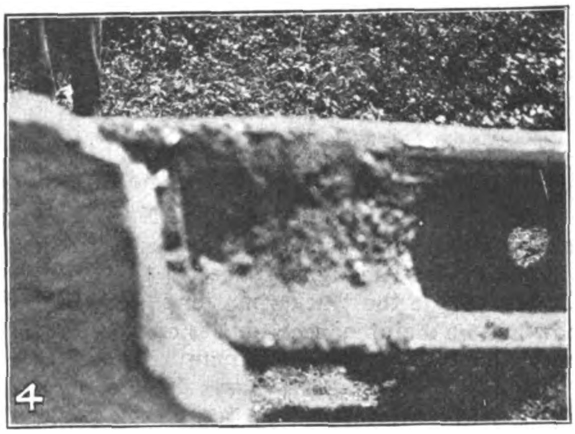
THE labor policies of the electric street railways will in the future be of great importance as an element in the restoration and the permanent maintenance of their credit. The full co-operation of labor is essential to the highest prosperity and usefulness of the industry. This is particularly true because in the case of the street railways the employees who immediately handle the service come into direct contact with the people who consume that service.

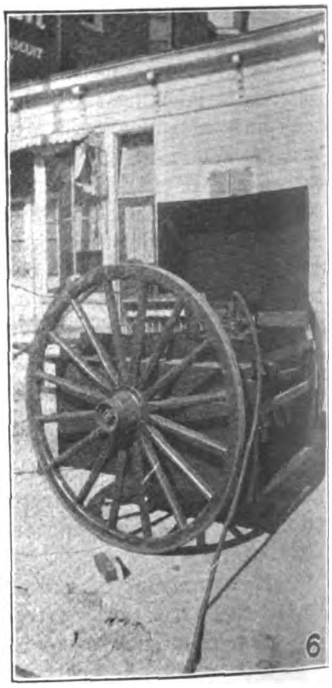
Much can also be done toward reduction in the cost of operation by developing the proper spirit of co-operation with employees.

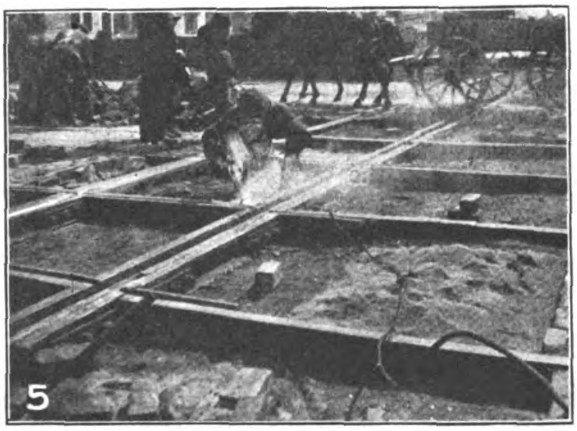
Welding Has Proved a Life Saver for Small Electric Roads

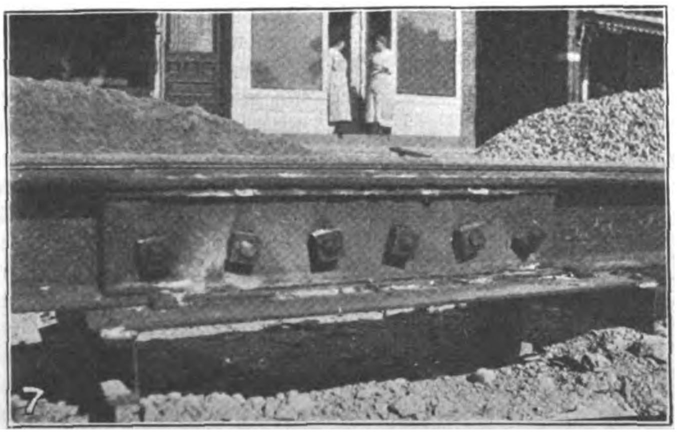


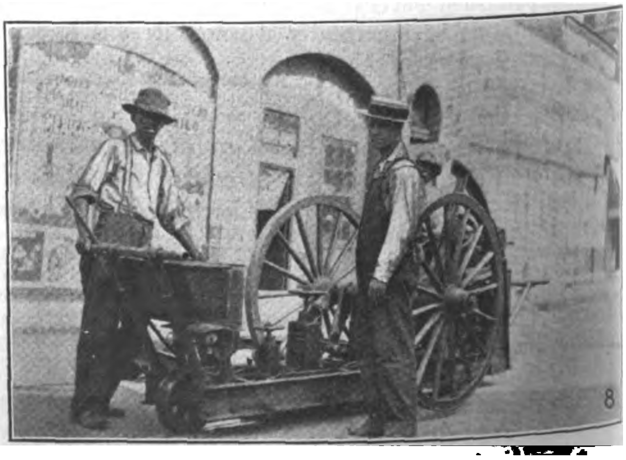












1—Set-up for thermit weld.
2—Cutting cast iron with oxyacetylene to prepare for mold.
3—The reaction taking place.
4—Completed weld before cleaning.
5—Repair to crossing by arc welding.
6—Dynamotor type arc-welding machine.
7—Seam-welded joint on 7-in. groove girder rail.
8—Reciprocating rail grinder.

Track Labor Savers for Small Railway

By A. J. STRATTON
Superintendent Maintenance of Way Eastern Pennsylvania Railways, Pottsville, Pa.

The Application of Labor-Saving Tools and Track Machinery on Small as Well as Large Systems Has Produced Far-Reaching Economies—Also, Tools Will Not Continue to Operate Without Proper Inspection and Maintenance

THE electric railway industry has during the past five years undergone a great shaking up. Economies have been effected that formerly seemed impossible. Materials and labor reached undreamed-of price levels. The acute shortage of both commodities directed the attention of railway executives to means of conserving material and multiplying the efforts of labor. In the province of the track and roadway department the shortage was acutely felt. Tracks that would in times past have been reconstructed were rehabilitated and are functioning today and will continue to do so for years to come. Much of this work, however, would not have been possible had it not been for the use of labor-saving equipment and track machinery designed to prolong the life of the track.

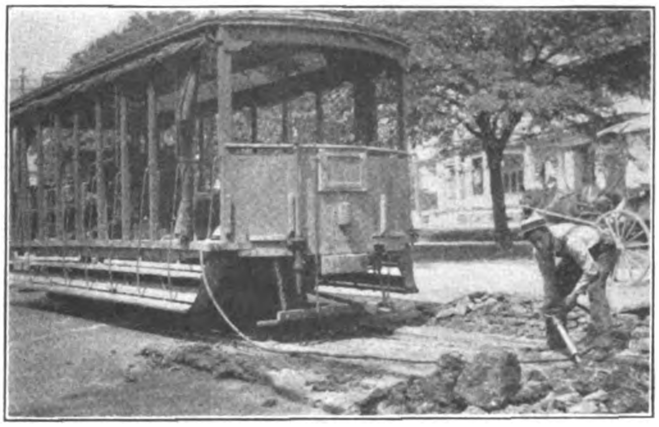
It is not the purpose of this article to enumerate the various labor-saving devices in use on the larger systems of the country. The crane car, the pavement plow, portable welding units, elaborate storage yard machinery and other special equipment have been described many times in the columns of the ELECTRIC RAILWAY JOURNAL. The utility of these tools is not questioned, but the smaller company cannot afford to buy equipment of limited or infrequent use. When new equipment is bought for the track and roadway department the management is usually assured that the tool is going to be in use most of the time during the working season.

WIDE APPLICATION OF WELDING

Probably no tools have contributed more to the successful rehabilitation of tracks than the various types of arc welders. Joints may be welded, cups and dishes filled in, railroad crossings restored, the life of special trackwork prolonged, bonds applied and many other economies effected. The portable grid-resistance type of welder was placed on the market about ten years ago. The wide range of possibilities and the low first cost of the apparatus so appealed to track engineers that almost every electric railway in the country became the possessor of one or more of these equipments. Overindulgence in electric welding during the next few years was convincing, however, that while not a remedy for all track troubles, it had a wide sphere of utility. The introduction of the motor-generator or dynamotor sets further extended the really constructive work that might be accomplished by this process.

The grid resistance type of machine is probably unexcelled for heavy and rugged welding. The absence of moving parts and consequent low maintenance, the portability and the ease of operation are some of the points in its favor. On the other hand, the fact that the rail is always negative with respect to the generating equipment does not permit certain kinds of welding to be done. The fluctuations of line voltage, too, often interferes with production. The metal electrode is most successfully used with this type of machine. The dynamotor type of welder operates with the rail positive to the generator of the machine, making possible the seam weld joint, which is, however, patented. This joint has much to recommend it and is enjoying wide use. The maintenance of this type of machine is more costly than that of the grid-resistance apparatus. The cost of current, however, is much less. The track and roadway department is not, on the majority of properties, charged with the current used by track tools, but for those interested the following data are submitted: On a test to determine the amount of energy required to melt a pound of low-carbon steel, it was found that the grid-resistance type of machine used 10.8 kw.-hr., while the dynamotor consumed 4 kw.-hr. The test covered actual working conditions over several days, the metal being weighed and the energy metered with a kilowatt-hour meter.

The application of thermit welding to track construction is now thoroughly established. Joints may be welded, special trackwork made on the property, broken pieces of special trackwork may be repaired and truck-frame and other heavy welding repairs may be done in the shops. To the company possessing a pneumatic tie-tamping machine or other adequate portable air-compressor unit the cost of acquiring additional equipment for a thermit welding plant is small. The illustrations reproduced herewith show the set-up for the repair of



COMPRESSED AIR EQUIPMENT FOR REMOVING CONCRETE IN TRACKS

a broken iron-bound, guarantee mate, the break occurring through the rail about 1 in. from the cast-iron frame. The mate was removed from the track and the compressor for furnishing air to the burner used for drying the mold was mounted in a farm wagon and placed alongside of the track. The weld was successful at a cost of less than one-third of the cost of a new piece, and owing to the fact that the weld was in the nature of an experiment the cost was unduly high.

OXYACETYLENE USED FOR CUTTING AND BONDING

It would not be fair to leave the subject of welding without some reference to the use of oxyacetylene as a cutting and welding agent. Owing to the availability of electric current, its use in track welding has been limited in favor of arc welding. In the shops and for bonding it has a wide application. It is superior to the electric arc for cutting and can be used profitably in trackwork for this purpose. A competent operator can cut out broken joints in connection with track repairs that are of a more or less temporary character in a fraction of the time that the work would take if the hacksaw were used. The cuts can be made so that a reasonably close joint is obtained. In addition to this, holes may be burned in the web of the rail for the bolts, the whole operation requiring not over a quarter of an hour. When special work has to be replaced at night when the cars are out of service, or when the time to perform this work is limited, the cutting tool is very useful in cutting bolts and in making cuts for temporary connections.

The electric welder and the rail-grinding machine are inseparable for many track repairs. The reciprocating grinder is a valuable tool for reducing corrugation, but is high in first cost for the small property. The various types of wheel grinders that are derailed easily are operated at a small expense together with the electric welder in the repairs to special work and cupped joints.

Among the least costly and yet most useful tools that should form a part of every electric railway's track equipment is the portable blacksmith outfit. Track departments are frequently forced to depend on the shops for work of this nature. Too often the master mechanic finds more work for his blacksmith in his own department than can be turned out, with the result that the work of other departments must wait, or not be done at all. A portable forge and anvil, with a dozen inexpensive tools that can be moved from place to place as the occasion demands, can maintain the track tools in good condition, make repairs to open track special-work layouts and, most important of all, make the joint plates used on repair work really fit. When the failures of joints in paved streets that are caused by the neglect to make the joint as nearly as possible mechanically sound are taken into consideration the blacksmith outfit rises in importance.

CONVENIENT WORK CAR IS VALUABLE

Almost every electric railway has some sort of a work car. It may be a big steel-underframe crane car, capable of hauling several trailers or steam road equipment, or it may be a plain single-truck platform car, that is just "car." The single-truck work car, with sides that may be raised or lowered and having a capacity of about ten cubic yards, is a valuable tool to any roadway department. It cannot, of course, carry 60-ft. rails, but if properly motored can haul a fair load on a rail truck. Owing to their ability to get through traffic expeditiously, these cars usually have the approval of the transportation department. In handling small amounts of material, tools and supplies they are superior to the double-truck cars and can be operated at much less cost. Now that the single-truck open car has nearly become a thing of the past, the conversion of a few of these into work cars would prove of real assistance to many track departments. One of these changes just referred to was made last year by a small Eastern property at a total cost of $126. This included the cost of removing the old body and adding a new floor and drop sides. The trolley stand is carried by a post in the center of the car and braced with insulated steel rods which run to each end and are located so as not to interfere with material carried.

Pneumatic tie-tamping outfits have not only increased the output of work per man in this particular but have improved the quality of work done. Their best work is accomplished when rock or slag ballast is used, although they may be used successfully with gravel or cinder ballast under careful supervision. The utility of these machines is not confined to tamping ties. With a pointed tool, brick or granite block pavement with grouted joints may be quickly removed, and the blocks or bricks cleaned. The concrete track foundation also may be rapidly broken up, using a small part of the force of men otherwise necessary. An illustration shows an experimental outfit built several years ago. A compressor that was being displaced in the shops was mounted on a car and a small air tool purchased. The tool was not of sufficient size, but the work performed

LARGE CONCRETE MIXER OPERATING ON TRACK BEING CONCRETED was more than equal to that of four men engaged in the same work of removing concrete paving foundation. In connection with the use of thermit welding, or where compressed air is used in any manner, this machine becomes a valuable adjunct.

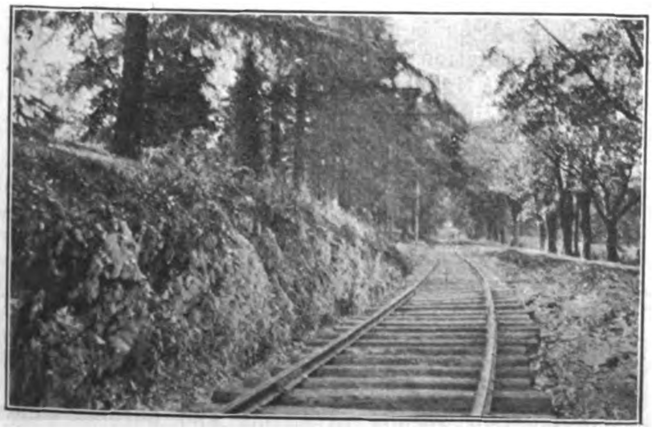
SMALL CONCRETE MIXER HAS ITS PLACE

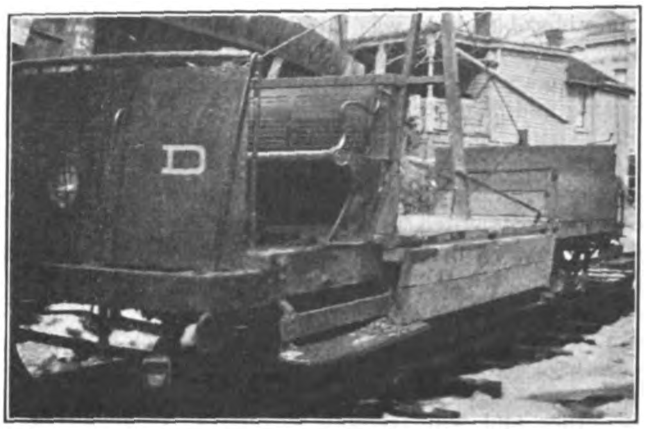
The small concrete mixer with a capacity of a quarter yard or less has a distinct place with all companies having a considerable mileage in paved streets. It should be equipped with a loading skip and preferably should be gas driven. The electric drive restricts the use of the machine to areas served by the electric circuits furnishing the proper voltage for the motor. The machine is scarcely large enough to use on extensive new paving work, but will rapidly pay for itself on paving repairs and in the construction of the numerous small concrete jobs that originate in the power house or shops. When used to replace concrete removed for the repair of joints the machine and the concreting material can be placed on a work car and the work can be performed under moderate traffic, thus avoiding the placing of the materials in the street at all until finally dumped in the excavation.

The electric drilling machine, as applied to the drilling of joints and tie-rod holes, was one of the first labor-saving tools to be adopted on electric lines. When properly used this tool is a real labor and time saver. If properly inspected by a competent mechanic and fused so that in the event of electrical trouble the motor will be protected from damage the electric drill will operate at a minimum of expense.

For a company operating considerable city street or suburban mileage the use of the light automobile truck offers an attractive proposition. First, it may serve as a vehicle for the roadmaster or general foreman, thus enabling him to be rapidly transported from place to place, and to cover his territory more times than would be possible if he depended on trolley cars for transportation; second, it enables the driver of the truck to rapidly move tools or small amounts of material from one job to another, thus relieving the work car of this duty. At the present time when the cost of operation per car-mile has reached so high a level every car-mile saved in a day's operation of work cars means dollars and cents.

In conclusion, the fact should not be lost sight of that no power tool can continue to operate long without proper inspection and maintenance. As a rule this should be the work of skilled mechanics. The tendency of the average trackman is to use a tool until it breaks down. An inspection at intervals of all power-driven equipment will often take a machine out of service for minor repairs which if allowed to lapse would put the machine out of commission for a much longer period of time.


POINTED TOOLS WITH PNEUMATIC TIE TAMPERS WERE USED TO CLEAR THIS ROADWAY


RECONSTRUCTED SINGLE-TRUCK OPEN CAR USED FOR TRACKWORK

Leather Mats Solve Cold Floor Problem

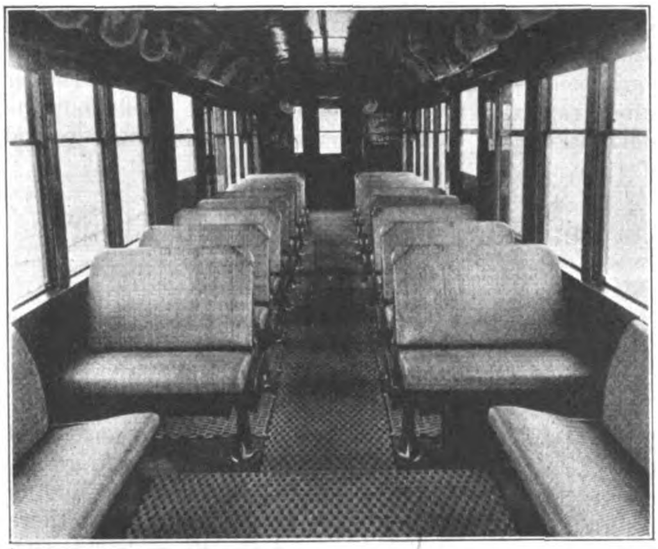
The Chicago Elevated Railways Are Installing These Leather Coverings to Overcome Passenger Objections to Composition Floors—Other Advantages Which Accrue from Their Use

IN ORDER to make the last all-steel cars purchased by the Chicago Elevated Railways entirely fireproof, composition floors were specified. It developed during the first winter these cars were in service that there were numerous complaints about the floors being cold. Investigation was made to determine whether the floors really were colder than in the older type cars, for the composition floors had been well insulated. While the thermometer tests showed that the floor was actually no colder than the wooden floors in other cars, and that the difference in temperature between the air at floor level and at head level was no greater, it was nevertheless determined that apparently because of the greater conductivity of the composition floor it really did feel colder to passengers. Another explanation given was that on the composition flooring a passenger's shoes are in full contact with a perfectly flat surface, while with a car with wooden floor and floor strips, only a comparatively small part of his shoes is in actual contact with the floor, the air spaces between floor strips forming an excellent insulating material.

It was also found out in the investigation that the composition floor is slightly porous and consequently on wet days it absorbs some moisture and perhaps feels colder on this account. An effort was then made to overcome this porosity by applying a waterproofing compound to the floor after it had previously been thoroughly dried out for twenty-four to forty-eight hours by turning on all of the heaters with the car closed and standing inside the shop. After this waterproofing had dried, the surface of the floor was painted with a colored cement paint. This process of treating the floor was followed annually for some three years, and while it did improve the situation, it did not do away with the complaints of cold floors.

Considerable study was then given to the problem of using some kind of floor matting or wooden strips. Rubber matting, cocoa matting, steel matting, leather matting and floor strips installed on top of the composition flooring and various other remedies were all tried. It was obvious almost from the first, according to H. A. Johnson, organization engineer, that the leather matting was the best suited to the purpose, but the objection to this was its high cost. However, after trying out all of the other suggested schemes and mattings, ten cars were equipped with the leather mats last year and this year additional cars are being equipped.

On cars equipped with longitudinal seats, the matting is used in a wide strip, extending from one bulkhead to the other and wide enough so that it reaches a few inches underneath the edge of the seat cushions so that a passenger's heels rest on it. In cars equipped with cross-seats, the mat is arranged to cover the aisle space between the seat pedestals, and additional pieces of matting, hinged to this main aisle strip, extend in between each seat. An arrangement of the matting for the longitudinal seats at the ends of these cars is made similar to that described for the all-longitudinal seat cars. In cars of both types of seating arrangement, the matting is laid down in three to five sections per car so that it may readily be rolled up and handled by one man. With the matting for the cross-seat cars, the pieces extending between the seats are simply folded over the aisle piece and rolled up with it to remove from the car. In order to prevent passengers from stumbling over the ends of the mat, which is about ⅝ in. thick, a wood strip beveled off was fastened to the floor at each bulkhead and the first section of the matting laid on the floor against this strip. No fastening whatever for the floor mat is required, as its flexible chain-link construction and weight makes it lie perfectly flat with apparently no tendency to get out of place.



LEATHER FLOOR MAT AS USED IN CARS OF CHICAGO ELEVATED RAILWAYS

Mr. Johnson says the leather floor mat has very satisfactorily solved the problem. Not only is the leather a very good insulator of both heat and electricity, but it has the air space openings which improve the heat insulating properties and it has a very high anti-slip property. The advantages of the matting are particularly noticeable on wet, snowy days, for it provides a place for the water, snow and dirt to fall where it is not tramped in by passengers. Without the matting on such wet days, water accumulates into puddles on the composition flooring, sometimes clear into the center of the car, through which passengers must walk. The wearing qualities of the leather mat, inasmuch as it is made of leather punchings placed on edge, is thought to compare favorably from the experience thus far with that of the wood strips on the ordinary wooden car floor. Incidentally, the Elevated companies recently replaced some wood floor strips which had been in service for more than twenty years without renewal. If the indicated wearing quality of the leather mat is proved the first cost may appear in a different light. The presence of the leather mat in a car adds slightly to the cost of car cleaning, though the fact that it is readily removed for cleaning purposes minimizes this extra cost. With the floor mat removed, the smooth, sanitary advantages of the composition floor are retained and the mat itself is easily cleaned after it is taken out of the car by turning the hose on it. The mats are used only during the winter months, and are stored for the eight warmer months so that this additional cleaning trouble and expense is encountered only four months of the year.

The use of this type of floor mat is also being considered for use on the interurban cars of the Chicago, North Shore & Milwaukee Railroad as a substitute for the corrugated rubber floor mat used on the newer type cars and the alternate steel link and composition link mats used on some of the older type cars.

A Loose Band Makes Bad Music

A LARGE railway company had been successfully operating a number of large motors for several years with practically no failures of any kind. The company was congratulating itself upon this lack of trouble, when one of the armatures failed, and upon investigation the failure was found to be due to armature band trouble.

Indications were that the core bands on the armature in question had worked loose, thus allowing movement of the windings and finally causing the failure. The first thought was that probably the material in the bands was of an inferior grade and had stretched, but tests indicated that this was not the case. In an attempt to obtain information as to the probable cause of this failure another machine was opened up and the bands inspected. It was noted that the core bands were slightly loose, several of them being cut off, and it was then found that the insulation under these bands had become dry and brittle.

With this information at hand the following theory was advanced as being responsible for the trouble. When the insulation is placed under the band it is soft and the band is tight. After the motor has been in service for some time, however, the working temperatures of the motor cause this material to dry out and shrink, allowing the bands to become loose. It was then decided to replace the strip of insulation material under the core bands with a strip of tin, and this change, after a number of years of service, was found to give very satisfactory results.

As a result of this experience all armatures, during the overhauling of these motors, have been rebanded, replacing the insulation under the core bands with a strip of tin to which the band wires are securely soldered. This results in strong and durable bands which have not given any further trouble by working loose in service.

Utilizing Figures to Keep Down Costs

Mechanical Department of New York State Railways Rearranges Data from Auditor and Storekeepers in Special Forms Suitable for Stimulating Spirit of Economy in Shops and Carhouses—Organization in Divisions Utilized to Develop Competition Among Several Parts of Property

AN ILLUSTRATION of the ways in which the periodical reports prepared by the accounting division of an electric railway organization can be utilized to advantage in promoting economy is furnished by the equipment department of the New York State Railways. This company operates city lines, principally in Rochester, Syracuse and Utica, and interurban lines in the same territory. The administrative headquarters of the system are at Rochester, where the president, James F. Hamilton, is located, but for operating purposes there are two main sections, respectively the Rochester lines, under Mr. Hamilton's managership, and the Syracuse-Utica-Oneida lines, of which B. E. Tilton is general manager. J. F. Uffert, located at Rochester, is superintendent of equipment for the entire system, and H. S. Sweet, with headquarters at Syracuse, is engineer of equipment. H. C. Kaercher is master mechanic Rochester lines; J. F. McInerney, master mechanic Syracuse and Oneida lines, and F. T. McCann, master mechanic Utica lines.

WHAT IS DONE WITH THE RECORDS

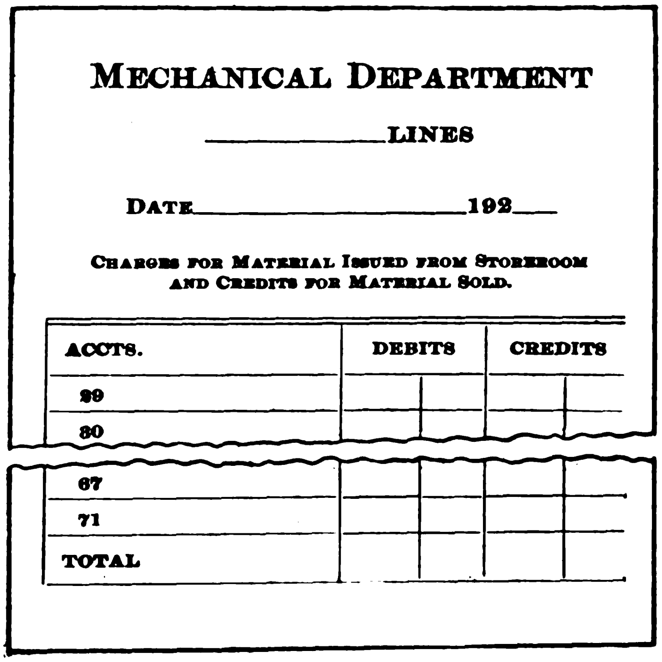
As on all electric railways, the auditing department furnishes monthly to the equipment department the records of operating expenditures on the property classified according to the standard system of accounts. From these, the items of interest to the master mechanics are totalized by divisions and sent to the master mechanics in the various cities for comparative study, together with comment, if such seems necessary, from the superintendent of equipment. A similar procedure is followed with the accounts of jobs involving capital expenditure, showing the amounts expended during the month and the unexpended balances.

Next, in order to permit the master mechanics to gage their progress, a combination sheet is prepared showing for each division the cost of maintaining equipment, that of car operation and the total operating expense, with percentages of increase or decrease for the same month over a period of four years. This not only permits cost tendencies to be determined but also shows which shops are making the best records and stimulates emulation.

To make the data still more interesting they are worked over to show the costs in cents per car-mile and per car-hour for the current and preceding two years. The sheet containing this information also shows the percentage of the company's gross revenue and the percentage of the total operating expenditures which are used by the equipment department.

All of the above figures are given in tabular form. They could be easily graphed if desired, but Mr. Uffert finds the tabular form simpler and more effective for his purpose.

Coming now to the material items, which more directly affect expenses, possibly the most important record is the monthly report on consumption of brakeshoes, lubricants, trolley wheels, lamps, carbon brushes, etc. These show the items, both quantities and costs, for each carhouse on the entire system. Costs are calculated with arbitrary unit prices so as to permit comparison on an equivalent basis, otherwise they would not furnish a measure of maintenance efficiency. The costs can readily be translated into current values, if desired, for comparison with data secured from outside the property. These figures are also totalized for each division and are put into the unit forms of car-miles operated for each item and cost per thousand car-miles.



MECHANICAL DEPARTMENT

______LINES

DATE______192__

CHARGES FOR MATERIAL ISSUED FROM STOREROOM AND CREDITS FOR MATERIAL SOLD.

ACCTS.	DEBITS		CREDITS	
29				
30				
67				
71				
TOTAL				

STOREKEEPER'S FORM FOR REPORTING MATERIALS CHARGES DAY BY DAY TO MECHANICAL DEPARTMENT

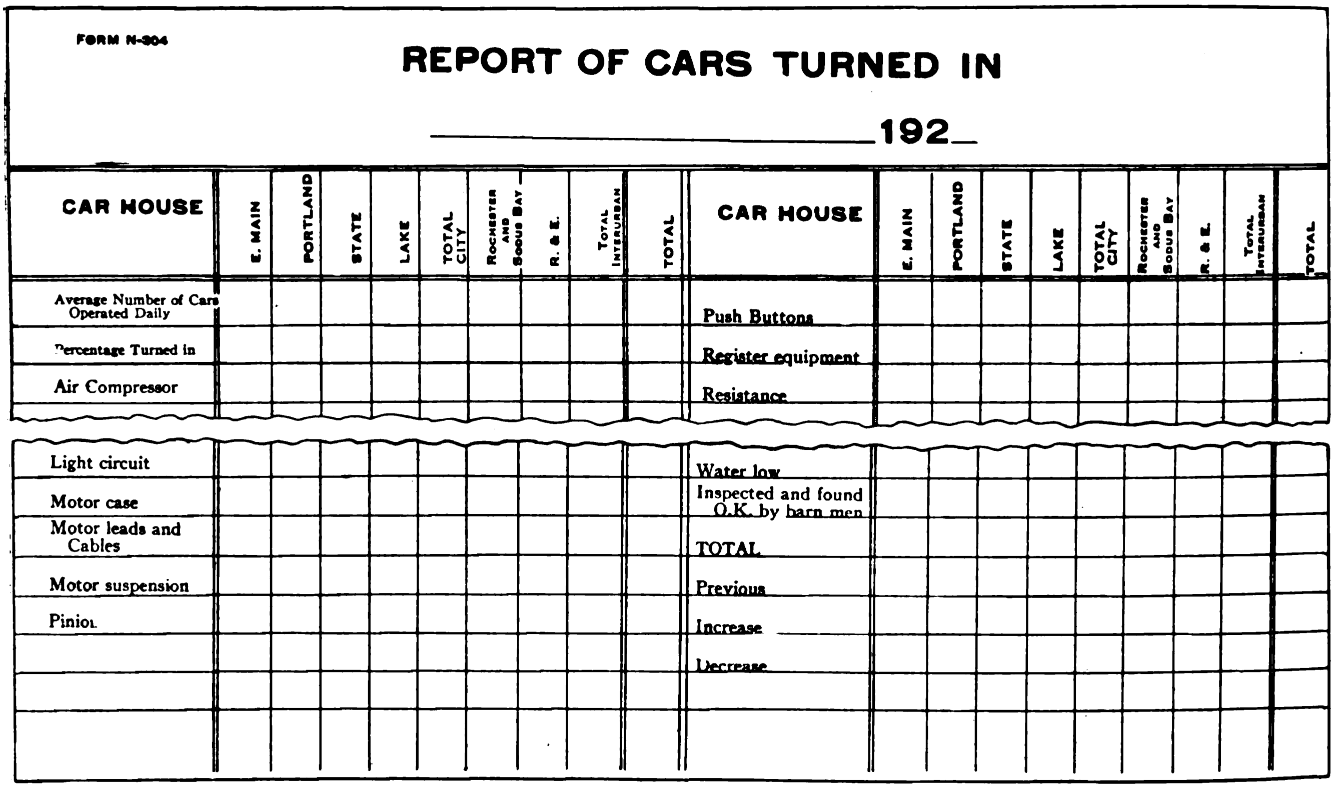
CARHOUSES RATED BY BRAKESHOE WEAR

To induce rivalry among the carhouses, the item of brakeshoes has been selected as a basis of carhouse rating, brakeshoe wear lending itself better than any other item for this purpose. To furnish the information for this rating, and, of course, primarily to reduce brakeshoe consumption, all scrap brakeshoes are inspected to determine the scrap worth and the causes for scrapping. The latter are classified as: (1) Worn out; (2) tapering; (3) overlapping, and (4) wedged. The percentages of total wear secured are calculated and tabulated, with data from the last report included for comparison, and the carhouses are listed in order of merit. The operation of this plan has secured some remarkable percentages of wear, and the tables show clearly how much can be saved by careful watching of shoes, turning them at the proper times, etc.

The local master mechanics post these records to stimulate the carhouse inspectors to make their best efforts. The posters show not only the ratings by carhouses but also by lines.

It is not practicable to furnish the master mechanics with relative ratings on other items, but as much detail as possible is given them to enable them to determine where the "leaks" are. For example, in lubricants there are three kinds classified, that is, car oil, compressor oil, and gear lubricant. Data are also supplied on wheels, field coils, gears and pinions. All of these records cover not only the preceding months but also the year to and including the current month.

In order to permit a comparison of labor items, weekly reports are furnished by the master mechanics of the present numbers of employees on their rolls. The central equipment office compiles these with the corresponding numbers for two preceding years. Weekly payroll reports are also prepared showing increases or decreases over the preceding year. As a check against these tabulations the accounting department furnishes weekly reports of payrolls and names on the lists, showing increases and decreases with respect to preceding reports both for divisions and the whole system. The mechanical department office then prepares for the master mechanics weekly payroll reports showing the numbers of men on the department payrolls of all divisions, the amounts of these payrolls, the total company payroll, the increase or decrease of the equipment department labor items for each division and the whole, the same for the total company payroll, the percentages of increase or decrease for the equipment and other departments and for all departments and the percentage that the equipment department payroll is of the whole.



FORM N-304

REPORT OF CARS TURNED IN

________________192_

CAR HOUSE	E. MAIN	PORTLAND	STATE	LAKE	TOTAL CITY	ROCHESTER AND SODUS BAY	R. & E.	TOTAL INTERURBAN	TOTAL	CAR HOUSE	E. MAIN	PORTLAND	STATE	LAKE	TOTAL CITY	ROCHESTER AND SODUS BAY	R. & E.	TOTAL INTERURBAN	TOTAL
Average Number of Cars Operated Daily										Push Buttons									
Percentage Turned In										Register equipment									
Air Compressor										Resistance									
Light circuit										Water low									
Motor case										Inspected and found O.K. by barn men									
Motor leads and Cables										TOTAL									
Motor suspension										Previous									
Pinion										Increase									
										Decrease									

FORM USED FOR COMPILING DATA REGARDING PULL-IN CAR DEFECTS

CO-OPERATION WITH THE STOREKEEPER

Every day the storekeeper for each division sends to the equipment office a statement, by account numbers, of charges for materials issued from the storerooms. This information is sent on a 3½ in. x 6 in. ticket like that reproduced. It contains also credits for material sold. These data are totalized daily in the office from the beginning of the month to date, permitting an almost instantaneous approximate statement to be made of the expenditures and also the necessary corrective measures to be taken to prevent totals from getting beyond control.

When special campaigns for keeping down expenses are under way, comparative monthly figures are compiled and cumulative totals are furnished to the master mechanics from day to day.

THE REPEAT BOARD AND ITS FUNCTIONS

A conspicuous chart in the office of each master mechanic is what is known as the "repeat board." This is a chart with a horizontal space for each car and a column for each day of the month. Every time a car is "pulled in" or "changed off" or is crippled on the line an entry is made and the nature of the defect is indicated by an appropriate symbol.

Reports of cars turned in are compiled each week and copies are sent to the several carhouse foremen. In these defects are separated into mechanical, electrical and man-failure, and comparisons are made with the preceding year. Consolidated reports by carhouses and divisions are also made up with data put into the form of percentages and arranged in order of merit. The master mechanics meet monthly to consider these reports and other matters of interest. The meetings are held in different places, but generally in Syracuse, which is centrally located.

The various reports described above look rather formidable as listed. They are, however, very simple and require but part of the time of two clerks in the central office and the usual clerks at the several shop centers.

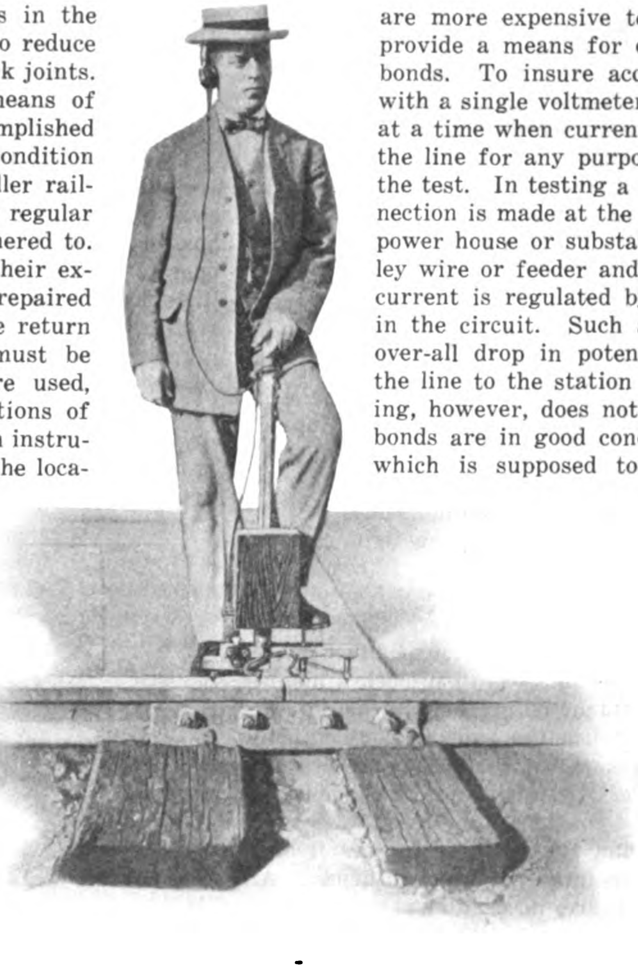
Few printed forms are required; the two which are reproduced are typical.

Portable Bond Testers

The Primary Object of Testing Bonds Is to Locate Those in Poor Condition, so that Proper Repairs Can Be Made—Portable Instruments Afford the Most Effective Means for This Class of Testing—Convenient Tables for Use of Men Making Tests Minimize Calculation and Assist in Locating Bad Bonding

BY G. H. MCKELWAY
Engineer of Distribution Brooklyn (N. Y.) Rapid Transit Company

THE object of installing bonds in the tracks of electric railways is to reduce the voltage drop across the track joints. Electrical instruments provide a means of seeing how well this has been accomplished and for accurately determining the condition of the bonds. On many of the smaller railways the practice of making tests or regular inspections of bonding is seldom adhered to. When once the bonds are installed, their existence is forgotten until the track is repaired or relaid, unless the condition of the return circuit becomes so bad attention must be given it. Where exposed bonds are used, some railways make periodic inspections of the bonds instead of making tests with instruments. Such inspections determine the locations at which bonds have been stolen, the terminals have loosened or the strands have become broken to such an extent as to justify rebonding. Even where concealed bonds are used, a few companies rely upon inspection rather than testing for determining their conditions. In the making of such an inspection a method sometimes used is to note the temperature of the joints. The common practice is to make such an inspection just after or during a light fall of snow. The heating at joints will melt the snow away, so that poor bonding can be readily located. Such an inspection can only be made during the winter. However, some railways have tried this method at other times by requiring an inspector to feel each joint and thus judge of its temperature. Such a method is almost valueless, however, as the results obtained are very unsatisfactory as compared with those obtained from the use of proper instruments.



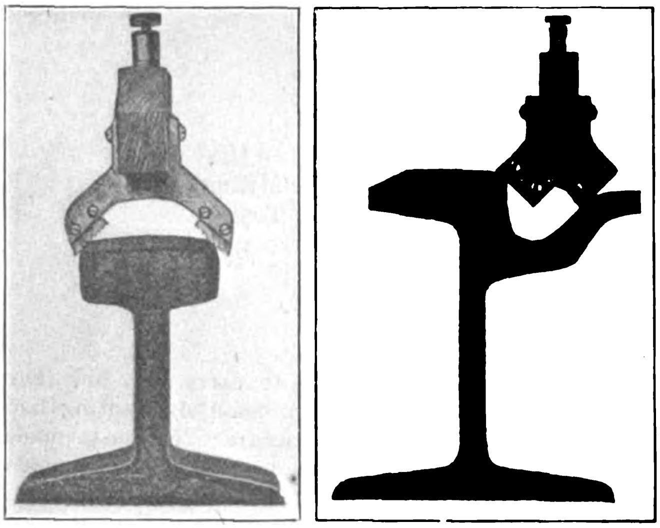
BOND TESTER WITH FOUR CONTACT POINTS

MAKING TESTS WITH A VOLTMETER

One of the simplest methods of testing bonds with an instrument is to use a voltmeter and determine the drop of potential, either for the line as a whole or across individual joints. The first method shows how much power is being lost in the lines, but does not indicate whether this loss is the result of many joints in an average condition or a very few joints with bonds in bad condition, nor does this method give any information which will aid in locating badly bonded joints.

Tests on the individual joints take more time and are more expensive to carry out, but they provide a means for definitely locating bad bonds. To insure accuracy for tests made with a single voltmeter, they should be made at a time when current is not being used on the line for any purpose other than that of the test. In testing a line as a whole, a connection is made at the end farthest from the power house or substation between the trolley wire or feeder and the track rails. The current is regulated by inserting resistance in the circuit. Such a test gives the total over-all drop in potential from the end of the line to the station busbar. A low reading, however, does not prove that the track bonds are in good condition, as the current which is supposed to return through the rails may return to the station by following water and gas pipes, lead-covered cables or the rails of intersecting or adjacent lines. When the test is made on each individual joint, it is not necessary to shut down the line. A difficulty sometimes experienced is caused by a fluctuation of the current. Readings taken under these conditions give but an approximation of the drop and should not be used for comparison, but will be sufficiently accurate to determine the location of very badly bonded joints. By the use of two voltmeters, one connected across the joint and the other connected between two contacts on the uncut rail a few feet apart, the drop of potential across the joint can be compared with that of the known length of unbroken rail. By reading both meters at the same time the tester gains accurate data.

This is a deservedly popular method, and to lessen the difficulty of reading the two meters simultaneously and to save space and weight, the two meters are sometimes combined and placed within a single case. Many prefer, however, to have the tests made by two men, each one reading one meter. With the two-voltmeter test the calculation necessary for determining the length of unbroken rail which would have the equivalent resistance to that of the joints is usually done later at the office and not in the field.



INVERTED AND UPSTANDING "V" CONTACTS

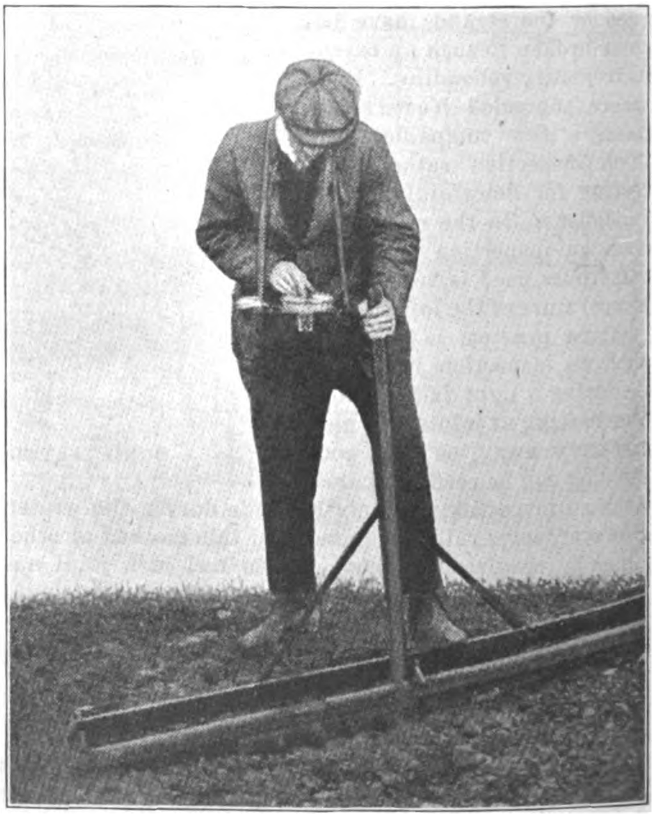
A means of avoiding calculation is to furnish the testers with a table showing the maximum reading of the meters placed across the joints for any readings taken on the uncut rail, if the joint is to be considered a good one. If the reading obtained is higher than this maximum, the joint is either marked or located in the notes so that it can be readily found again for repairs or rebonding; if the proportion between the readings is less than the maximum, no record need be kept unless it is desired to have such a record of all the joints for comparison with readings taken at other times.

An accompanying illustration shows a light compact outfit that can be handled by one man. It consists of a telephone receiver with a headpiece, a box containing primary batteries for supplying the current for making the tests and a jointed test bar with four contact points. This contact bar is placed on the rail in such a manner that the two inside contact points bridge the joint to be tested, but do not touch the rail, all contact being made by the two end points. A sound is received in the telephone receiver unless the resistance of the joints is so high that it may be considered as "open." By putting his foot on the bar, the operator presses it down so that the two center points touch the rail firmly. Another sound is then heard in the telephone receiver. With the usual calibration the two tones will be of equal intensity, when the resistance of the joint is approximately equal to the resistance of 6 ft. of unbroken 70-lb. rail. This calibration, however, can be altered so that the point of equal sound intensity will occur at some other measure of resistance if desired. When the second tone is louder than the first the resistance of the first is higher than what is considered good practice, and the joint should be rebonded. On the other hand, if the second sound is equal to or less than the first in loudness, the joint is usually considered as being in good condition. This instrument does not measure accurately the resistance of the joint, but it gives an indication of those joints which are good and those which are poor. With this instrument joints can be tested very rapidly, especially on quiet lines where there are no outside noises to interfere with the sound produced in the telephone receiver. Another advantage of this instrument is that the sounds are made by the current in the battery carried in the box with the instrument and are, therefore, not dependent upon the current in the rail. The instrument can thus be used at any time, regardless of whether the line is alive or dead.

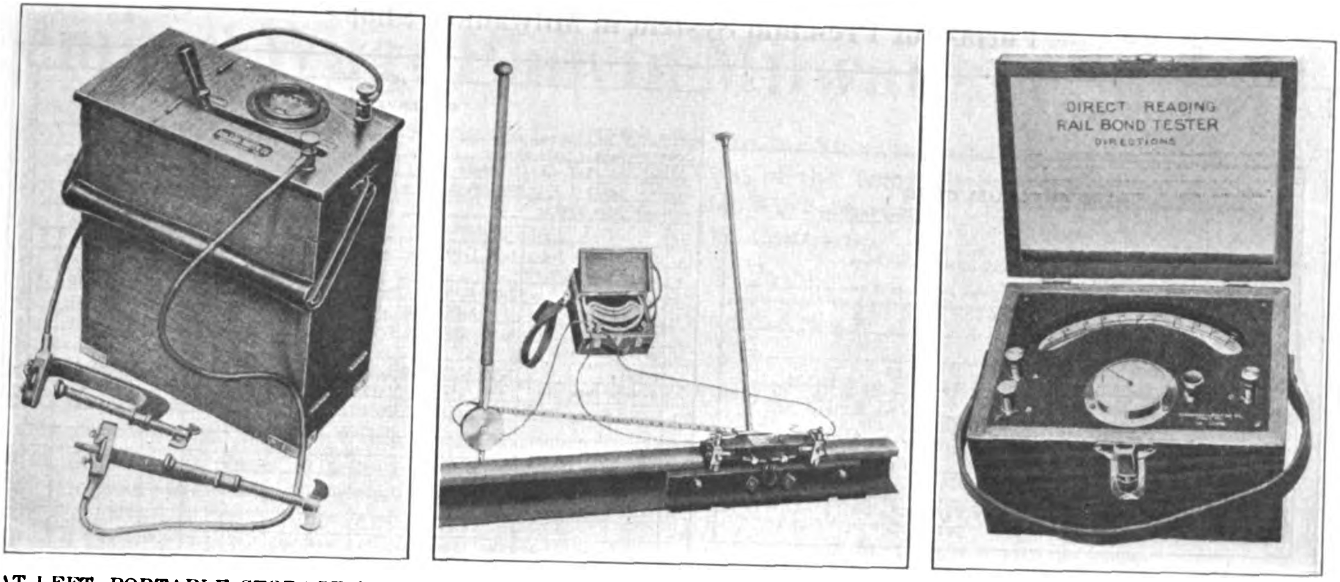
Another type of single instrument used for bond testing is constructed on the principle of the Wheatstone bridge. With this, the current used for operating the instrument is that flowing in the track rails, and the contact bar consists of a single bar with three contacts made from pieces of hacksaw blades. This type of contact is more satisfactory than that of a single point or chisel, which is sometimes employed, as the surface skin of the rail head is a rather poor conductor and requires sharp points to pierce it and make sure of good contact. Three types of contact are employed where hacksaw blades are used. One type has the blade arranged to form an upstanding V. This is used in the grooves of girder rails. One type has an inverted V for use on the heads of T-rails and the third is a flat type for use on either girder or T-rails.

HOW THE TEST IS MADE

This type of instrument is arranged to be hung around the neck of the operator by a strap, while the cover drops down between the operator's body and the box to assist in steadying it. To make the test, the operator places his foot on the contact bar, gives it a little motion to insure good contact, and adjusts the resistance in the two arms of the bridge by turning a knob in the center of the face of the instrument. The two other arms of the bridge are formed by the unbroken rail and the bridge across the joints to be measured. The turning of the knob not only adjusts the resistance of the two arms, but also moves a pointer around the scale of the instrument. When a balance is obtained so that the galvanometer needle is at zero, the pointer shows the number of feet of unbroken rail, whose resistance is equal to the resistance across the joint. When the current in the rail is small, it is often difficult to determine when an accurate balance is obtained. For use under such conditions, a push-button



PORTABLE BOND TESTER IN USE



AT LEFT, PORTABLE STORAGE BATTERY EQUIPMENT FOR USE WITH BOND TESTER; CENTER, INSTRUMENT WITH SELF-WINDING TAPE AND MILLIVOLTMETER; AT RIGHT, DIRECT READING RAIL BOND TESTER

switch is provided on the case, which can be opened and closed. The static kick thus produced will cause the needle to move if the arms are not well balanced. One company which makes use of this type of instrument has a portable resistance such as is used with arc welders connected between the trolley wire and the rail farther away from the trolley station than the joint tested. The use of this resistance insures sufficient current for obtaining a reliable balance. As this type of bond tester is actuated by the current in the rail, it cannot be used when the line is dead, unless current for testing is supplied from some auxiliary source. A storage battery is sometimes used. This is either mounted on a small hand car or else carried in a box by an assistant. The manufacturers of this type of bond tester supply a storage battery of 187½-amp.-hr. capacity inclosed in a wooden box, on which are mounted a switch, an ammeter and a rheostat, together with terminals for attaching the necessary leads. This case is 12 in. by 7 in. by 15 in., and the complete outfit weighs 45 lb.

When the battery is used to supply current, the box containing the battery is placed on the ground near the joint to be tested. A connection is made to the rail by means of C clamps, two of these being placed on the rail at opposite sides of the joint and far enough apart to permit the putting of the contact bar between them when in position for testing.

Another type of bond tester which makes use of a contact bar has three contacts, like the one just described. Two of these contacts, however, are made from files and the third is made by a rod, which is pressed down on the rail by the hand of the man operating the instrument. This type of instrument does not require the adjustment of resistance and the resistance of the joints in terms of the equivalent number of feet of unbroken rail is read directly from the scale of the instrument.

DIFFERENTIAL MILLIVOLTMETER ALSO USED

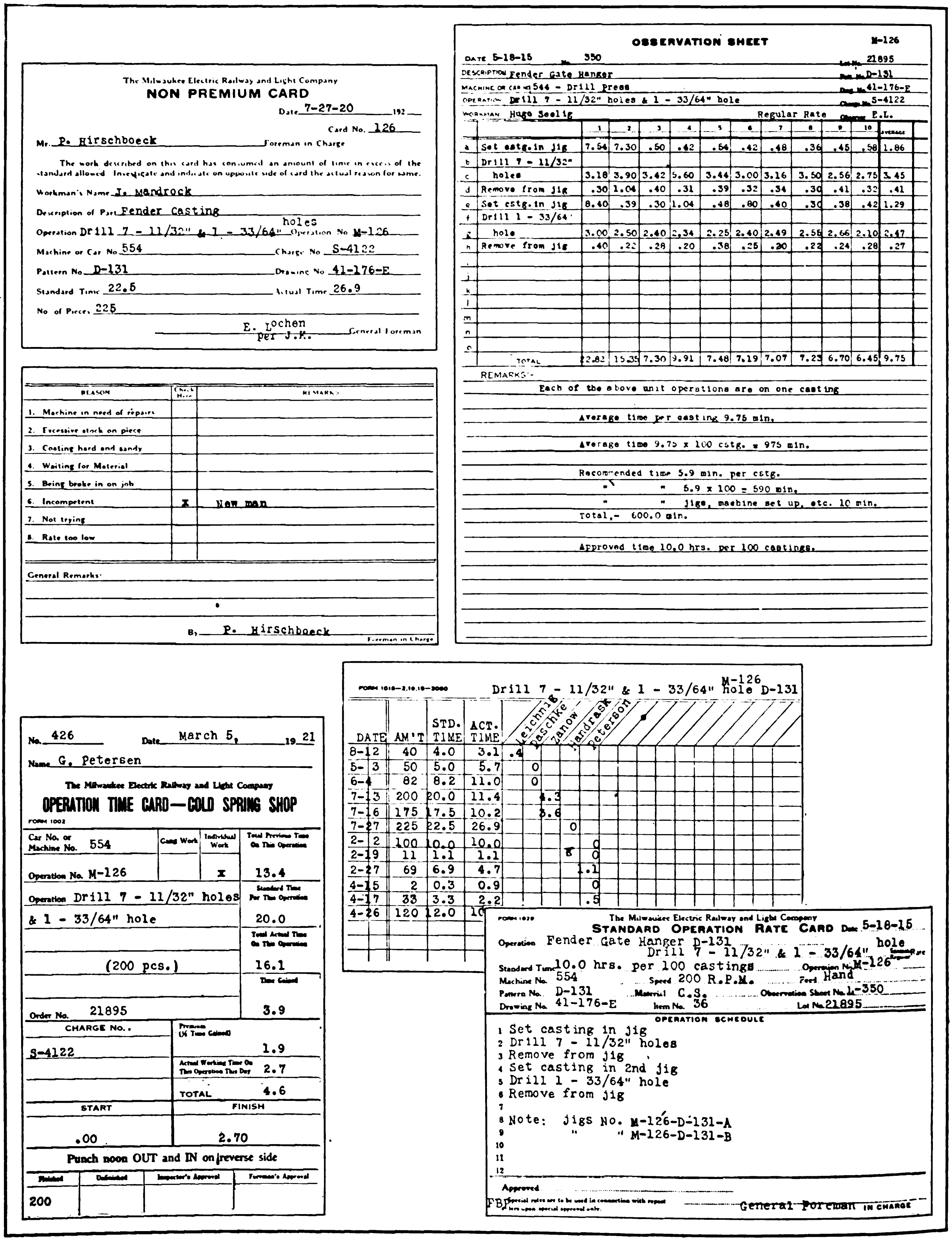
Another type of bond testing instrument consists of a differential millivoltmeter in which the opposing forces are supplied by the current in the rail, which causes one voltage drop across the joint, and another between variable points on the uncut rail. A fixed contact bar is used, consisting of two points 12 in. apart, which are clamped to the head of the rail, one of the points thus being on each side of the rail joint. Leads run from these two points to the terminals of the voltmeter, and in the tests the drop between the two points is balanced by varying the resistance on the other side of the circuit. This is not done by means of the resistance contained within the instrument case, but by moving a third contact along the uncut rail. This contact consists of a chisel point on the end of a wooden rod. Between the chisel point and the fixed contact of unbroken rail is a steel tape which shows the exact distance between the contacts. Therefore, while this instrument reads directly the resistance of the rail joint in terms of the equivalent length of unbroken rail, this length is read from a tape and not from the scale of the instrument.

Fine Record for Car Wearing Parts

THE Madison (Wis.) Railway has been particularly pleased with the service obtained from the fine new cars which were placed in service in December, 1916. These semi-steel cars, Nos. 65, 66, 67, 68 and 69, ran varying distances, from 165,000 to 200,000 miles, between December, 1916, and December, 1920, without ever coming into the shop except for ordinary inspection. During this four-year period the gears and pinions, motor and axle bearings, and armatures were not touched, except for the nightly inspection and brush renewals. In December, 1920, the armatures were taken out, turned and reslotted and put back in service, in some instances with new pinions, and in other cases there was enough remaining life so that it paid to put the old pinion back in service. At this time most of the armature and axle bearings were renewed.

The cars were originally equipped with 34-in. steel wheels which ran until June, 1920, the mileage records showing from 140,000 to 150,000 miles. Wheels are inspected once in two weeks on this property, and if one wheel appears to be wearing more than its mate, a wheel-truing brakeshoe is put on the other wheel and it is ground down until of the proper diameter. These cars are equipped with Brill 21-E trucks with hand brakes and GE-247-D ventilated interpole motors. The cars weigh 23,600 lb. and are of the single-truck, rear-entrance and front-exit type.

Forms for Premium System in Milwaukee Shops



The Milwaukee Electric Railway and Light Company

NON PREMIUM CARD

Date 7-27-20 192

Card No. 126

Mr. P. Hirschboeck Foreman in Charge

The work described on this card has consumed an amount of time in excess of the standard allowed. Investigate and indicate on opposite side of card the actual reason for same.

Workman's Name J. Mandrock

Description of Part Fender Casting

Operation Drill 7 - 11/32" & 1 - 33/64" holes Operation No M-126

Machine or Car No 554 Charge No S-4122

Pattern No D-131 Drawing No 41-176-E

Standard Time 22.5 Actual Time 26.9

No of Pieces 225

E. Lochen per J.K. General Foreman

REASON	Check Here	REMARKS
1. Machine in need of repairs		
2. Excessive stock on piece		
3. Coating hard and sandy		
4. Waiting for Material		
5. Being broke in on job		
6. Incompetent	x	New man
7. Not trying		
8. Rate too low		

General Remarks:

By P. Hirschboeck Foreman in Charge

OBSERVATION SHEET M-126

DATE 5-18-15 No. 350 Lot No. 21895

DESCRIPTION Fender Gate Hanger Part No. D-131

MACHINE OR CAR NO. 544 - Drill Press Dwg. No. 41-176-E

OPERATION Drill 7 - 11/32" holes & 1 - 33/64" hole Charge No. S-4122

WORKMAN Hugo Seelig Regular Rate Observer E.L.

		1	2	3	4	5	6	7	8	9	10	AVERAGE
a	Set cstg. in jig	7.54	7.30	.50	.42	.54	.42	.48	.36	.45	.58	1.86
b	Drill 7 - 11/32"											
c	holes	3.18	3.90	3.42	5.60	3.44	3.00	3.16	3.50	2.56	2.75	3.45
d	Remove from jig	.30	1.04	.40	.31	.39	.32	.34	.30	.41	.32	.41
e	Set cstg. in jig	8.40	.39	.30	1.04	.48	.80	.40	.30	.38	.42	1.29
f	Drill 1 - 33/64"											
g	hole	3.00	2.50	2.40	2.34	2.25	2.40	2.49	2.58	2.66	2.10	2.47
h	Remove from jig	.40	.22	.28	.20	.38	.25	.20	.22	.24	.28	.27
i												
j												
k												
l												
m												
n												
o												
	TOTAL	22.82	15.35	7.30	9.91	7.48	7.19	7.07	7.23	6.70	6.45	9.75

REMARKS:-

Each of the above unit operations are on one casting

Average time per casting 9.75 min.

Average time 9.75 x 100 cstg. = 975 min.

Recommended time 5.9 min. per cstg.

" " 5.9 x 100 = 590 min.

" " jigs, machine set up, etc. 10 min.

Total,- 600.0 min.

Approved time 10.0 hrs. per 100 castings.

FORM 1018—2.10.10—3000

Drill 7 - 11/32" & 1 - 33/64" hole D-131 M-126

DATE	AM'T	STD. TIME	ACT. TIME	Leichnig	Paschke	Zanow	Mandrask	Peterson
8-12	40	4.0	3.1	.4				
5-3	50	5.0	5.7		0			
6-4	82	8.2	11.0		0			
7-13	200	20.0	11.4			4.3		
7-16	175	17.5	10.2			3.6		
7-27	225	22.5	26.9				0	
2-2	100	10.0	10.0					0
2-19	11	1.1	1.1					0
2-27	69	6.9	4.7					1.1
4-15	2	0.3	0.9					0
4-17	33	3.3	2.2					.5
4-26	120	12.0	10					

No. 426 Date March 5, 19 21

Name G. Petersen

The Milwaukee Electric Railway and Light Company

OPERATION TIME CARD—COLD SPRING SHOP

FORM 1002

Car No. or Machine No. 554

Gang Work

Individual Work x

Total Previous Time On This Operation 13.4

Operation No. M-126

Operation Drill 7 - 11/32" holes & 1 - 33/64" hole

(200 pcs.)

Standard Time Per This Operation 20.0

Total Actual Time On This Operation 16.1

Time Gained 3.9

Order No. 21895

CHARGE NO. S-4122

Premium (½ Time Gained) 1.9

Actual Working Time On This Operation This Day 2.7

TOTAL 4.6

START	FINISH
.00	2.70

Punch noon OUT and IN on reverse side

Finished	Unfinished	Inspector's Approval	Foreman's Approval
200			

FORM 1020

The Milwaukee Electric Railway and Light Company

STANDARD OPERATION RATE CARD Date 5-18-15

Operation Fender Gate Hanger D-131 Drill 7 - 11/32" & 1 - 33/64" hole Special Regular Rate

Standard Time 10.0 hrs. per 100 castings Operation No. M-126

Machine No. 554 Speed 200 R.P.M. Feed Hand

Pattern No. D-131 Material C.S. Observation Sheet No. L-350

Drawing No. 41-176-E Item No. 36 Lot No. 21895

OPERATION SCHEDULE

1 Set casting in jig
2 Drill 7 - 11/32" holes
3 Remove from jig
4 Set casting in 2nd jig
5 Drill 1 - 33/64" hole
6 Remove from jig
7
8 Note: Jigs No. M-126-D-131-A
9 " " M-126-D-131-B
10
11
12

Approved

FBP Special rates are to be used in connection with repeat lots upon special approval only.

~~General Foreman~~ IN CHARGE

Top left, front and back of the non-premium card used in checking up when time taken is longer than standard.

Bottom left, operation time card on which workmen record starting and finishing time on the one job.

Top right, observation sheet used in determining standard time and method, filled in for an actual case.

Center right, accumulative performance record for each job, showing comparison between different workmen and varying efficiency of the same man.

Bottom right, standard operation rate card from which workmen get instructions for doing job and standard time allowance.

Premium Wage Plan in Milwaukee Shops

Résumé of Six Years' Experience with Bonus Pay for Standardized Jobs—The System Is Now Applied to 50 per Cent of the Total Time Worked—It Means Better Pay to the Workmen and Lower Maintenance Costs to the Company

BY J. H. LUCAS
Superintendent of Rolling Stock the Milwaukee (Wis.) Electric Railway & Light Company

SUBSTANTIAL extra pay for industrious and efficient workmen, a saving to the company of some 25 per cent on the payroll, a more expeditious handling of work in the shops with consequent smaller organization and an invaluable accumulation of recorded information on detail car maintenance work are among the more important of many advantages accruing from the extensive use of a premium or bonus system of paying shop employees in Milwaukee. It has proved to be so eminently successful after six years of experience that neither company nor employees would consider a return to the old flat pay plan which was displaced. This premium system of wage payment was first initiated in the rolling stock department of the Milwaukee Electric Railway & Light Company in 1912, in connection with the washing of cars at carhouses, and it was tentatively experimented with on different classes of work during this and the following year. In 1914 it was definitely decided to extend the plan to the company's main repair shops. The plan was well started some time before the writer became associated with the organization and all credit for the pioneering work belongs to my predecessors and to many of the loyal workers of all ranks, who have supported the movement and who are now, if not at first, its most enthusiastic champions.

Beginning with a few men and some of the more simple and easily standardized pieces of work, the application of the premium system has been extended by steps from the paint shop to the armature room and to the forge shop, machine shop and carpenter, pattern and foundry departments, in order, and lastly to the motor and truck repair division. It has been tried out and found adaptable to practically all phases of the great variety of work handled by a street railway shop, including the running maintenance, repairs and renewals and new manufacture and construction. We have covered all classes of operations, from the painting of cars, the manufacture of car and small machine parts, the construction and installation of new equipment, changing wheels and motors, rewinding armatures and even to the repairing of wrecked cars. It will be noted from the accompanying curves that at the present time 76 per cent of the working force is engaged part of the time on premium work and that nearly 50 per cent of all the man-hours time in the shops is for work done against standard time allowances and in a standard manner. The figures taken into account in computing the percentage of working forces and hours worked on the premium system are total figures which include the supervisory time as well as the time of the productive workers. Considering this, it can be seen that the premium system is a major and very important factor in our shop operation. It is so large a factor that we should be able readily to determine that the plan is a detrimental one or a very good one; that is, it either costs us money or it saves money. We shall endeavor to show that the latter is the case. For in the last analysis, the important question that the practical man wants to have answered is, "Does it pay?"

A GENERAL OUTLINE OF THE SYSTEM

The premium system employed in our shops consists, first, in making a detailed time and method study for each job, to determine the standard method and the time required to do a certain piece of work. A stop watch is used for this purpose in most cases. A typical time study of a machine shop drill press operation is shown with the reproduction of the "observation sheet" herewith. The number of observations made (ten in this case) varies with the importance of the work. Our experience has shown that great care must be exercised and close scrutiny given in making the time study and before determining upon the standard unit of time or before issuing the "standard operation rate card" (Form 1,029 reproduced herewith) for regular use in the shop. In the machine shop, for example, it is necessary to take into consideration the type of machine to be used. speed, feed, material, quantity on the particular order, etc. We have found that special care in establishing a standard rate is well repaid, for it enables us to adhere rigidly to the rule that, once established, a rate is never changed except as made necessary by improved methods or improved machinery for doing the work. In other words, a workman can proceed to develop his maximum capacity without fear that he will be penalized by a reduction of the standard time if he makes good premium earnings. This rate cutting has been one of the chief objections raised by workers to the premium and piecework systems in general in the past, and the reason for rate cutting lies primarily in insufficient consideration of all the production factors at the time the rate is determined. The details of the method, men, machines and means of doing a piece of work should be thoroughly studied, regardless of the time required to do this, and the standard can then be set close enough so that the company can afford to give the worker his share of the results of his ability and skill in bettering the time. When experience assures the men of a "square deal" they gain confidence in the plan, and this makes for a better measure of co-operation than is commonly found.

The men who make the time studies and determine the methods to be followed become very expert and command a good rate of pay and are worth it. Even such jobs as repairing wrecked cars, which at first thought would not seem to lend themselves to standardization or an accurate estimate of the amount of labor which should be required, are now often handled on a premium basis in our shops, for analysis has determined that most of our damaged cars come within one of several classes of wrecks, either a one-post, two-post or three-post wreck, etc. The time-study man observes the extent of the wreck, carefully examines the car-body members to be replaced and, from past experience and study, is able to estimate with remarkable precision the amount of time that will be involved in making the repair. The workmen who are then given this job note the time allowed and immediately set out to beat that allowance, and they use their heads and conserve their time, for it means money to them to do so.

Any man working on a standard job is given one-half the time saved in completing the standardized operation. That is, where a man does a ten-hour job in eight hours he receives one hour additional pay, or pay for nine hours for eight hours' work. The division of the savings on a "fifty-fifty" basis between the man and the company is considered fair and equitable by both parties. The company's saving is partially used, it is understood, to defray the expense of employing time-study men and of providing the necessary standards and clerical help, in order to give the workman the opportunity to increase his day-rate earnings.

In the operation of a system like this the use of the unit system of timekeeping is a necessity. Instead of assigning daily time cards to employees the time of each man spent on each job during the day is recorded on an "operation time card" (Form 1,002 reproduced herewith).

Under the old system of timekeeping still used in many places, a time card is given to the workman on which to record at the end of the day, according to his best remembrance, each job he has done during the day and the time it took him to do it. In most cases, he is expected also to enter the charge account number for the various jobs which he worked on. The disadvantages of this system, of course, are very apparent. It takes the man away from productive work, requiring at least fifteen to thirty minutes of his time to do "figuring" at which he usually is not adept. Jobs which do not take very much time are slighted in his record, because he does not want to go into any more detail than he has to. In some cases, a special timekeeper or checker has the duty of checking the work record with the man and his foreman and the assignment of the charge. But in neither case is the record returned anywhere nearly as accurate as with the unit job system, which we use in our premium system.

With this plan, the time card being worked on specifies one item of work. When the man changes his job, he also changes his time card. With the unit job system, the foreman determines in advance what the man's next job is to be, instructing his clerk to make out a time card showing the charge, standard operation number, the man's name, etc., and this card is placed in a rack, located adjacent to the departmental time clock, where the workman obtains it when he is ready to start work on the next job. The card on which a man is working is always turned in at night and a new card issued in the morning, as the card is a daily record only. As he takes a new card he punches the time recorder clock, which records in a decimal system the time at which work is begun on the particular job. When that job is completed he punches "out," thus printing in the time of completing the job, and at the same time he punches the new slip "in," which records the time at which he starts work on the new job to which that card assigns him, there being no loss of time between operations. The workman is not intrusted with any duties in connection with the timekeeping or record work other than merely punching the clock.

A "performance record" (Form 1,018 reproduced herewith), which is maintained in the main office of the shop, is of great value in checking up on the progress made over a long period of time. When an individual does the same job several times it is assumed that his efficiency should improve and that the time required to do the work will be reduced. This is not always the case, however, and variations from this natural tendency are followed up to determine the cause.

This performance record also makes possible a comparison of various men in doing the same piece of work. We have found cases where the time taken to do a certain piece of work, over a period of months, was remarkably similar, as far as it concerned a certain group of men, and that when this job was given to some one outside of the "ring" a considerably better record was made. The group in question had succeeded in deceiving the foreman to the extent that he thought they were doing very well, and, inasmuch as they were keeping within the standard, special attention had not been called to what was evidently an effort to control the amount of earnings on the job in question. This conniving would have some effect on the gross earnings made by the men, which would then be used as an argument for an increased day rate. A little "shake-up" as a result of this investigation and the assignment of new men to the job results in some saving in the net cost of doing the work.

It happens now and then that the time consumed in a given job is in excess of the standard time. When a record of this kind comes through, a "non-premium card" (Form 1,036 reproduced herewith) is made out by the timekeeper and sent to the general foreman's office, from which an investigation is started to determine why more time was taken than should reasonably be allowed. The "stock" reasons printed on the back of the form reproduced and shown in the reproduction are those used in connection with the work of the machine shop, and they differ, of course, for the other shops. This checking up on the reasons for exceeding the standard time, we find, has a decidedly good effect on the men in general.

FUNCTION OF THE FOREMAN

In our method of applying the premium system, the foreman has been made an important functionary. We have arranged a bonus plan so that he profits from the extension of the system. It is to his advantage, in this way, to co-operate to the fullest extent in furthering the establishment of standard rates and seeing to it that they are used after being established. All our foremen now like the premium system, though some did not like it at first.

The foremen have found, however, especially during the last few years, that this system is a great help to them, as it lightens their burdens of detailed supervision and thus enables them to give more time to the broader aspects of their jobs, such as planning of the work, devising improved methods, etc., in which they develop as leaders rather than drivers of men. The premium system supplies the incentive to reward and the check-up for failure that keeps the man on the job without some one standing over him.

The premium rates are arranged for, in the first place, largely on the authority of the foreman in the department. He has a time-study man assigned to work with him, and since his earnings from the bonus system depend on the percentage of net working time that is worked on premium in his individual department, he is interested in pointing out to the time-study man any new possibilities of jobs to be standardized. He is therefore also interested in approving these standards as correct after the time-study man has completed his work and in passing them on to the general foreman for approval.

From this procedure the responsibility for the proper operation of the rate after it is standardized rests in great measure with the foreman, and we find that we now get rates that are remarkably accurate and standards that are fair in their returns to both men and the company. Under this bonus plan the foreman does not profit from any excess earnings that the men may make, and as the performance records are subject to scrutiny the foremen give a good deal of care and attention to the rates before they recommend them as standard.

The foreman soon finds that the system is of assistance to him because the standard rate-card file is much more dependable than his memory as to methods of doing a job, or his pocket notebook if he kept one. Most of our foremen now use the records extensively in assigning work. If his assistant quits the foreman has an easier time in breaking in a new man. All he has to do is to hand him the standard job card on any particular piece of work and say: "This is the way to do it and this is the time it should take, if done right." The assistance afforded by these records is not as greatly needed for the day-to-day recurrent jobs and with a steady, competent gang of workmen as it is for the infrequent and varying jobs, such as wrecks, for example, which are rarely twice alike in the same week, but which do occur in almost exactly similar detail several times in a season. Even with this infrequent kind of job, as I mentioned before, if a regular crew were on the job, there would be no need to depend on the cards and records. But the effect of labor unrest (in many cases it seems like "labor rest") and the changing help from day to day has been generally felt, I am sure. The most trusted workmen were called to the colors, and the struggle to keep things going right and to hold to standards of maintenance with many new and frequently incompetent workmen seemed hopeless indeed. That was a time when the detailed records of jobs already standardized came in mighty handy. The card gave the gang leader or the machinist his instructions in definite form. Instead of telling the boy (or girl) we had to put on the job to drill fender gate hangers, we handed him (or her) a card showing exactly what was to be done and in what sequence. (See cut of standard operation card.) Here were clear, concise instructions which the new employee could carry out with the minimum amount of coaching from his foreman. This also applied, of course, to the old, experienced hands. As the time which the job should take appeared on the card, the employee could tell whether or not he was producing work economically, and the incentive of extra pay was there to urge him to do his best.

GOOD WORKMEN LIKE THE PREMIUM SYSTEM

Our men like and appreciate the premium system because it is of mutual profit to the company and to them. It gives them an opportunity to work under better conditions, for they are better satisfied to receive recognition for the actual labor they perform than to be without identity, as under the former system of flat day rates of pay. By making a man responsible for the performance of a definite task and setting a standard of attainment for him, his love of achievement, his desire for the good opinion of his superiors and his fellow workers and his personal interest all impel him to meet the standard and better it. The instinct of competition with fellow workers is usually very strong, and the friendly rivalry which is plainly in evidence is a powerful spur to accomplishment. A good man likes to beat the record of the other fellow, and incidentally it means money in his pocket to do so. The responsibility is a steadying and good moral influence, contributing to self-development. Promotion and wage increases are based on performance records, and they afford further recognition for merit and accomplishment.

The study that has been given to individual jobs has also resulted in the remedying of inefficient shop conditions and has served to increase the general plant efficiency. More attention is being given to planning and scheduling of work through the shop. Materials are delivered to machines and work places in advance of the time they are needed, and instead of having high-priced mechanics running all over the shop to secure some little bolt or screw, this is done for them more expeditiously and at lower cost by some lower-priced laborer. Thus undisturbed in his job, the workman is enabled to devote his entire energies to production, and by increasing his production to find additional money compensation.

WHAT DOES IT PROFIT THE COMPANY?

Getting back to the question originally raised of whether it is all a pretty theory or a real profit to the company, the answer is best found by referring to our individual records of jobs. The example shown on the forms reproduced with this article, which is typical of practically every operation standardized, shows a net reduction of productive shop labor cost, after the job was placed on premium as compared to the records of cost before the job was standardized. Referring to the observation sheet reproduced, it is seen that the average time taken to drill fender gate hanger castings previous to setting the standard time was 9.75 minutes per casting for the ten observations. The standard set as 6.0 minutes per casting was a reduction of about 40 per cent, and yet, as the operation time card shows, this standard time has been equaled or bettered eight times out of twelve jobs. The most serious failure is explained on the back of the non-premium card as "incompetent, new man," and even in this case the time taken by the workman was not as much as the average time required before standardization.

We are certain that 33⅓ per cent is a conservative figure for the average saving in time for standardized work over unstandardized. And since approximately one-half of the working time of the shop is on the premium plan, the net reduction in the payroll from this source is seen to be 16⅔ per cent. To be added to this is a saving equal to 10 per cent of the total payroll hours, which is obtained from the company's one-half share of the time saved by workmen earning premiums. This brings the total profit to the company up to more than 25 per cent of what the payroll would be without the premium system. This "income" or "saving" or "credit entry," or whatever one may wish to call it, is not affected by fluctuations in the rate of wages, as is the case with piecework and similar systems, for this plan is based on time units which do not vary, rather than on monetary values. This saving of one-fourth in the payroll or number of labor hours used for the output of the shops is really too low a figure to represent the returns to the company, when the productiveness of the average worker on flat pay basis in the immediate past is taken into account. I do not hesitate to express the opinion that our shop force and payroll would have had to be one-third to one-half larger in number and cost during the past year had we been operating under the flat day-rate wage system.

There are other accruing advantages to the company. On Dec. 31, 1920, we had 5,471 regular standard operations for repetitive jobs and 3,832 special standard operations for non-recurrent special jobs, approximately 10,000 carefully constructed records of labor performance effective and in use in our shops. This quantity of valuable data is being used and augmented daily and we would hesitate to place a monetary value on it. It is an asset to the organization that perhaps does not appear on the balance sheet, but is nevertheless the result of six years of planned, attained and recorded progress which we feel is of immense value, about correctly appraised in the words of some one who said: "Five years of this . . . will accomplish more than twenty years of rule-of-thumb information locked under the hats of shifting employees."

STANDARDS BEING SET FOR EVERY JOB

Due to the extreme care which it was necessary to exercise in the observations preparatory to the establishment of the standard time for various operations, the extension of the premium system, particularly at first, was a gradual and slow procedure. This is well illustrated in the chart referred to early in this article, showing the growth of the system since 1914. As every one in the organization has become more and more familiar with the details of the plan and the time-study men have become more skilled, the expansion of the system to new work has been more rapid, until now we are reaching standards for the very intricate and infrequent jobs. It should be mentioned also that there are many corollary savings to the company, resulting from expediting the movement of work through the shops, the more exact costs returned, the checking up on odds and ends of the work, etc. These are small matters in themselves, but in the aggregate they make entries on the credit side of the ledger of considerable importance, for "a penny saved is twopence earned."

Head time-study man	1
Time-study men in various departments	5
Chief inspector	1
Inspectors in various departments	6
Stenographer	1
File clerk	1
Total	15

Against the credits to the premium system noted in the past few paragraphs must be charged the expense incurred for the larger supervisory, office and inspection forces required. The number of employees used in these capacities for the operation of our premium system, with a shop force averaging between 500 and 600 men, is approximately shown in table above.

I question whether the time of the inspectors should be charged against the operation of the premium system. But there has been so much criticism directed against the various incentive methods for increasing production, because it is alleged that they reduce the quality of the work and increase the number of equipment failures, etc., that we have debited the premium system with the cost of the inspection department. Some would consider it necessary in any event. The net result is an increase of 2.5 to 3 per cent in the payroll to offset the 25 per cent decrease explained above.

There is no question in our minds but that the premium system does pay.

System Prevents Mistakes

The Numbering and Lettering of Axles, Gears and Pinions Makes Easy the Distinguishing of One from Another and Is of Great Assistance in Keeping Stock and Service Records

BY C. R. MCMAHON
Master Mechanic Des Moines (Iowa) City Railway

SOME difficulty is experienced in electric railway shops, especially by new men, in being able to distinguish the different types of axles, gears and pinions. Two different types may sometimes look almost alike, even to having the same number of teeth in a gear or pinion, for example. To alleviate this situation, the writer has installed the following system of numbering these pieces of equipment and it has been found to work out very satisfactorily.

Each of our different classes of motors has been assigned a letter, such as A, B, C, etc. All axles, gears and pinions are stamped with the corresponding letter and, in addition, a number. For example, the first axle for use with G. E. 57 motors is marked 1-A, the gear is marked 1-A and the pinion 1-A. The next one of each would be marked 2-A, etc. For the next type of motor, the axle is marked 1-B, gear 1-B and pinion 1-B, and the next one of each of the same type would be 2-B, etc. Two axles for different type motors may thus have the same number but a different letter, and the same system exists with gears and pinions. If an axle, gear or pinion is removed from a car, it is only necessary for the shop man to replace it with a new one having the same letter, and it is sure to be right. This system of lettering and numbering is also a great help in the keeping of stock and service records.

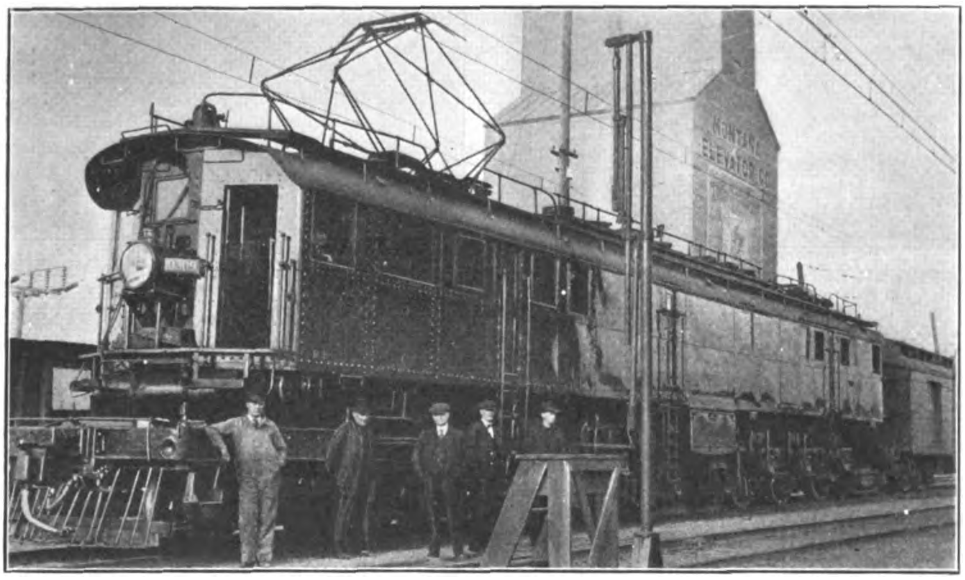
Axles are numbered on both ends by stamping. The gears are numbered either by soldering a brass plate on the web or by placing a piece of galvanized sheet iron around a spoke and fastening it with a rivet. The number is then stamped on the brass plate or the sheet iron strip.

RECLAIMING ARMATURE BEARING HOUSINGS

The armature bearing housings of solid frame motors frequently become worn so that they fit loosely in the motor housings. This condition may be readily overcome when a bearing is in for rebabbitting by forcing a steel pin through the bearing in a manner to expand it. This pin should be made just large enough to expand the bearing the proper amount to fit the particular housing, which means that it is necessary to have a different pin for each size of bearing. The pin should be made somewhat in the shape of a cartridge. It is not advisable to try to expand bearings to take up an extremely worn condition, for there is danger of cracking them.

Shop Notes from Deer Lodge

Chicago, Milwaukee & St. Paul Railway Shops at Deer Lodge, Mont., Maintain the Locomotives on the Rocky Mountain and Missoula Divisions—The Routine Procedure and Some Special Problems Are Covered in This Article—Practical Studies Under Way Continually for the Elimination of Weaknesses that Develop in Equipment



LOCOMOTIVE AT HEAD OF PASSENGER TRAIN ON THE MILWAUKEE

THE electric locomotives for the Missoula and Rocky Mountain divisions of the Chicago, Milwaukee & St. Paul Railway are maintained in the repair shops at Deer Lodge. The two divisions stretch from Harlowton on the east to Avery on the west, Deer Lodge being at the mid-point. At Deer Lodge are extensive shops, formerly used in steam locomotive maintenance, and here the division master mechanic, E. Sears, is located.

On the two divisions which join at Deer Lodge there are employed in freight service thirty-two General Electric locomotives of the type described in the issues of this paper for June 5, 1916, page 1072, and Oct. 21, 1916, page 888, and in passenger service ten Westinghouse locomotives of the type covered in articles in the issues for March 23, 1918, page 559, and March 13, 1920, page 510.

The passenger engines are operated through the entire 440 miles as a regular thing and the freight locomotives are similarly scheduled in some cases. This fact is mentioned by way of contrast with steam locomotive practice, which required the changing of locomotives on entering each 110-mile steam division of the railway.

CONSTANT INSPECTION KEEPS DOWN MAINTENANCE COSTS

The general method of looking after the locomotives is as given below. Special stress is put upon the intelligent upkeep of the equipment, involving a practical knowledge by operators and inspectors of the principles of the apparatus in their charge. To this end copies of a handbook of rules and regulations for the government of enginemen and inspectors are furnished to all of these men. This furnishes the answers to practically all questions apt to come up and contains an extensive set of questions by which the knowledge of the men can be gaged.

As to inspections, after every trip made by the locomotives there is a casual inspection requiring the services of a man and a helper for from one and one-half to two hours. Every six days the freight engines are ordered in on account of oiling, bringing into the shops seven or eight per day.

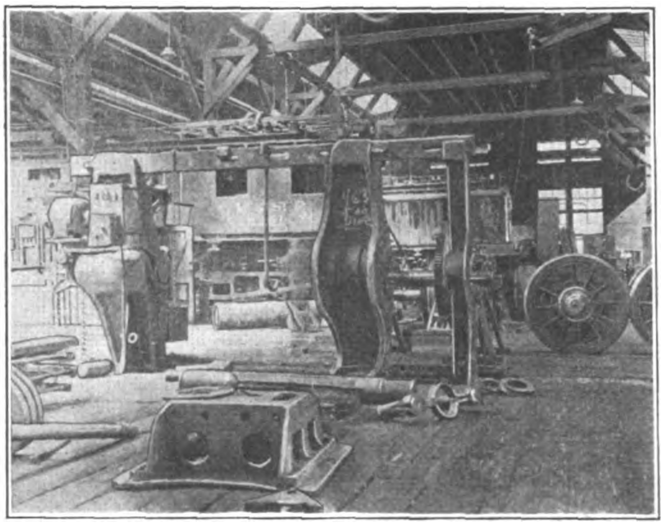
Passenger motors are inspected at the end of each trip like the freight machines. Oil gaging is done at the terminals, but all packing is done at the shops. Bearings are repacked every three months.

Every 3,500 to 4,500 miles the locomotives are given a thorough, daytime inspection, requiring the following force of men: One for the traction motors and pantagraphs, one for the testing and setting of relays and two for work on controllers, interlocks and other operating devices in the cab.

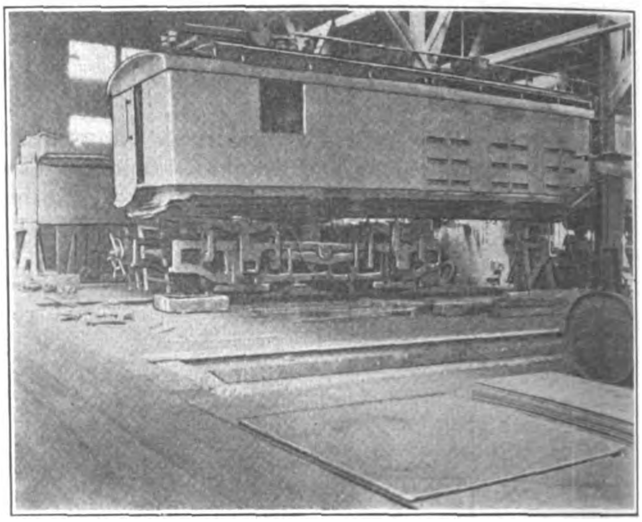
FLANGE WEAR DETERMINES WHEEL LIFE

In addition to the above there is a wheel inspection every week. The hardest wear on the locomotives comes on the wheel flanges and the main journal bearing liners; hence special attention is concentrated on flange and lateral wear. In checking flange wear a square steel gage, suitably notched on the four sides, is used, giving four regular flange contours. As thin flanges ultimately determine the scrapping point of the wheels they are watched with great care, and the wheel rims are turned until they reach a thickness of $1\frac{11}{16}$ in. for the General Electric and $1\frac{7}{8}$ in. for the Westinghouse locomotives. There is yet $\frac{1}{4}$ in. to go in these cases before the tire is said to be worn out.

The general foreman turns in each week a report for each locomotive examined showing the condition of the flange of each wheel by gage number (1, 2, 3 or 4).



SHOP VIEW AT DEER LODGE—BIG WHEEL PRESS IN FOREGROUND



LOCOMOTIVE CAB RAISED FROM TRUCK FOR TRUCK OVERHAUL

Lateral clearance for each main journal is also reported, as well as the clearance between the motor brushholders and the risers of the commutator.

A weekly report is also made of tires turned, by locomotive and wheel numbers, and of lateral wear taken up. An inspection of the records for a week just previous to the writer's visit to the shops showed the larger part of the flanges to be coming within the range of No. 3 gage, the lateral clearance to be running from 1 in. to 1½ in. and brushholder clearance about $\frac{3}{16}$ in.

During a similar week forty-four flange defects were corrected and twenty-four cases of excessive lateral wear were cared for.

After the close of the railroad's fiscal year, ending with June, the mechanical department makes up a detail record of the cost of maintenance of all parts of the locomotive in detail. The report covers labor and materials for the following items: Pantagraphs, motors, control, lights, motor-generator sets, heaters, fuses, motor brushes, miscellaneous brushes, locomotive body, trucks and wheels, air brakes, compressor, flange oilers, sanders, brakeshoes, draft gear, speed recorders, headlights, oiling, regeneration, heating boilers, testing, supervision, painting, meters, lightning arresters, gear grease, gears and pinions.

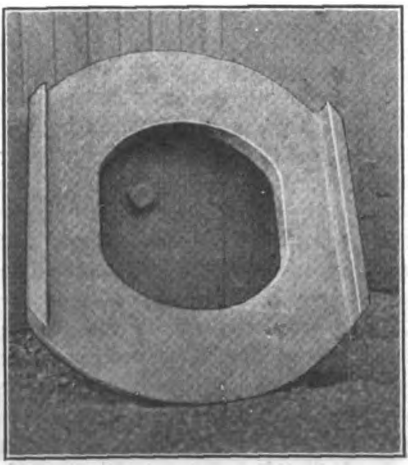
At Deer Lodge, as in all railway shops, there are practical studies under way continually for the elimination of weaknesses that have developed in equipment or for the improvement in practices for the sake of operating economy.

One of these is in connection with the bearing liners which limit lateral play of the motors on the axles. The liner is carried on the inside end of the journal box. It consists of a cast-iron washer faced with a brass or fiber plate. To prevent turning of these liners they are now being cast with two parallel lugs which project over the journal box. Photographs are reproduced herewith to show this construction.

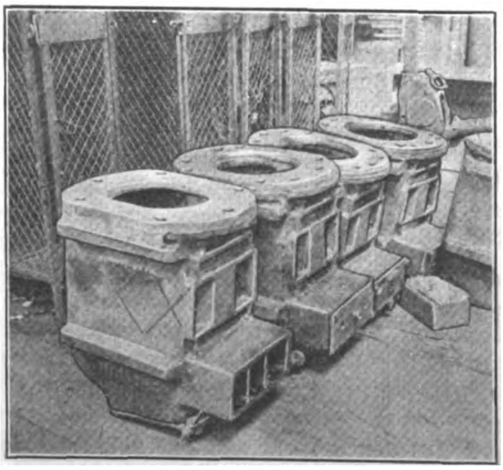
Excellent results are being secured with the type of motor bearing shown in still another illustration. This is a cast-iron bearing made of "Hunt-Spiller" metal, with spiral grooves, ¼ in. deep, filled with babbitt. The babbitt used is 4X nickel babbitt. These bearings have made as high a mileage as 60,000.

In "spotting" locomotives about the roundhouse 220-volt current is used with the earlier locomotives, the circuit being plugged in on the ground side of the controller to two motors. The machine is then operated from a stationary controller. On the new locomotives provision is made for putting the spotting current on all of the motors through the regular controller by means of a single-pole double-throw switch provided for the purpose.

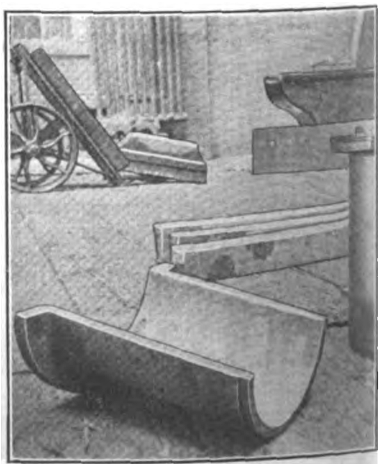
Realizing the importance of extreme care in the handling of the high-voltage equipment on the electric locomotives, the railroad has issued strict instructions



NEW FORM OF BEARING LINER WITH LUGS TO PREVENT TURNING



JOURNAL BOXES WITH NEW WEARING PLATES IN POSITION



BEARING OF HIGH GRADE IRON WITH BABBITT-LINED SPIRAL GROOVES

regarding safety precautions. The following quotations are taken from the rule book and illustrate this point:

CAUTION

No repair work or corrections shall be attempted, except by those duly authorized, who will first see that all switches controlling the circuit on which work is to be done are open. Before undertaking any work in connection with the electrical apparatus or wiring, they should ascertain just what is to be done in order to do it with as little delay as possible, and at the same time use care for protection of themselves and others.

When repairs are made on the road, all high voltage wiring and electrical apparatus must be treated the same as though it were energized even though the collectors are down, until the man in charge has been notified that work is to be done on it. Ropes are provided for holding the pantagraphs down and both pantagraphs and trolley pole should always be tied down when work is to be done on any of them, the wiring between the pantagraphs and main switch, or lightning arrester, when the locomotive is standing under the trolley wire.

RULES GOVERNING EMPLOYEES IN OTHER THAN TRAIN SERVICE

First—Every employee whose duties are in any way connected with the operation or maintenance of the electric and air-brake equipment used on electric locomotives will be required to have a knowledge of the apparatus with respect to its operation, and safety to himself and others. He will be subject to examination covering same.

Second—Only authorized employees shall work on or about the air-brake and electric equipments.

Third—Only authorized employees shall move electric locomotives.

Fourth—Shop employees and inspectors on the road or at terminal shall not work on or about the electric apparatus on electric locomotives until after the pantagraph and trolley pole have been lowered or the trolley wire de-energized.

Fifth—In case of failure of the automatic devices on the pantagraph, and it becomes necessary to operate the pantagraph, this shall not be done until after the main and auxiliary switches are opened. The pantagraph must then be operated with the insulated pole provided for this purpose.

Sixth—Preparatory to working under a locomotive employees shall first open the main switch.

Seventh—Employees working on or about electric locomotives shall protect themselves by the use of a red flag by day and a red light by night.

Eighth—In case of accident to an employee the nearest company physician shall be immediately notified and all aid rendered in accordance with instruction chart on "First Aid to the Injured." The office of the district master mechanic must be notified immediately of all accidents.

Welding Steel Wheel Flanges Successfully

E. B. GUNN, superintendent and master mechanic Western Ohio Railways, Wapakoneta, Ohio, has had unusually good success in building up worn steel wheel flanges by means of electric welding. During the two and one-half years that this practice has been followed 200 wheels have been welded with only three failures. From 40,000 to 50,000 miles on the average is obtained from these wheels after welding. The method followed by Mr. Gunn is somewhat different from that employed in many shops, and this may account for his greater success. His process was fully described in the ELECTRIC RAILWAY JOURNAL, issue of July 17, 1920, page 129.

Charting Conditions of Air-Brake Equipment

Description of an Air-Brake Test Using a Recording Pressure Gage to Indicate the Condition of the Equipment and Provide a Permanent Record for Future Use

BY KENNETH R. LEWIS

ONE of the things which vex an air-brake foreman most is to have a car returned for giving trouble but a short time after its equipment has been overhauled, tested and put in supposedly perfect condition. In order to insure that the equipment was in the best condition possible after being overhauled, the following air-brake test was devised to give a positive indication of the conditions of the various pieces of apparatus and to provide a permanent record to be filed for future reference.

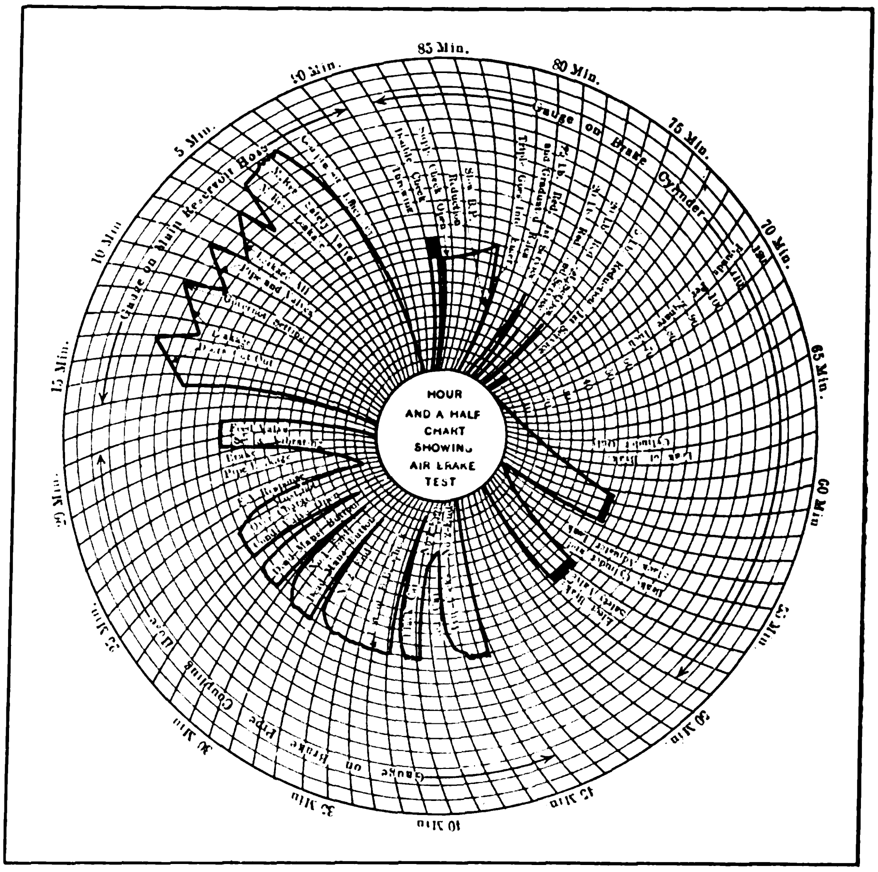


CHART OF AIR PRESSURE IN BRAKING SYSTEM DURING TEST

The apparatus used for making the test consisted of a 12-in. recording pressure gage registering up to 125 lb. per square inch and making one revolution in one and one-half, three or six hours, depending on the gearing used. The usual tests required about one hour to complete, so for these tests the slowest speed was used in order that the chart could be more easily read. Each car was tested after its equipment had been repaired and overhauled, and cars which had been in collision or in trains which had run by signals in operation were tested immediately after the occurrence and the records filed for use in case there should be a claim necessitating definite information at some later time regarding the condition of the brakes on that particular car.

Before this method of testing was inaugurated, it

seemed to be a habit of motormen to claim brake failure as the easiest explanation in case of trouble on the road. After a few such cases had been tested, and the charts produced as evidence that the equipment was in satisfactory condition, these men ceased to blame the equipment and admitted that they had misjudged the stopping distance. The test also proved an excellent check upon the workmanship of the repair men in overhauling.

When this method of testing was first started, a majority of the cars tested after being overhauled were rejected for excessive leakage or improper working of the valves and required additional work to put the equipment in proper condition. When the men learned that poor workmanship could not get by, the equipment was turned out in much better shape and passed all tests without difficulty. Flat wheels and brake troubles that previously had been mysterious, and which could not be directly located in the old way of testing by applying and releasing the brakes and watching the brake cylinder, showed up immediately on the chart.

The accompanying diagram shows a sample chart that was made up as a guide for the man making the test and was used for comparing and checking other charts as they were obtained from cars under test. The following instructions for making the test were also supplied to the men:

INSTRUCTION FOR TESTING AIR BRAKE WITH RECORDING GAGE

Connect the gage to the main reservoir and place the brake handle in release position.

1. Start the test with the main reservoir empty. Close both door and control-pipe feed valves. Ground the synchronizing wire so that the governor will not operate to cut out the compressor. Cut in the compressor switch and allow the compressor to pump up pressure until the safety valve opens. The gage chart will show compressor efficiency; also the setting and operation of the safety valve from this test.

2. As the main reservoir pressure is building up, check the car gages at both ends of the car at several pressures to see that their indications correspond to the pressures indicated by the recording gage. If not, they should be properly set.

3. Remove the ground from the synchronizing wire so that the governor will cut out and stop the compressor. Then let the recording gage operate about one minute to register the main reservoir and reservoir pipe leakage and the leakage back through the compressor check valves.

4. Cut in both the door and the control feed valves, and after all piping and valves are charged up and the brakes released allow the compressor to operate normally one or two cycles. The gage chart will then indicate the governor setting and, from the time and rate of reduction of pressure after the governor cuts out, the rate of leakage of all valves and piping combined will be recorded.

5. Repeat the last test with the door feed valve cut out in order to record the leakage without door engines and piping cut in.

GAGE ON BRAKE PIPE

Remove the recording gage and tap it on the brake pipe coupling hose.

6. With the brake handle in the release position, allow the gage to register one or two minutes so that the chart can record the feed valve setting and vibration. Meanwhile check the brake-pipe hands on the car gages at both ends to see that they are properly set.

7. Make a 5-lb. brake-pipe reduction and then lap the brake valve handle. The recording gage will then indicate the rate of brake-pipe leakage. Should the pressure increase instead of decrease, this indicates a leaky brake valve.

8. When the brake pipe has been reduced to a low pressure, return the brake valve handle to the release position. The recording gage will indicate the response of the feed valve or show up any restriction in the piping. Note that pressure does not build up higher than the feed valve setting as would be caused by a binding or sticky feed-valve piston.

9. Pull the conductor's valve from the other end of the car in order to test the rope for strength. The test chart will indicate whether the reduction of brake pipe is enough to cause an emergency application of the brakes with the brake handle in release position and whether there is a restriction in the piping.

10. Operate the "dead-man's button" on the No. 1 end of the car, then after closing and when the brake pipe is again fully charged, operate the dead-man's button on the No. 2 end of the car. The gage chart will indicate that the brake-pipe reduction is heavy enough to apply the brakes in emergency with the handle in the release position on the brake valve.

11. With the brake pipe fully charged, make several heavy applications of the electro-pneumatic brake in order to record the fact that the check valve does not leak. Any reduction of brake-pipe pressure shown on the chart indicates a leaky check valve in the line ahead of the electro-pneumatic brake tap.

12. With the brake handle in the release position test out each automatic trip valve allowing time between tests for brake pipe to recharge.

GAGE ON BRAKE CYLINDER 5-IN. PISTON TRAVEL

Remove the recording gage and tap it on the brake cylinder.

13. Apply the electro-pneumatic brake until full pressure is reached and the safety valve operates long enough to record the setting pressure.

14. After a full electro-pneumatic brake application, place the brake handle on the electric lap position for two or three minutes. The gage chart will indicate the combined brake cylinder and slack adjuster leakage.

15. Release the electro-pneumatic brake and take up the slack adjuster to give a 4-in. piston travel and repeat last test. The gage chart will then indicate the brake-cylinder leakage without the slack adjuster leakage.

16. Fully release the electro-pneumatic brake, then turn the snap switch to the "off" position. Allow the gage to register for one minute in order to show the leak if any that takes place through the electro-pneumatic brake-application valve.

17. Make a 5-lb. brake pipe reduction, first service position. The gage chart will indicate whether the triple valve operates properly on slight reduction.

18. Make a 20-lb. reduction, first service position, to indicate on the gage chart that the brake cylinder pressure given is correct for this reduction. Release the brakes.

19. Make a 20-lb. reduction, second service position, to show that the triple valve does not go into the emergency position. Release the brakes.

20. Make a 25-lb. reduction, first service position, and then graduate the release, allowing time between graduations for the chart to record the pressure at each step. To pass the test, the chart should show at least three graduations of the brake cylinder pressure.

21. Place the brake-valve handle in the first service position and leave it there until the pressure is reduced to zero. The gage chart will indicate length of time required for the triple to go into emergency position.

22. Leave the brakes in the emergency position several minutes so that the gage chart will show how the brake cylinder pressure is maintained after an emergency application.

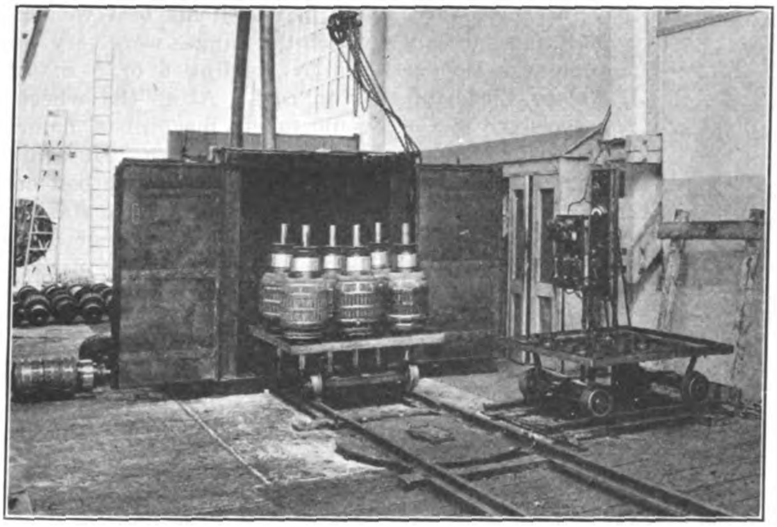
23. Move the brake-valve handle several times from electro-pneumatic to automatic position in order to show on chart the operation of the double check valve from side to side.

The above instructions, of course, apply particularly to but one class of equipment, and these would need revising for other types. However, by following through these tests and comparing with the chart, the user can make any changes necessary for other types of equipment.

Since the inauguration of this method of testing the number of defects causing detentions to service has been materially reduced.

Arc Welding and Motor Maintenance

Equipment Men of the Electric Railways of Ohio, Pennsylvania and West Virginia Gather for Semi-Annual Exchange of Experience—Considerable Doubt of Economy or Safety of Welding Wheel Flanges Develops—Motor Maintenance Talk, Illustrated with Stereopticon Slides, Given



BAKING OVEN AND TRANSFER TRUCK

THE Association of Electric Railway Men, which comprises the equipment men of the electric railways in Ohio, Pennsylvania and West Virginia, held a meeting in the offices of the Richland Public Service Company, Mansfield, Ohio, on Dec. 7, 1920. There were about forty-five in attendance, a number of whom stayed over to visit the Mansfield plants of the Ohio Brass Company and the Westinghouse Electric & Manufacturing Company on Dec. 8. A full day of informal discussion, led off by a talk on electric arc welding by A. M. Candy, Westinghouse Electric & Manufacturing Company, and illustrated with stereopticon slides, and another illustrated talk on railway motor maintenance by J. S. Dean, also of the Westinghouse company, occupied the equipment men on Tuesday. They were the guests of H. A. Cowgill, general superintendent of the Richland Public Service Company for luncheon, and of the Ohio Brass Company for dinner and a theater party Tuesday evening.

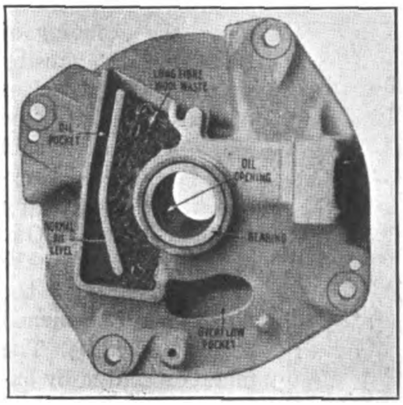
Mr. Candy's talk on arc welding occupied the entire morning session, and it proved of great interest to the master mechanics. The substance of this talk, together with many of the illustrations used, were published in the issue of the ELECTRIC RAILWAY JOURNAL for January 15, 1921. In general he endeavored to show the scope of electric welding work and explained with illustrations some of the technical aspects of the subject, such as the effect of polarity, the effect of long and short arcs, of too high current, too low current, etc., and gave a brief description of the several systems of welding and their relative efficiency.

In the discussion which followed Mr. Candy's talk I. E. Church, Pittsburgh (Pa.) Railways, told about welding some flexible couplings, made up of two halves with twenty-eight holes in the head in which as many 1¼-in. pins engaged. The holes became worn, some of them as much as to 2 in. in diameter. These were filled up by electric welding and the holes rebored with very satisfactory results.

The discussion then turned to the subject of welding worn flanges on car wheels. It developed that there was considerable difference of opinion as to the advisability of welding flanges, particularly for use on high-speed interurban cars, from the standpoint of safety. There was also expressed a good deal of doubt as to the economy of building up flanges by welding on any class of car wheels. One master mechanic said that he had had varying results in trying to weld flanges. One operator would make a job such that the flange could be turned readily in a lathe. The metal deposited by another would be so hard that it could not be machined at all and could only be dressed up by grinding. The latter flanges, however, never have worn out, he said. He doubted the advisability of using built-up flanges on high-speed cars for he had found that there was a tendency for the flange to check. This has been overcome to a certain extent by welding one layer of metal and then permitting this to cool before building up further, and so on until the three or four layers necessary are completed.

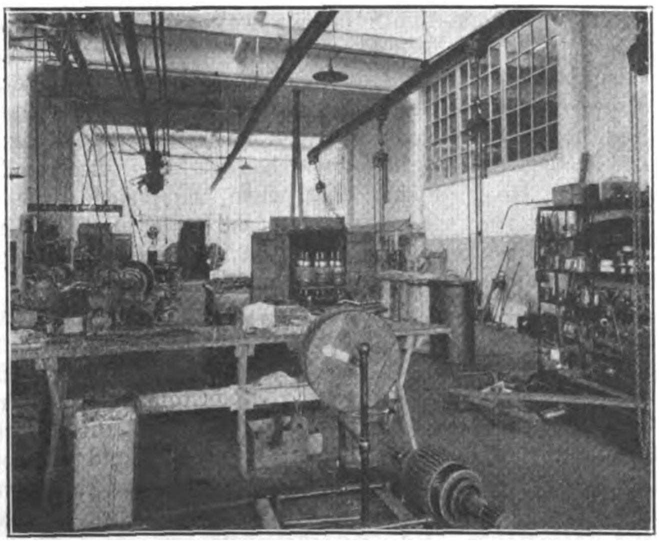
W. H. Goodenough, Mansfield, Ohio, said that he had found it desirable to build the flange up with one layer about one-eighth of the way around the wheel and then go back and start the second layer, thus permitting a certain amount of cooling between layers. However, he said that the welding of axles and wheels had been discontinued because he had had six cases of broken axles, all of which had been electrically welded. He also said that when the welded wheels came back for reshaping it is possible to turn only the tread, and the only means they have available for shaping the flange is a portable grinding outfit.

F. R. Phillips, Pittsburgh Railways, explained that his company was planning to build up flanges on city car wheels by means of an automatic outfit which assured a constant length arc and constant current during welding. He pointed out that the Pittsburgh company now employs sixteen arc welders and nine or ten gas welders, and that plans for a more extensive use of welding processes for reclamation work are being formulated. He said that both electric and gas welding are used because some jobs can be done more economically with one than the other. Referring to the cost side of welding flanges on wheels, he said that before the war a study was made to determine the exact cost of this work, and it was found that with the then prevailing prices for wheels it cost $2 more to reclaim a wheel than to buy a new one. He thought that as wheel prices increase the opportunity for welding becomes more favorable. He contended, however, that with lowering wheel prices, unless the cost of labor is very much reduced, it will not be economical to weld. He said he had had ten years' experience in this welding work and that he was learning new things about it every day. One of these things is that it is possible to carry the idea of reclaiming by welding entirely too far. For example, he has found that it costs more to fill up and rebore the holes in the hangers for Bemis trucks, as they become worn, than it does to buy new hangers. George H. Kelsay, Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, said that he had experimented with building up flanges, but had found that they chipped off readily and showed other weaknesses and he doubted very much the value of the results obtained. He had not yet been able to bring himself to the point that he was willing to be responsible for the use of wheels thus reclaimed on high-speed cars.



SECTION THROUGH ARMATURE HOUSING, SHOWING SYSTEM OF OIL WASTE LUBRICATION

One man said that his company had fifty Peter Witt type cars equipped with 26-in. wheels on which it was impossible to get even one turning, and the life of the wheels was therefore very short. He had been able to lengthen the life materially by building up the flanges and was now buying an automatic welding outfit for this purpose. These cars, he said, run at 50 m.p.h., and there has been no difficulty with the welded wheels. Mr. Phillips interjected that his company has been experiencing this same short-life difficulty with the small diameter wheels, but that he is not welding them because of the molecular change which takes place in the metal and he did not want to take a chance on such wheels.



GENERAL VIEW OF SHOP AND DIPPING AND BAKING OUTFIT

A. B. Creelman, Youngstown (Ohio) Municipal Railway, stated that he had such poor results from the welding of axles and armature shafts that he had not attempted wheels. He said excellent results had been obtained from welding motor caps and various other reclamation work about the shop, but he was very skeptical of the economy and safety of welding flanges. He said that one might get away with it, but that one serious accident due to a defective wheel would offset more saving than could be realized in years. He said he had experimented with building up thin flanges and had used his best welder. Some 34-in. wheels on which the flanges were very thin were built up to standard by welding 6 or 8 in. at a time and permitting it to cool. After the wheel was done, he said, you could take a machinists' hammer and knock out a piece of flange with ease. He said it might be possible that in this case the flange had been too thin to form sufficient body on which to start welding.

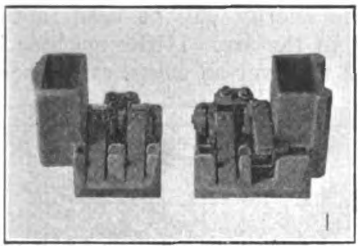
Some one pointed out that the steam railroads are doing some welding of flanges for freight engines, but are not doing any of this for passenger engines. He said they had not felt they could take a chance and had taken the position that welding of flanges on wheels used in high-speed service was placing too much confidence in one man—the welder.

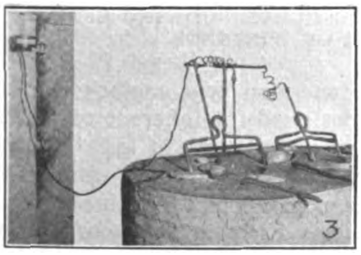
Another man said he had found that the labor involved in welding and turning wheels was so great that there was no economy in it. Still another member testified that he had some wheels welded and rewelded and that large pieces broke out of the flange both after the original weld and after rewelding. He thought this might possibly be due to running the cars over girder groove rail in the city.

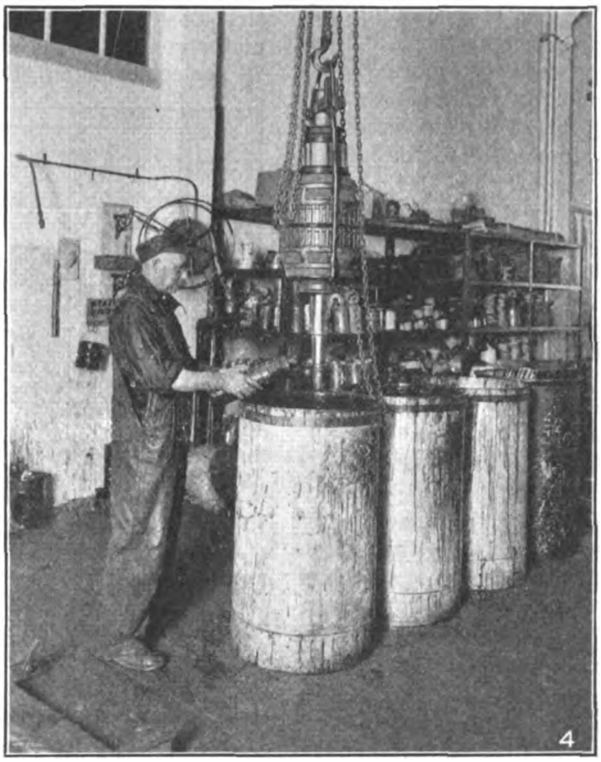
One of the men present referred to the method of welding flanges used by E. B. Gunn, master mechanic Western Ohio Railway, Wapakoneta, Ohio, whereby the worn wheel is turned as near to proper contour as possible without cutting away an undue amount of the tread in order to cut out the groove at the throat. This groove on the inside of the flange is then filled up by means of electric welding, rather than to build up practically an entire flange without turning the tread at all. This practice saves perhaps ¼ in. or more on the tread that would otherwise have to be turned off, and at the same time provides a large body of solid metal in the flange to support the welded metal. The speaker thought that this scheme might account for the apparent success attained by Mr. Gunn. The latter's method of welding wheels was fully described in a paper by him in the July 17, 1920, issue of the ELECTRIC RAILWAY JOURNAL, page 129.

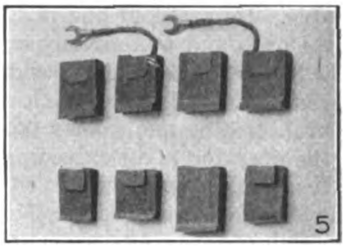
One member had made a careful cost study of the case where one wheel of a new pair developed a thin flange after it had been in service only a comparatively short time. In such a case, if the wheel is caught before the flange is worn too thin and built up by welding, and the pair put in the lathe and both wheels turned at the same time, it is possible to save about $10 over the cost of pressing off the worn wheels and pressing on new ones, taking into account the time involved, scrap value, etc., versus the extra wear derived from welding and the labor involved in that. He said that if the flange is worn too thin, however, the wheel is lost. This rapid wearing of one wheel is frequently due to the pair being not properly matched for diameter. Mr. Kelsay and Mr. Phillips confirmed the comment that the checking of wheels for diameter cannot be intrusted to the manufacturers, but must be done in the railway shops.

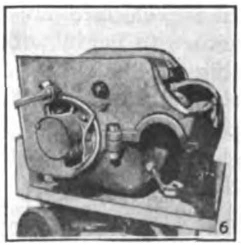
P. J. Wood, Buffalo and Lake Erie Traction Company, upon being asked for his experience, said that he was having very good success with built-up flanges. He has been following this practice for eight months, using simply a resistance type welder and trolley current, and has had no trouble. The flanges built up in this manner are not turned, but are put in service just as the welder leaves them. Mr. Wood said that after the wheels have been back in service for a short time the flange wears smooth and you cannot tell where the weld was made. He considered that there was no object in spending time to machine the flange after welding, for if the welding is well done it very quickly smoothes out and there is no danger at all. These wheels are used on high-speed interurban service.

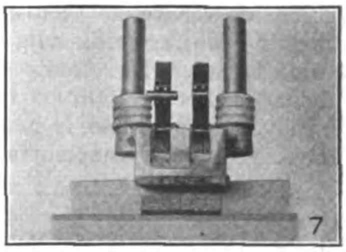












1.—New type insulated point brush-holder for 49, 56 and 68 railway motors.
2.—Through bolt type housing—Split frame motor.
3.—Pyrometer to measure temperature of babbitting metal.
4.—Dipping armature, showing armature clamping details.
5.—Side wear on carbon brushes with and without pigtails.
6.—Old style 101-B motor adapted for use of through bolt housing shown in No. 2.
7.—The effect of long and short brush-holders, contact tips on top carbon wear.

Several of the equipment men expressed astonishment that the wheels were permitted to go back into service without turning or smoothing up of the welded surface and denoted the feeling that such wheels would be much more likely to climb the rail. As to the cost of welding, Mr. Wood said he did not know the cost, but that the life of the wheels had been increased 25 per cent.

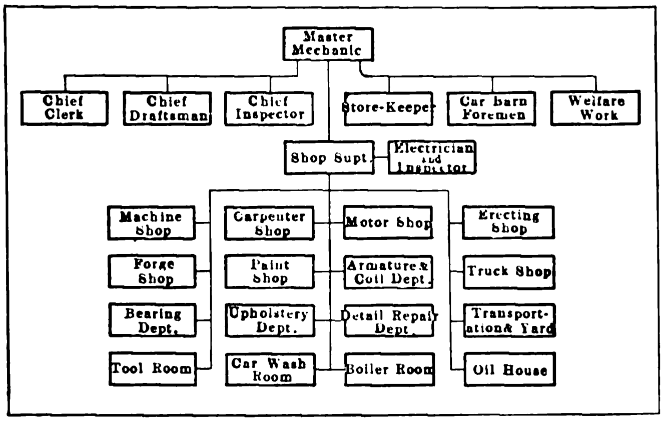
Mr. Creelman concluded the discussion on welding rail flanges by saying that it seemed to be just a matter of taking a chance, and if you got away with it it was all right.

A portion of the talk by Mr. Candy had been devoted to the subject of welded rail bonds. He said that for this purpose one might as well forget anything but a steel tip or steel face bond for welding by the electric arc process. It is so difficult to weld the copper to the rail that it is impractical.

Some one raised the question as to how successful welded bonds have been and the relative merits of gas welding and electric welding of bonds. A representative of the Ohio Brass Company answered that he knew of one road which had installed 60,000 steel tip bonds with the gas weld process and had found the installation most satisfactory. As to the relative merits of the two methods of welding bonds, he said that there was no particular advantage, but that gas welding had been used largely thus far because it had been on the market longer, though he said the arc welding process will supplant the former. He believed this to be the case mainly because of the fact that electric railways always have power at hand, whereas it is sometimes very difficult to secure acetylene gas. This is comparatively easy now, but it was very difficult during the war. The question then becomes one of whether a company wants to go to this trouble or to make use of the energy it has directly at hand. He said that the Ohio Brass Company is putting on the market a portable motor-generator set for electric welding of bonds, which is being made for this company by the Wilson Electric & Bonding Company, New York.

Mr. Phillips commented that it is easier to break in a gas welder than an arc welder. He added that lack of skill is the reason for more failures of arc welds than anything else, and he thought this was largely the result of the very scant instruction usually given men who are put on this kind of work.

Mr. Church spoke briefly of this problem of training welders. He said that one could take two apparently equally good men, give them the same training and one would make a good welder and the other would be no good at all. He had found that if a man were of a nervous temperament he would never make a good welder. He said it takes a slow, steady, conscientious man to make a good welder, though he may have less


Master Mechanic
Chief Clerk
Chief Draftsman
Chief Inspector
Store-Keeper
Car barn Foremen
Welfare Work
Shop Supt.
Electrician and Inspector
Machine Shop
Forge Shop
Bearing Dept.
Tool Room
Carpenter Shop
Paint Shop
Upholstery Dept.
Car Wash Room
Motor Shop
Armature & Coil Dept.
Detail Repair Dept.
Boiler Room
Erecting Shop
Truck Shop
Transportation & Yard
Oil House

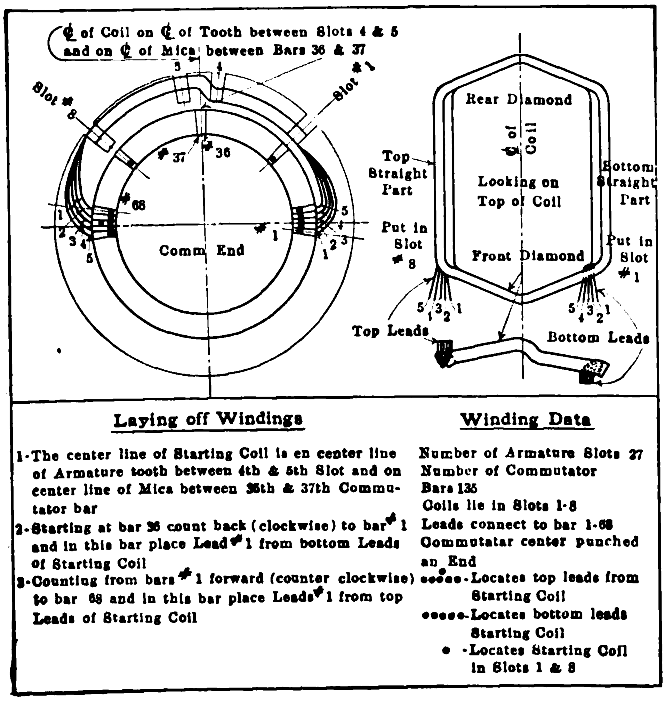
ORGANIZATION CHART

intelligence than another who is more active and excitable. He spoke of one man who had been welding only a month and was already doing excellent work. Others who have been doing welding work for more than a year get hard spots which cannot be machined, causing broken lathe and planer tools, etc. He considered that the operator is an exceedingly important factor in electric welding work.

Answering a question, Mr. Candy said that the job of welding thin cast-iron sections is a very difficult one with the electric arc process. Cast iron is a weak structure to begin with, and as welding progresses the cooling strains set up are very likely to crack the metal at some place other than at the point of welding. The best way to do this kind of welding, he said, is to pre-heat the piece just as it would be handled for gas welding.

ARC WELDING NUTS ON BOLTS

In answer to another question on the use of arc welding for fastening nuts on bolts to keep them from working loose, Mr. Candy said that the Chicago, Rock Island & Pacific Railroad has used this method extensively. A spot weld is made between one face of the nut and the adjacent surface, or between the nut and the bolt. He said this was the only case of this practice that he knew of and he did not know its value.


℄ of Coil on ℄ of Tooth between Slots 4 & 5 and on ℄ of Mica between Bars 36 & 37
Slot #8
Slot #1
5
4
#37
#36
#68
#1
1
2
3
4
5
Comm End
Rear Diamond
℄ of Coil
Top Straight Part
Looking on Top of Coil
Bottom Straight Part
Put in Slot #8
Front Diamond
Put in Slot #1
Top Leads
Bottom Leads

Laying off Windings

1-The center line of Starting Coil is en center line of Armature tooth between 4th & 5th Slot and on center line of Mica between 36th & 37th Commutator bar

2-Starting at bar 36 count back (clockwise) to bar #1 and in this bar place Lead #1 from bottom Leads of Starting Coil

3-Counting from bars #1 forward (counter clockwise) to bar 68 and in this bar place Leads #1 from top Leads of Starting Coil

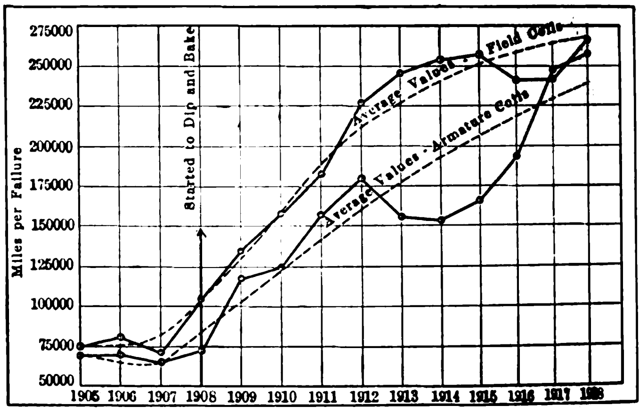
Winding Data

Number of Armature Slots 27
Number of Commutator Bars 135
Coils lie in Slots 1-8
Leads connect to bar 1-68
Commutatar center punched an End
○○○○○-Locates top leads from Starting Coil
●●●●●-Locates bottom leads Starting Coil
● -Locates Starting Coil in Slots 1 & 8

ARMATURE WINDING LAYOUT—RAILWAY MOTOR

In welding special trackwork Mr. Candy said that it was his opinion that best results could be obtained through the use of the graphite electrode process if men are available who know how to use this process.

Mr. Candy then endeavored to answer the question as to what is the most economical electric welding equipment. He explained that when using a metal electrode the voltage across the arc should be about 20 volts. If a 500-volt source of energy is being used, this means that it is necessary to dissipate 480 volts in resistance, or that only 4 per cent of the energy consumed is used in the welding work. If welding is being done with a 110-volt supply, then 90 volts must be dissipated in resistance, or only 18 per cent consumed in useful work. If a motor-generator set delivering 60 volts is used, this means that 40 volts will be dissipated in resistance and that 33⅓ per cent of the energy will be used in the motor-generator set and in the arc. If the machine is 75 per cent efficient, then the over-all efficiency is about 23 per cent. With the one-man type motor-generator welding outfit which is designed for inherent regulation to take care of the variation in length of arc, the over-all efficiency obtained is from 50 to 60 per cent. This is therefore probably the most efficient machine.



DIPPING AND BAKING CURVE SHOWING EFFECT ON LIFE OF WINDINGS

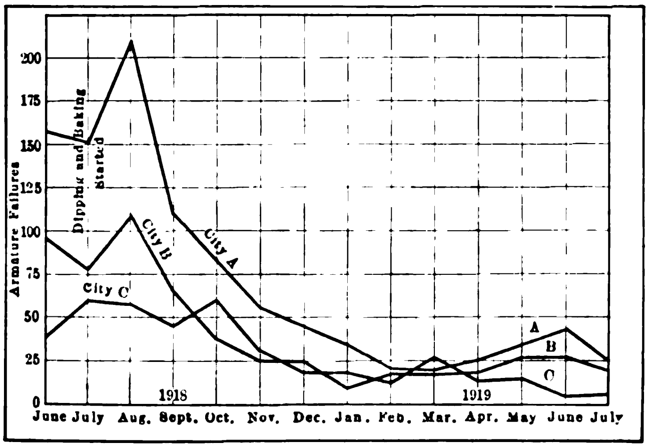
J. S. Dean, Westinghouse Electric & Manufacturing Company, then gave a talk, illustrated with stereopticon slides, on many phases of the maintenance work on electric railway motors, many interrogations being answered as he went along. A great many of the pictures shown were from the shops of the International Railway, Buffalo, N. Y. Among these was an organization chart of the Buffalo mechanical department, some of the shop-record forms, equipment for dipping and baking of armatures and a number of other pictures, some of which are reproduced herewith. In general, Mr. Dean's talk was a sketch of the maintenance practices followed on various roads which have brought good results and the varying experiences in motor maintenance problems.

Speaking of the method of preparing armatures followed at Buffalo, Mr. Dean said that all armatures newly wound or repaired are dipped and baked. If an armature does not come in for repair otherwise, it is brought in anyway every two or two and a half years for dipping and baking. In Buffalo the armatures are dipped with the pinion end of the shaft down, immersing the armature up to the commutator neck. The lower end of the shaft is protected from the varnish by a sleeve which is fitted with packing at the upper end.

Some companies roll the armatures in the varnish instead of dipping them, in order to avoid having to protect either the armature or the pinion end of the shaft. Mr. Dean could not say whether this method was as satisfactory as the dipping method, but he felt skeptical about it. He also mentioned that P. V. C. See, Northern Ohio Traction & Light Company, Akron, Ohio, is considering the possibility of spraying armatures instead of either dipping or rolling.

Turning to the matter of drying armatures after dipping, Mr. Dean said that it had been proposed to spin them in a lathe, but he thought this might throw out too much of the varnish.

Some companies are considering the desirability of dipping and baking the motor frame as well as the armature, that is, putting the whole frame with the field coils in place through this process, instead of simply treating the field coils separately. The idea is that there is a possibility of damaging the coils in installing them after baking.

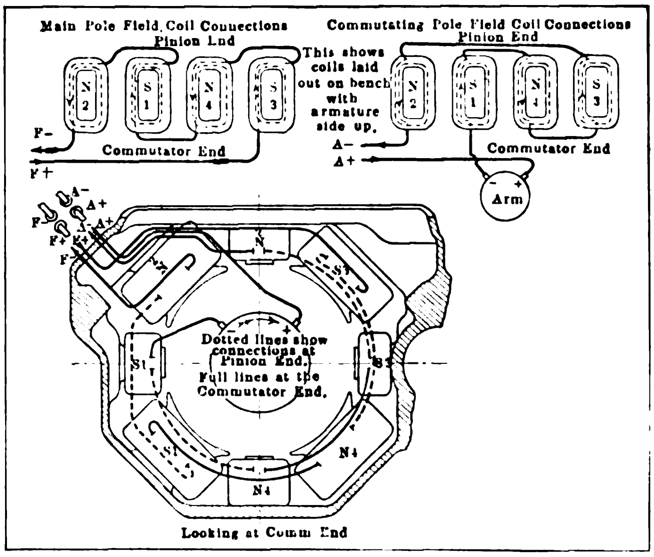


DIPPING AND BAKING CURVE SHOWING EFFECT ON ARMATURE FAILURES

Some one asked about the value of using air-drying varnish instead of dipping and baking. Mr. Dean replied that this was undoubtedly better than nothing, but not as good as the dipping and baking process. Yet he mentioned that he knew of one company that was dipping its armatures but not baking them, on the theory that they were baked on the road. One of the members interjected that the air-drying varnish would give so little penetration that it would result in only a surface treatment and would be of little value. Another man commented that the big problem in armature maintenance was the commutator leads, saying that the coils do not burn out except as the result of lightning. He thought one of the big problems was to get the leads thoroughly packed so that they will be held firmly in place and particularly well insulated.

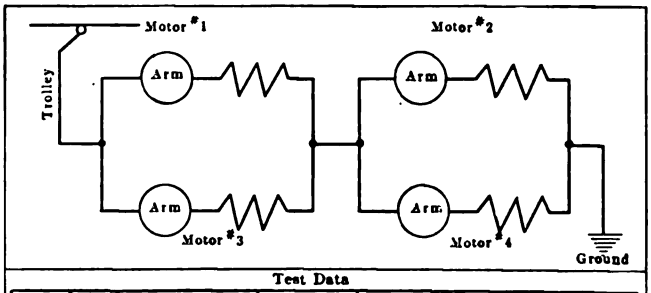
Mr. Dean spoke briefly of banding armatures and said that some companies do not band them, except perhaps for the core bands, until after the armatures have been dipped and baked. This probably permits more varnish to penetrate into the cambric and around the leads.

Endeavoring to answer the question of whether or not it pays to dip and bake armatures, Mr. Dean showed curves from two different companies. One of these showed a distinctly upward trend, since the process of dipping and baking had been started, of increasing life of armatures. The other curve was drawn up to show the number of armature failures, and this showed a decided drop.


Main Pole Field Coil Connections
Pinion End
Commutating Pole Field Coil Connections
Pinion End
This shows coils laid out on bench with armature side up.
N 2
S 1
N 4
S 3
N 2
S 1
N 4
S 3
F-
F+
Commutator End
A-
A+
Commutator End
Arm
A-
A+
F-
F+
N
S3
S1
S3
S1
N4
N4
Dotted lines show connections at Pinion End.
Full lines at the Commutator End.
Looking at Comm End

WIRING AROUND FRAME DIAGRAM—RAILWAY MOTOR

Speaking of the problem of securing correct armature winding, Mr. Dean said that the common practice of the armature winder was to take note of how the armature upon which he was working seemed to be wound, and then follow this in putting in a new coil. He said this was not always a safe thing to do and it sometimes led to a mistake. A damaged armature upon which he may be working may have been wound wrong before. To make the armature winder's work more certain, Mr. Dean showed some charts which the Westinghouse company has had prepared. These show in a simplified manner the method of laying off windings in different type motors. A separate chart has been drawn for each motor, and the armature and field instructions for the same motor are also separated.



Test Data

Test No.	Motors	Control Positions	Amperes per Motor				Line Amperes
			1	2	3	4	
1	All motors cut in	Full parallel	53	53	53	53	212
2	All motors cut in	Full series	96	48	0	48	96
	Brushes out of #3						
3	All motors cut in	Full parallel	64	64	0	64	192
	Brushes out of #3						
4	No.1 and No.3 cut out	Full series	0	80	0	80	160
	No.2 and No.4 cut out						

Conditions of Test

a - Test car special and no passenger load.
b - Ammeter was connected in series with car circuit breaker.
c - Rail clean and dry.
d - Trolley voltage high 575 to 585 volts.
e - All observations were taken on a grade at the same location for each test.

Remarks

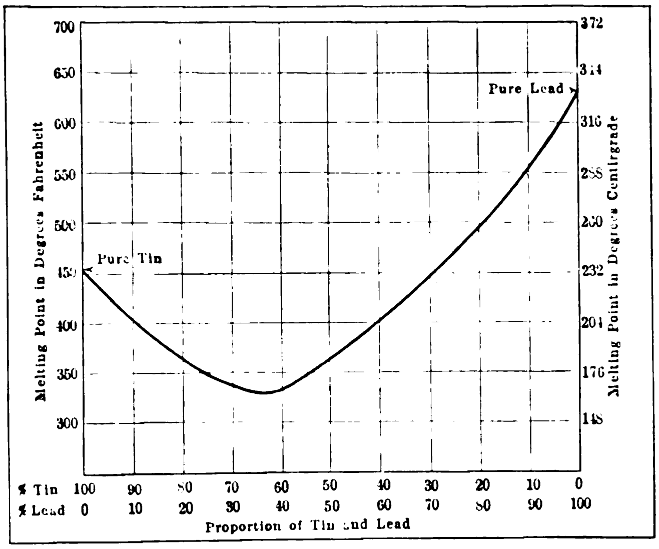
a - Commutation of motors sparkless.
b - Wheels did not slip.
c - Slightly increased noise.
d - Car speed during tests 2 and 3 about normal.
e - Motorman unable to tell whether one motor was cut out by operation of the car.

TEST DATA OF UNBALANCED MOTOR OPERATION

They have found it desirable to have separate charts for the fields and armatures because different men do work on these separate parts of the machine. A pair of these charts is illustrated herewith on pages 540 and 541.

Mr. Dean spoke of the fact that few companies test the fields of motors for polarity. He said a field coil may easily be connected up in the wrong way and that it is very difficult to find this out unless a test is made before putting the motor into service. While a wrong field connection will reduce the speed of a car, the motorman may not notice this readily. He said it is therefore desirable to subject all motors to a load test under low voltage and take note of the speed before putting the motor back in service.

One of the members asked what would be the result of reversing the interpole connections. Mr. Dean said until recently he would have said that under those conditions it would be impossible to operate a motor, for the interpole, wrongly connected, would increase the armature reaction instead of compensating for it and would so buck the fields that a flashover would result. However, recently in Seattle there was a good deal of trouble with motors overheating and it was discovered that the cause was reversed interpoles. The trouble here did not show up in any radical way, but simply produced overheating.



CURVE SHOWING MELTING POINT OF TIN LEAD SOLDER

A question came up as to the proper way to connect the motor circuits, whether the field should be connected to trolley and the armature to ground, or vice versa. Mr. Church, Pittsburgh Railways, said that they used to connect the armature to trolley and the fields to ground and had a good many armatures fail from lightning. They then reversed the connections and had less loss of armature but more trouble with the fields. He thought it was just a question of whether it was better to burn out armatures or field coils. He considered that it was easier to replace a field coil, and so the practice in Pittsburgh is now to connect the field to the trolley. He also thought that there was less likelihood of a flashover if the connection is from trolley to field, for this places less voltage across the armature.

Mr. Kelsay added that any external disturbance is likely to have less effect upon the motor if the connection is from trolley to field, for the field coil then acts as a choke and tends to cut down the flash. However, for any internal motor trouble it does not make any difference which way the connection is made.

COMPOSITION OF SOLDERING ALLOYS

At this point an interesting curve was pictured on the screen showing the effect on melting point of varying combinations of lead and tin to make soldering alloys. Mr. Dean pointed out that for purposes of soldering commutator leads a soldering metal containing 15 per cent lead and 85 per cent tin gives the best results. For soldering fields the best alloy is 60 per cent lead and 40 per cent tin. He cautioned against getting too high a percentage of tin, saying that its very high affinity for copper causes it to eat into the copper. For soldering armature bands he recommended the use of pure tin solder, saying that it would give a 10 to 15 per cent longer life than a lead solder.

Mr. Creelman said the Boston Elevated Railway had very good success in the use of pure tin for soldering commutator leads. He said the solder would eat away the soldering iron and caused a great deal of trouble in this respect, but once the leads were soldered, the melting point was so high that the solder never melted out in a flashover.

The subject of armature coils becoming loose under the bands was brought up and it was found that one company had overcome this trouble by eliminating the special insulation usually placed over the coils and underneath the bands. It seems that this insulation sometimes works out and leaves the coil loose. This company did away with the band insulation by putting a heavy enough insulation on the coil itself to protect it from the bands, which were then wound tight against the coils. Under this scheme no difficulty has been found in keeping the coils tight.

Mr. Dean then turned to the subject of babbitting bearings and presented some curves to show the results of bringing the babbitting metal to too high a temperature, of pouring it too cold or too hot, etc. He said that it is extremely important that the temperature of the metal be carefully controlled in order to get good results, and stated that the proper temperature for pouring is between 460 deg. and 480 deg. C. These figures apply to either a tin or lead base metal, except that the limitations of temperature are not so close on a tin base. He showed a picture of the automatic control of the temperature of the babbitting metal used in the Westinghouse Electric & Manufacturing Company's plant. A number of the members present commented that they were never able to get as long life out of bearings poured in their own shop as they did out of the original bearings which came from the manufacturers' plant, and it was concluded that this matter of proper control of temperature probably gave the explanation. Mr. Church of the Pittsburgh Railways said that the life of bearings had been doubled or perhaps tripled on his system through the installation of a temperature indicator, which simply kept the workman advised of the temperature though it did not control the temperature.

The discussion then turned to the method of oiling modern motors provided with oil wells. Mr. Dean urged the railway men to make sure that the oil was poured into the well to feed up through the waste from the bottom and not poured over the top of the waste. He said that it was only a waste of oil to pour it on the top and that this accounted for the oil-streaked streets and for oil getting inside the motors. Mr. Church, Pittsburgh, thought it was desirable to pour a little of the oil on top of the waste, for he had found that otherwise the bearings have a tendency to turn black, indicating that they are not getting quite enough oil. He was of the opinion that it is better to have a little excess and thereby be sure of enough. Mr. Creelman thought it was a good idea to put some oil on top of the waste, as it forms a kind of seal from the air, which causes a better rise of the oil up through the waste from the bottom of the well. Mr. Dean contended that too much oil was used as a rule and that oilers should be instructed to keep away from pouring any on top of the waste.

RELATION OF PRESSURE TO BRUSH WEAR

Taking up the subject of what is the proper brush pressure to use, Mr. Dean said that under ordinary practices 5 to 6 lb. per square inch is about right. Under bad track conditions, however, it is often found that 7 or 8 lb. is better. Where this had been recommended in a few cases, he said that the brush manufacturers had objected on the ground that it wore the brushes down too fast. He said he found that brush wear was more likely to be due to too little pressure than too much, for it comes more from burning than it does from friction. He remarked that it is a very good idea to give the brush-holders a very little light oil now and then, for particles of carbon worked into the joints and made them stiff and "screechy."

Mr. Dean then showed some interesting pictures of brushes which had been tested for side wear. He said that it had been practically impossible to determine the cause of this side wear, which is more or less trouble to nearly every property. The tests seemed to indicate practically the same wear whether the brushes were shunted or unshunted, and the grade of carbon, curiously enough, does not seem to make any difference either. He has observed, however, that the side wear seems to be more noticeable on ventilated motors than on the non-ventilated type and he has an idea that the dust and dirt drawn into the motor may have a good deal to do with the side wear of the brushes. He said that the Public Service Company of New Jersey had filled the ventilating ports of some of their motors with hair to catch the dirt and while they had cut down the brush wear they had also cut the rating of the motors, for samples of the hair sent to the Westinghouse factory showed that it became so thoroughly matted or clogged with dirt and dust that it stopped all ventilation. This concluded Mr. Dean's talk.

TROLLEY BASE TENSION DISCUSSED

The question was raised as to what tension is generally used on trolley bases on interurban service. The answers given showed that it varied from 30 to 36 lb. on the different properties represented. The pressure for city cars was said to be 25 lb. on the average.

W. H. Bloss, Ohio Brass Company, commented that he had observed that the companies which were using the lightest pressure were the ones that were buying the least overhead material. He commented also on the fact that the pressure used on many interurban cars is far too severe for city overhead construction. He said he was surprised that no one had said that the pressure he used was more than 36 lb., for he had found it to run 40, 50 and 60 lb. Where such cars come in over city tracks the high trolley pressure is hammering out all the overhead special work very rapidly. He said that this pointed to the desirability of using a type of base which would compensate for the height of the wire and not put unwarranted pressure on the low wire in order to make the trolley operate satisfactorily under high wire. The trolley bases which automatically increase the pressure as the angle to the roof increases and decrease the pressure as the angle decreases are desirable, for they take care of high wire at crossings and avoid overpressure on low wire.

Mr. Kelsey brought up the subject of using full bronze bearings instead of babbitted bearings. He said he is trying them out on account of the large number of bearing failures that have been occurring on his railway. The bearing housings are being redesigned so that the thickness of the bronze shell can be cut down. Later on if the shell gets loose the housing can be bored out and a larger size shell used. He spoke also of a recent scheme of using a bronze bearing without turning it. He referred to bearings manufactured by the American Crucible Products Company, which are so treated and cast that they are smooth enough outside to give a good fit in the housing and smooth enough inside so that they do not need to be turned for the bearing surface.

HOT BEARINGS RESULT FROM CARELESSNESS

E. M. Williams, chief engineer of this company, who was present, was called upon. He said that most hot bearings are the result of carelessness, that any bearing is all right as long as it is properly oiled, but the test of the bearing comes when oiling is neglected. He explained that with a babbitt-bearing metal if the temperature rises to 350 deg. the bearing is gone, while a bronze bearing such as made by his company will withstand a temperature of 1,200 deg. without melting. This metal had the further advantage that lubrication is provided in the metal, so that it contains considerable natural lubrication. Another interesting point made was that babbitt bearing tends to run hot before the bearing is run in the first time. The impregnation of graphite into the bronze metal, however, takes care of this initial wearing in. Mr. Kelsey showed a bronze bearing of this type which had run hot, causing a film of metal to melt out of the bearing, exposing a new surface of the natural lubrication in the bearing which permitted the car to continue its run, the heated bearing not showing up until the inspection at the end of the run.

Mr. Creelman, Youngstown, said that he had been able to get much better results from solid babbitt bearings than from the babbitt-filled shell-type bearings. He said the reason the railways never get as good life from bearings rebabbitted as they do from the original bearings received from the factory is that a perfect thermal weld between the babbitt and the cast-iron shell is not secured, and this leaves a slight space in between the two metals.

Some discussion followed on the value of automatic slack adjusters for brakes. All of the makes on the market came in for favorable comment when installed under proper condition, although it seemed to be the opinion that none of these is adaptable to all kinds of trucks. It was very clearly brought out that there is a great field for the slack adjuster, for it was stated that if one is installed which works properly it is possible to cut the inspection force in half and the period of inspection can be lengthened.

Maintenance of Portable Electric Drills

To Obtain the Best Performance and Longest Life from the Various Parts Regular Inspection and Repair Should Be Carried Out with the Same Thoroughness as with Other Electric Motors

BY E. L. CONNELL
Chief Engineer Van Dorn Electric Tool Company, Cleveland, Ohio

THE portable electric drill is essentially an electric motor, and it should be given the same protection and consideration as is usually given to such apparatus. The small sizes in common use are equipped with a universal motor which drives through the chuck and train of gears, so as to reduce the speed to from a fifth to a twenty-fifth of that of the armature. Electric power is ordinarily supplied through a flexible cable, and the motor is controlled by a switch conveniently located on the handle of the drill.

ARMATURE SHOULD BE GIVEN THE BEST POSSIBLE ATTENTION

The armature is the most delicate part of any motor, and this is the part that should be the first examined if the machine shows signs of distress. Often a motor is burned out through neglect promptly to repair trouble which develops in the armature. If severe sparking takes place between the brushes and commutator, the machine should be taken out of service at once and given a thorough inspection. The motors of electric drills are subject to the usual "diseases" of electric motors, which may be detected in the usual way. Grounds can be located with a magneto ringer, and if no ground is detected in the armature, the field, switch and cable connections should be tested. An open circuit in the armature will be shown by burning between the commutator bars, to which the open coil is connected. A short circuit within a coil will burn out the "shorted" turns and a "short" between commutator bars will overheat the bars so "shorted." A short circuit between commutator bars may sometimes be repaired if discovered before the coil is burned by removing the foreign substance between the bars, but an open or short-circuited coil requires a rewinding. If the armature is built with open slots and with form-wound coils, repairs can often be made economically by the average repair man with coils purchased from the manufacturer. If the armature is built with semi-closed slots, it will probably be best to return it to the maker for rewinding.

The brushes used in such motors are chosen by the manufacturers after exhaustive tests to obtain the best performance and longest life. It is, therefore, imperative that only such brushes as are approved by the maker of the machine be used. A brush made from any material which happens to be convenient may ruin the motor. Some of the effects produced from improper brushes are overheating from friction, sparking or high resistance. If the material used in the brush is too hard, the friction and wear on the commutator will be excessive, and if it is too soft, the mica may wear high between commutator bars and cause chattering and destructive sparkling. If the resistance of the brush is too low, there will be an excessive short-circuit current which will cause sparking and overheating of the commutator and armature coils, while if too high the normal current may overheat the brush and cause rapid wear.

It is best to examine the brushes before the expiration of 200 hours of actual running time, and it will be a help to clean the commutator with fine sandpaper several times during the life of the brush. The tension on the brushes should be uniform and just sufficient to prevent arcing on a smooth commutator. A tension of at least 4 lb. per square inch of brush contact is usually necessary. Should the commutator become rough, the armature should be removed and the commutator refinished by taking a very light cut in a lathe.

Fields are not apt to fail frequently, but they are occasionally burned out through the operation of the tool after the armature has become defective. A short-circuited field coil will cause overspeeding or flashing when the switch is closed. The best field coils have windings treated with an impregnating varnish, and this feature is considered extremely important by the manufacturers.

Grease-lubricated tools provide a maximum of cleanliness with a minimum amount of attention. It is considered good practice to replenish the grease supply as often as the tool is cleaned or inspected, which on account of brush wear should not exceed 200 hours of service.

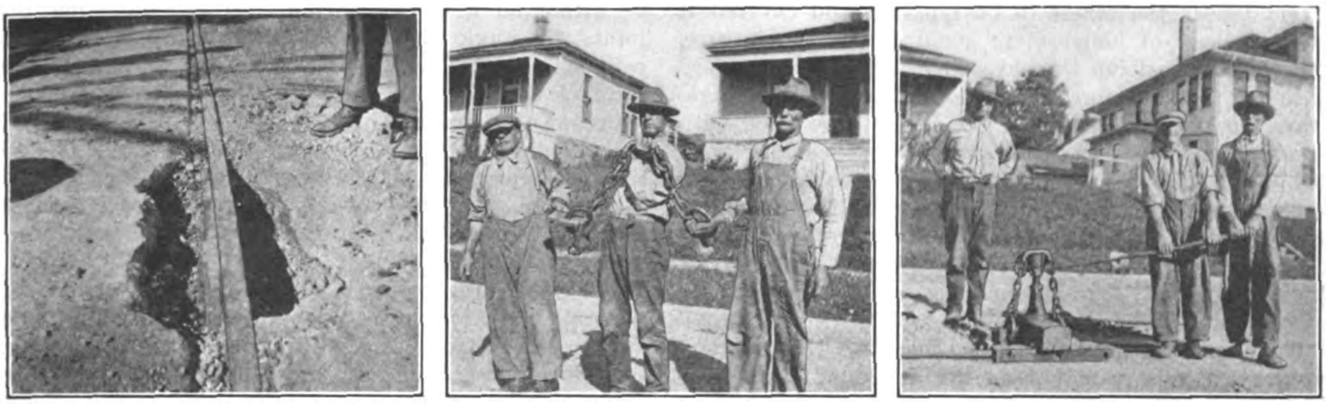
The cable connection is very often abused by using it to drag the tool around. Some cables are, of course, better than others, but all require reasonable consideration. When a tool is to be used in one position for long periods, the tool and cable should be suspended from above with a counterweight. The machine is then always accessible and free from cable abuse.

Sometimes, when used in drilling sheet metal, the lip of a drill will catch as it breaks through, thus stalling the machine. This trouble can be prevented by grinding the drill especially for this work. The angle of the point should be reduced to give a longer point, and the sharp angle at the cutting edge should be ground off slightly to give the same results as would a smaller angle of the spiral flute to the axis of the drill. The standard angle used is 59 deg. Proper grinding may also help to prevent "grabbing" in soft material and will allow high feed pressure without chipping the cutting edges in very hard material. For drilling in wood the type of drill necessary will depend upon the condition and kind of wood and depth of the hole. In the drilling of green wood the hole should be cleared several times if the depth of the hole is many times its diameter.

Repair Shop Like a Hospital

IN THE Feb. 26 issue of the *Electrical World* James Dixon likens a repair shop to a hospital. He says a winding room ought to be antiseptic and therefore should be entirely removed from all machine shop operations and shut off by a wall. A chip of metal in the insulation of a motor that is being repaired is like a germ in an open wound, sure to cause trouble later. The same idea applies with full force to commutator work.

Mr. Dixon carries the thought further by stating that in a hospital the patients who are cured are not left lying around in the operating room. So neither should repaired machines or parts be kept lying around the shops where other repair work is being done. A suitable storeroom, separate but accessible, with proper crane service, racks and protection from dirt, should always be provided for raw materials and finished work.



AT LEFT, OPENING IN CONCRETE PAVING MADE IN ORDER TO REPAIR JOINTS. IN CENTER, HEAVY CHAIN AND RAIL GRIPS USED IN LIFTING LOW JOINTS. AT RIGHT, CHAIN AND JACK ASSEMBLY IN POSITION TO LIFT RAILS

Concrete Paving Repair by Novel Method

Old Removed Asphalt Pavement Melted Up to Fill Holes—Cheap, Quick and Apparently Successful Method of Repair Made Possible Through Use of Waste Material

By R. C. MILLS
Vice-President Sioux Falls (S. D.) Traction System

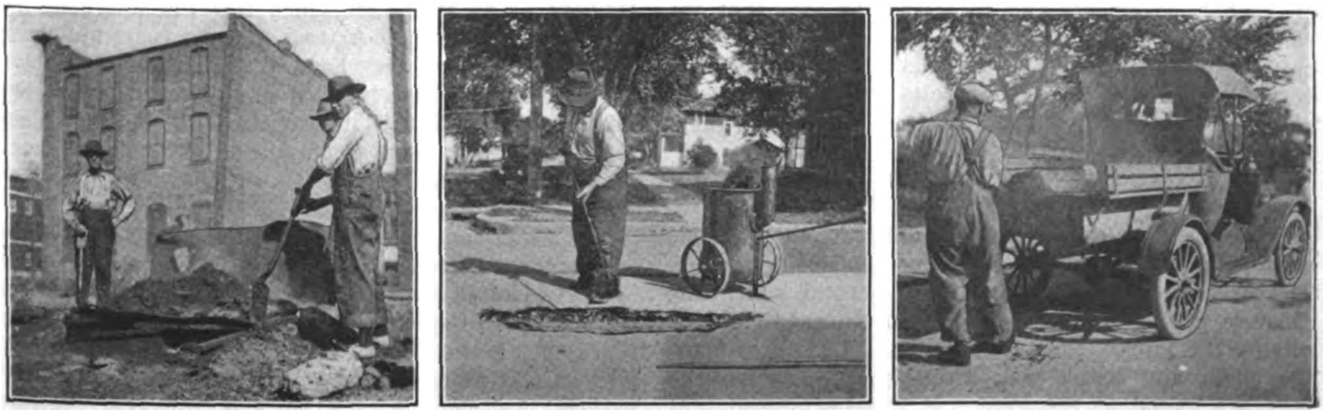
LAST summer we repaired five blocks of concrete paving between our tracks on the main business street of Sioux Falls, making use of a method which was rather inexpensive and apparently successful from the standpoint of both appearance and service.

This pavement, laid in 1914, was a mixture of sand, crushed granite rock and cement extending in a monolithic slab from the bottom of the ties to the top of the rail, a depth of 14 in. The track construction has remained solid and there has been no trouble from loose or working rails or joints, but the continual abrasion of the motor trucks and steel-tired vehicles had worn deep ruts along the flangeways and, in some places, along the sides of the track construction. Cup-shaped holes as large as a dishpan had been worn out at various points along the center of the track. The pavement was therefore in a very unsightly and dangerous condition for vehicular traffic, and as a result it was several times sarcastically referred to by one of our local papers as resembling the shell holes of the battle fields of Europe.

In 1919 we attempted to repair some of the worst places by trimming up the holes and relaying granite blocks grouted in with concrete. This was found to be a very laborious and expensive undertaking, particularly that part of the work involved in preparing the holes for laying the blocks. We first tried cutting out the old concrete with chisels and mauls, but could not hold men on the job and finally gave this method up. Later, air hammers with bull points were used to drill holes close together and down the depth of the blocks to be laid, breaking out the intervening concrete with bars and wedges. This method was also too slow and expensive and was given up, and the remainder of the street left in bad condition until last summer, when our other work was sufficiently well taken care of to permit of taking up the repair of this pavement.

OLD PILE OF ASPHALT BECOMES ASSET

Having a quantity of old asphaltic concrete pavement on hand which had been removed from our tracks in the residence district, we constructed a furnace in the



AT LEFT, HOW THE OLD ASPHALT PAVEMENT WAS MELTED UP. IN CENTER, PAINTING THE OPENING IN THE PAVEMENT WITH HOT TARVIA AS A BINDER BETWEEN THE ASPHALT AND CONCRETE. AT RIGHT, METHOD OF HAULING AND SPREADING THE ASPHALT TO FILL THE OPENINGS ground near the street to be repaired and covered it with a sheet of boiler plate about 7 x 10 ft. in size, on which to melt up the old asphalt. The process used in filling the holes in the pavement and along the flangeways was first to clean out the holes to be filled with a wire brush and then paint the whole surface with hot tarvia. Before this had a chance to cool the melted asphalt mixture was poured into the hole until it was slightly more than filled. Hot tampers were then used thoroughly to compact the mixture, and while still hot the surface was liberally sprinkled with a dry mixture of half sand and half cement.

The work of repairing the holes by this method progressed very rapidly and the entire job was completed within two working days. In making this kind of repair it is very essential that street sprinkling be discontinued for at least twenty-four hours before attempting to put in these patches, as the concrete must be absolutely dry, and the hotter the day the better the finished results. No attempt was made to protect the patches from traffic, which was permitted to pass over them as soon as laid, with no apparent damage.

AT LEFT, TAMPING THE ASPHALT SOLID INTO THE OPENING. CENTER AND RIGHT, A WORK CAR, EQUIPPED WITH SIDE OUTRIGGING TO DRAG PLOW, FACILITATES EXCAVATION FOR NEW TRACK

It may be that winter traffic and excessive cold may cause some failures in this repair work, but we are satisfied that we have a cheap and rapid method of repairing concrete pavement, and if some defects do appear in these patches within the next few months it will be a small matter to touch them up or make renewals.

Possibly this method of making repairs is not new to other roads, but we have never read of it. The credit for our job is due J. K. Gibson, our superintendent, who watched some repairs being made by the city on asphalt pavements and conceived the idea that the same method would work out in repairing holes in concrete. While we were at first skeptical, we are now very enthusiastic over the results obtained, and our pile of old broken-up asphalt becomes an asset in making future repairs.

PICTURES SHOW HOW WORK WAS DONE

Several accompanying pictures illustrate the methods used in making the rail joint and pavement repairs. The first view shows a low joint, around which the concrete paving has been broken out in readiness for raising the joint. The second and third pictures show the chain and screw jack assembly with which the rails are raised at the joint. It will be noticed that the chain and rail grips are very heavy, as they have to withstand a terrific strain. In rehabilitating the joints, the angle bars are of course removed from the rails before this lifting device is put in place. The rails are then hoisted to an elevation sufficient to place shims of the desired thickness on top of the ties. If the old angle bars are worn or defective in any way they are replaced with new ones, to insure a good tight smooth-running joint. We have used this method for several years and have always found it very satisfactory.

The succeeding pictures show our method of melting the asphalt, painting the opening with hot tarvia as a binder between the asphalt and the concrete, hauling, spreading and tamping the hot asphalt in place. There should have been one more picture showing the patch after it had been smoothed out with a hot paving iron and the finished surface sprinkled with a sifted mixture of half sand and half cement. After this is done, the surface is left as smooth as the rest of the pavement and the sand and cement soon work into the asphalt under the effect of traffic and leave the patch hardly discernible from the remainder of the pavement.

EFFECTIVE MEANS OF EXCAVATING TRACKWAY

The last two pictures show the method we used last summer for plowing up the roadway on both sides of a single track, preparatory to the installation of a diamond point passing switch. An extra heavy, well-ironed breaking plow was attached to a 10-in. x 10-in. timber which was fastened as a side outrigger on a work car. The position of the furrow with respect to the track was adjusted by sliding the heavy chain which pulled the plow back and forth on the outrigger timbers. The street on which this job was done had been covered with cinders two or three years previously which had become very hard and compact. I doubt if six horses could have handled this plow, and we accomplished more with this improvised outfit in three hours than could have been accomplished by sufficient teams in a day's time.

The American Engineering standards committee has been enlarged recently by the addition of representation from the United States Department of Agriculture, from United States Department of the Interior, from a group representing the American Gas Association, the Compressed Gas Manufacturers' Association and the International Acetylene Association and from the American Electric Railway Association.

Determining Forces in Brake Rigging*

With the Air Pressure in the Brake Cylinder or the Force Applied to the Handle of a Hand Brake as the Starting Point, the Author Shows How the Forces Which Are Developed in All Members of a Foundation Brake Rigging Are Computed

BY H. M. P. MURPHY

IN AN article published in the Feb. 19 issue of the ELECTRIC RAILWAY JOURNAL I gave the principles of operation and methods of calculating forces for the most common types of handbrakes used on electric cars. In this article the forces developed with air brakes will be considered and then the calculation will be followed through the various levers and rods constituting a foundation brake rigging to give the force acting on the brake beams at the wheels.

In computations of the forces developed in a foundation brake rigging of a car with air brakes, the initial force used is that exerted by the brake-cylinder push rod. This force depends on the air pressure in the cylinder and on the size of the piston. In dealing with brake-rigging problems it is customary to use certain standard air pressures. Those most commonly used are 50 and 60 lb. per square inch.

In order to provide a direct means for determining the total force exerted on the push rod of any standard cylinder, the accompanying table has been compiled and should prove of much value in this connection. In exceptional cases, where the use of the table is not possible, the desired total push-rod force may be computed directly in the following manner:

TABLE OF BRAKE-RIGGING DATA

Diameters of Brake Cylinders and Areas of Pistons

Diam. in Inches..	6	8	10	12	14	16	18
Area in sq.in.....	28.274	50.265	78.540	113.10	153.94	201.06	254.47

Total Forces in Pounds on Cylinder Push Rods

Cyl. Pres. Lb. per Sq.In.	Diameters of Cylinders in Inches 6	8	10	12	14	16	18
50	1,414	2,513	3,927	5,655	7,697	10,053	12,724
55	1,555	2,765	4,320	6,221	8,467	11,058	13,996
60	1,696	3,016	4,712	6,786	9,236	12,064	15,268
65	1,838	3,267	5,105	7,352	10,006	13,069	16,541
70	1,979	3,519	5,498	7,917	10,776	14,074	17,813
75	2,121	3,770	5,891	8,483	11,546	15,080	19,085
80	2,262	4,021	6,283	9,048	12,315	16,085	20,358
85	2,403	4,273	6,676	9,614	13,085	17,090	21,630
90	2,545	4,524	7,069	10,179	13,855	18,095	22,902
95	2,686	4,775	7,461	10,745	14,624	19,101	24,175
100	2,827	5,027	7,854	11,310	15,394	20,106	25,447
105	2,969	5,278	8,247	11,876	16,164	21,111	26,719
110	3,110	5,529	8,639	12,441	16,933	22,117	27,992

To find the total force exerted on any brake-cylinder push rod, multiply the decimal fraction 0.7854 by the square of the inside diameter of the brake cylinder (in inches) and multiply this product by the specified cylinder air pressure (in pounds per square inch). The "square of the diameter" means, of course, the product obtained by multiplying the diameter by itself. As an example of this method, let it be required to find the force exerted by the push rod of a 10-in. brake cylinder when the cylinder air pressure is 50 lb. per square inch. To solve this problem, first find the square of the diameter of the cylinder, which is 10 × 10 = 100, then multiply the decimal fraction 0.7854 by this number (*i.e.*, 100); this gives 78.54. Finally multiply this last quantity by the cylinder air pressure of 50 lb. per square inch, thus, 78.54 × 50 = 3,927 lb., which is the desired force.

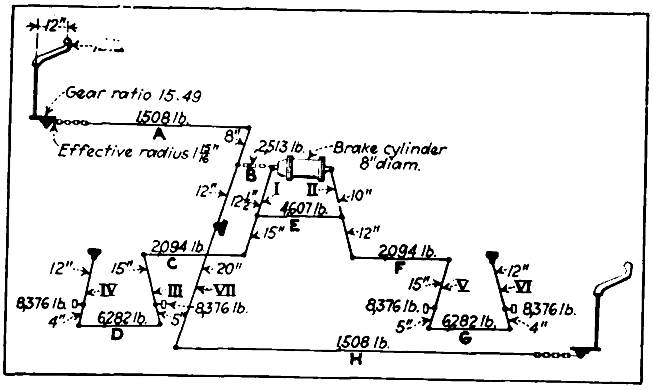


FIG. 1—BRAKE LEVERAGE DIAGRAM FOR DOUBLE-TRUCK CAR WITH INSIDE-HUNG BRAKESHOES

In order to give a clear idea of the general arrangement of the several parts, and of the methods of connecting the levers, etc., of standard forms of air-brake riggings, Figs. 1 to 3 have been prepared, and will be analyzed carefully in the following examples, which also serve to illustrate a few of the practical uses of the "Leverage Rule" given in the first of this series.

It is important to note here that, in the examples about to be given as well as in all subsequent problems, the "upper" and "lower" end points of levers referred to simply indicate the relative location of these points in the figures concerned and have no reference whatever to their actual location when the rigging is installed on cars or locomotives.

AIR-BRAKE RIGGINGS AND EXAMPLES

Let us first consider a brake rigging of the type illustrated in Fig. 1. This is a common form of electric car brake rigging with inside-hung brakeshoes. Let it be required to find the forces delivered to each of the four brake beams, when an 8-in. diameter brake cylinder and an air pressure of 50 lb. per square inch are employed, the dimensions of the various levers being those indicated in the diagram.

To solve this problem, it is first necessary to know the total force exerted by the cylinder push rod. This may be calculated or it may be found more easily by aid of the table, which gives the desired value as 2,513 lb. That is, a force of 2,513 lb. acts on the upper end of the cylinder live lever I. Now to find the forces delivered to the brake beams of the left-hand truck, it is obvious that the force on the tie rod *C* must first be found. This may, of course, be accomplished by aid of the "Leverage Rule." Thus, consider the middle point of lever I as the fulcrum, then

$$\text{Desired force} = \frac{(\text{Known force}) \times (\text{Lever arm of known force})}{\text{Lever arm of desired force}}$$

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*This is the third of a series of articles on forces developed in the brake rigging. Others appeared in the Jan. 15 and Feb. 19 issues of this paper.

Force on rod C =

$$\frac{(\text{Force on push rod}) \times (\text{Lever arm of force on push rod})}{\text{Lever arm of force on rod } C}$$

$$\text{Force on rod } C = \frac{2{,}513 \times 12\tfrac{1}{2}}{15} = 2{,}094 \text{ lb.}$$

To find the force exerted on the brake beam attached to the truck live lever III, it is necessary merely to consider the lower end point of this lever as the fulcrum and again to apply the "Leverage Rule," thus:

Force on brake beam of lever III =

$$\frac{2{,}094 \times 20}{5} = 8{,}376 \text{ lb.}$$

Also, to find the force exerted on the brake beam attached to the truck dead lever IV, the force on rod D must be found. This may be done by aid of the "Leverage Rule" by considering the middle point of lever III as the fulcrum; thus:

$$\text{Force on rod } D = \frac{2{,}094 \times 15}{5} = 6{,}282 \text{ lb.,}$$

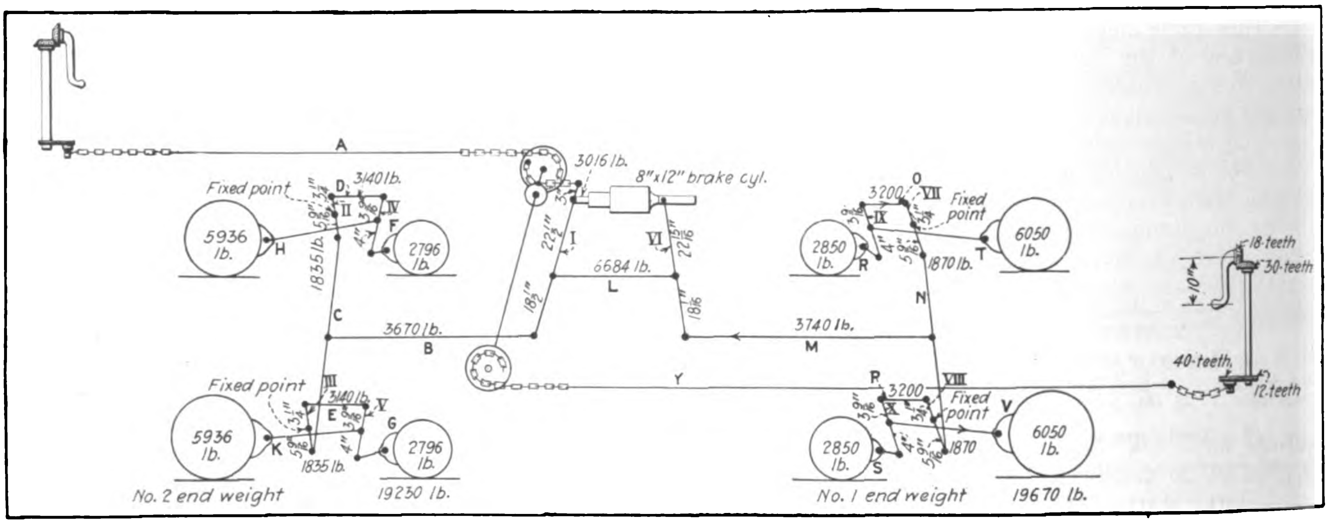


FIG. 2. BRAKE LEVERAGE DIAGRAM FOR CAR WITH MAXIMUM TRACTION TRUCKS

or the force exerted on rod D could have been found from the fact that either end force is equal to the middle force minus the other end force. Applying this principle we have:

Force on rod D = (Force on brake beam of lever III) — (Force on rod C) = 8,376 — 2,094 = 6,282 lb.

Of course, these methods are equally accurate, and the latter is much the easier one to use, but usually it is well to employ both and thus check the computations. With the force on rod D found, in order to find the force delivered to the brake beam attached to lever IV it is necessary only to consider the upper end point of the truck dead lever IV as the fulcrum and to apply the "Leverage Rule," thus:

Force on brake beam of lever IV =

$$\frac{6{,}282 \times 16}{12} = 8{,}376 \text{ lb.}$$

Now to find the forces delivered to the brake beams of the right-hand truck, the force exerted on the tie rod E must first be found. This may be done by considering the lower point of the cylinder live lever I as the fulcrum and applying the "Leverage Rule," as follows:

$$\text{Force on rod } E = \frac{2{,}513 \times 27\tfrac{1}{2}}{15} = 4{,}607 \text{ lb.,}$$

or the force exerted on rod E could have been found from the fact that the middle force is always equal to the sum of the two end forces, consequently we can obtain this value from,

Force on rod E = (Force on rod C) + (Force on push rod) = 2,094 + 2,513 = 4,607 lb.

Also to find the force exerted on rod F, consider the upper end point of the cylinder dead lever II as the fulcrum, whence,

$$\text{Force on rod } F = \frac{4{,}607 \times 10}{22} = 2{,}094 \text{ lb.}$$

Then to find the force delivered to the brake beam of the truck live lever V, consider the lower end point of lever V as the fulcrum and apply the "Leverage Rule," thus:

Force on brake beam of lever V =

$$\frac{2{,}094 \times 20}{5} = 8{,}376 \text{ lb.}$$

Next to find the force acting on rod G, consider the middle point of lever V as the fulcrum, whence:

$$\text{Force on rod } G = \frac{2{,}094 \times 15}{5} = 6{,}282 \text{ lb.}$$

or

Force on rod G = (Force on brake beam) — (Force on rod F) = 8,376 — 2,094 = 6,282 lb.

Also to find the force on the brake beam of the truck dead lever VI, consider the upper end point of lever VI as the fulcrum, whence:

Force on brake beam of lever VI =

$$\frac{6{,}282 \times 16}{12} = 8{,}376 \text{ lb.}$$

This completes the solution of the problem, the forces delivered to the four brake beams having been found. It should now be observed that all of these forces are equal (8,376 lb.), as they should be when the weight of the car is evenly distributed on the eight wheels. It will, moreover, be noted that in the course of the preceding solution the values of the forces acting on levers I, III and V were checked by a double calculation. If it is also desired to check the values of the forces acting on levers II, IV and VI and at the same time to find the forces exerted on the fixed centers of these levers, it is merely necessary to apply the "Leverage

Rule" to determine the unknown force in each case and to see that the sum of the two end forces is always equal to the middle force; thus, to check the values of the forces acting on lever VI, consider the middle point of lever VI as the fulcrum, then:

$$\text{Force at fixed end} = \frac{6{,}282 \times 4}{12} = 2{,}904 \text{ lb.}$$

And to check the values of the three forces acting on lever VI,

$$\text{Force on brake beam} = (\text{Force on rod } G) + (\text{Force at fixed end})$$

or

$$8{,}376 = 6{,}282 + 2{,}094$$

It should now be observed that in order completely to solve the foregoing example, or any other problem in which it is desired to find the forces delivered to the brake beams connected with a leverage system, the first step is to ascertain the size of the brake cylinder and the air pressure on which the calculations are to be based. Second, the total force acting on the cylinder push rod should be computed or obtained directly from the table. One of the forces acting on the cylinder lever having been thus determined, it is then necessary to follow through the system first to one truck and then to the other, computing the unknown forces developed at the various points of the levers by aid of the "Leverage Rule" and checking the values thus found when this is considered desirable. It should also be noted that, in order to determine the forces acting on any specified lever, one of these forces must always be given or ascertained from the previous calculations or data on the problem, then either one of the two remaining forces can be found by aid of the "Leverage Rule." It is merely necessary to note the point of application of the known force and the point of application of the desired force and to consider the third point (or pin center) as the fulcrum.

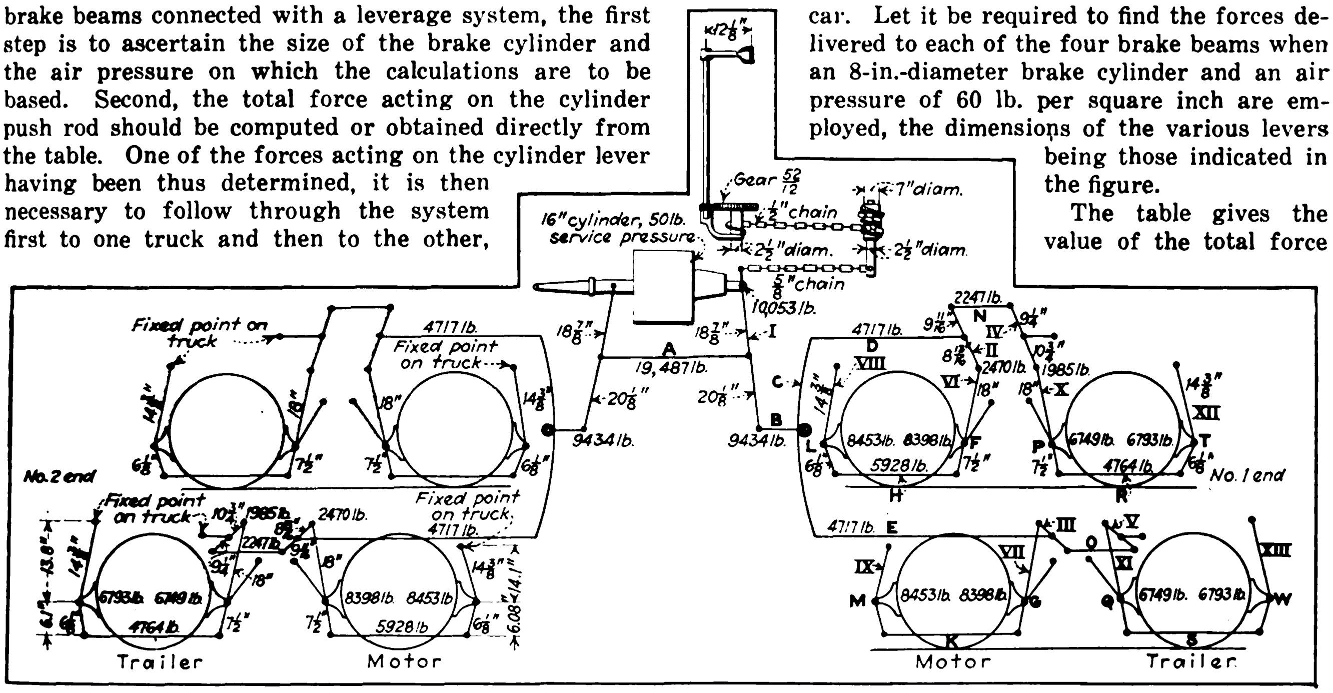

12⅛"
Gear 52/12
½" chain
7" diam.
16" cylinder, 50 lb. service pressure
2½" diam.
2½" diam.
⅝" chain
10,053 lb.
Fixed point on truck
4717 lb.
Fixed point on truck
18⅞"
A
19,487 lb.
18⅞"
I
20⅛"
20⅛"
9434 lb.
9434 lb.
B
C
14⅜"
18"
18"
14⅜"
7½"
7½"
6⅛"
6⅛"
No. 2 end
Fixed point on truck
10¾"
1985 lb.
2470 lb.
8¹³⁄₁₆"
2247 lb.
9¼"
9¼"
18"
18"
Fixed point on truck
4717 lb.
13.8"
14⅜"
14⅜"
14.1"
6.1"
6.08"
6793 lb.
6749 lb.
4764 lb.
8398 lb.
8453 lb.
5928 lb.
Trailer
Motor
2247 lb.
N
9¹¹⁄₁₆"
9¼"
4717 lb.
IV
D
II
10¾"
VIII
8¹³⁄₁₆"
2470 lb.
1985 lb.
VI
18"
18"
X
14⅜"
XII
L
8453 lb.
8398 lb.
F
P
6749 lb.
6793 lb.
T
6⅛"
5928 lb.
7½"
7½"
4764 lb.
6⅛"
No. 1 end
H
R
4717 lb.
E
III
V
O
VII
IX
XI
XIII
M
8453 lb.
8398 lb.
G
Q
6749 lb.
6793 lb.
W
K
S
Motor
Trailer

FIG. 3. BRAKE LEVERAGE DIAGRAM FOR CAR WITH CLASP BRAKES

Another fact of great importance, which has been previously emphasized and which is clearly demonstrated in the solution of this problem, is that the term "fulcrum" simply indicates the point about which a lever is considered to turn and, as during an application of the brakes each pin of a lever always rotates somewhat in its hole, any one of the three pin centers or lever points may be treated as the fulcrum with an equal degree of accuracy whether there is a fixed point or not.

In the additional examples, which will be given to illustrate the practical applications of the "Leverage Rule," the facts outlined in the preceding paragraphs will be assumed as being thoroughly understood, and, therefore, the solutions will not be so fully detailed as in this case. Especial attention should be called to the fact that when the "Leverage Rule" is used, only the numerical values of the known force and of the lever arms of the known and desired forces will be employed. No confusion can result if the sketches referred to are consulted and the known and desired forces are kept clearly in mind.

ADDITIONAL EXAMPLES SOLVED

Consider the brake rigging illustrated in Fig. 2. This form is used on center-entrance cars with a center loading well and maximum-traction trucks. The use of sheaves for connecting the hand brake rigging is necessary here in order to clear the well of the car. Let it be required to find the forces delivered to each of the four brake beams when an 8-in.-diameter brake cylinder and an air pressure of 60 lb. per square inch are employed, the dimensions of the various levers being those indicated in the figure.

The table gives the value of the total force acting on the cylinder push rods as 3,016 lb. Then by applying the leverage rule and considering the middle point of the cylinder live lever I as the fulcrum:

$$\text{Force on rod } B = \frac{3{,}016 \times 22\tfrac{1}{2}}{18\tfrac{1}{2}} = 3{,}670 \text{ lb.}$$

As tie rod *B* is connected to the radius bar *C* at its center, the two end forces acting on the lower ends of levers II and III will be one-half that in rod *B* or 1,835 lb. Considering the middle point of the lever II as the fulcrum,

$$\text{Force in rod } D = \frac{1{,}835 \times 5\tfrac{9}{16}}{3\tfrac{1}{4}} = 3{,}140 \text{ lb.}$$

To find the force on the brakeshoe *F*, consider the middle point of lever IV as the fulcrum. Then

$$\text{Force on shoe } F = \frac{3{,}140 \times 3\tfrac{9}{16}}{4} = 2{,}796 \text{ lb.}$$

Now as the two end forces acting on lever IV are known and as its middle point is connected directly to brakeshoe *H* through a tie rod it follows that

$$\text{Force on shoe } H = 3{,}140 + 2{,}796 = 5{,}936 \text{ lb.}$$

To find the forces delivered to the brakeshoes on the lower wheels of this truck it is necessary merely to consider the middle point of lever III as the fulcrum and then to compute the value of the force acting on rod *E*, which is 3,140 lb., and with the middle point of lever *V* as a fulcrum the force acting on the brakeshoe *G* is found to be 2,796 lb. By adding these values together we find the pressure on shoe *K* as 5,936 lb. Thus the pressure on shoe *F* is seen to be the same as that on shoe *G* and that on shoe *H* is the same as that on shoe *K*.

To find the forces delivered to the brake of the right-hand truck, consider the lower end of the cylinder live lever *I* as the fulcrum. Then

$$\text{Force in rod } L = \frac{3{,}016 \times 41}{18\frac{1}{2}} = 6{,}684 \text{ lb.,}$$

and with upper end of cylinder dead lever *VI* as a fulcrum,

$$\text{Force in rod } M = \frac{6{,}684 \times 22\frac{15}{16}}{41} = 3{,}740 \text{ lb.}$$

The force at each end of the radius bar *N* will then be one-half of 3,740 lb. or 1,870 lb., and

$$\text{Force in rods } O \text{ and } P = \frac{1{,}870 \times 5\frac{9}{16}}{3\frac{1}{4}} = 3{,}200 \text{ lb.}$$

From this we obtain:

$$\text{Force at shoes } R \text{ and } S = \frac{3{,}200 \times 3\frac{9}{16}}{4} = 2{,}850 \text{ lb.}$$

and

$$\text{Force at shoes } T \text{ and } V = 3{,}200 + 2{,}850 = 6{,}050 \text{ lb.}$$

By comparing the corresponding shoe pressures for the two trucks it is seen that they are not the same, those for the right-hand or No. 1 truck being greater. This was found desirable for this car as the car weight for No. 1 end was 440 lb. greater than that for No. 2 end. The reasons for having different shoe pressures for wheels with different weight pressures on the rails will be taken up in another article to appear later under the heading "Percentage of Braking Power."

FORCES IN RIGGING WITH CLASP BRAKES

As an additional example consider the brake rigging illustrated in Fig. 3. This is a common form of "clasp brake" used on heavy electric passenger cars having four-wheel trucks. By "clasp brake" is meant that type of brake in which each wheel is provided with two brakeshoes on opposite sides. Let it be required to find the force delivered to each of the eight brake beams when a 16-in. diameter cylinder and an air pressure of 50 lb. per square inch are employed.

The table gives the total force acting on the push rod as 10,053 lb., then by applying the "Leverage Rule" and considering the middle point of the cylinder live lever *I* as the fulcrum

$$\text{Force on rod } B = \frac{10{,}053 \times 18\frac{7}{8}}{20\frac{1}{8}} = 9{,}434 \text{ lb.}$$

This force in rod *B* acts on the radius bar *C* of the right-hand truck and the force at each end of this radius bar is one-half that in rod *B* or 4,717 lb. and acts on the rods *D* and *E*.

By considering the upper end of lever *II* as the fulcrum, then,

$$\text{Force at lower end of lever } II = \frac{4{,}717 \times 9\frac{11}{16}}{18\frac{1}{2}} = 2{,}470 \text{lb.}$$

and the force at the brakeshoe *F* is obtained by considering the lower end of lever *VI* as the fulcrum. That is

$$\text{Force at brakeshoe } F = \frac{2{,}470 \times 25\frac{1}{2}}{7\frac{1}{2}} = 8{,}398 \text{ lb.}$$

and

$$\text{Force in rod } H = 8{,}398 - 2{,}470 = 5{,}928 \text{ lb.}$$

The force at the brakeshoe *L* can then be obtained by considering the upper end of lever *VIII* as the fulcrum. That is

$$\text{Force at brakeshoe } L = \frac{5{,}928 \times 20\frac{1}{2}}{14\frac{3}{8}} = 8{,}453 \text{ lb.}$$

Next let us return to the top truck live lever *II*. The force acting at the upper end of this lever and in the tie rod *N* can be found as 4,717 — 2,470 = 2,247 lb., and

$$\text{Force at lower end of lever } IV = \frac{2{,}247 \times 9\frac{1}{2}}{10\frac{3}{4}} = 1{,}985 \text{ lb.}$$

$$\text{Force at brakeshoe } P = \frac{1{,}985 \times 25\frac{1}{2}}{7\frac{1}{2}} = 6{,}749 \text{ lb.}$$

$$\text{Force in rod } R = 6{,}749 - 1{,}985 = 4{,}764 \text{ lb.}$$

$$\text{Force at brakeshoe } T = \frac{4{,}764 \times 20\frac{1}{2}}{14\frac{3}{8}} = 6{,}793 \text{ lb.}$$

Similarly the shoe pressure for the lower pair of wheels of this truck and for the left-hand truck can be calculated. The dimensions of similarly located levers are the same in all cases so that corresponding pressures will be the same.

It should be noted that the shoe pressure on the trailer wheels is less than on the motor or driver wheels. The reason for this will be fully explained in a following article in which the subject of braking power will be discussed.

The three examples given cover the most common types of electric car brakes. A careful solution of these will give familiarity with the leverage rule and also show that the use of this rule is absolutely unlimited in its scope regardless of the design of the rigging, providing that the three forces acting on the levers concerned are parallel to each other.

New Auto Emergency Truck in Los Angeles

A NEW auto emergency truck with a telescoping tower and a full equipment for handling accidents and traffic blockades has just been put in operation by the Los Angeles (Cal.) Railway. This railway uses several of this type of emergency auto trucks, but the new one is the fastest and most fully equipped of any they have in use.

NEW AUTO EMERGENCY TRUCK

The truck carries a dolly for removing autos which break down on the car tracks and block traffic and also such equipment as hose bridges used at fires, tow lines, fire extinguishers and other complete apparatus for emergency electric car repair. The truck chassis was purchased and the body, tower and much of the equipment were made in the railway company's shops. The truck is of 2-ton capacity.

Cleaning Trucks for Overhaul

Large Lye Vat, Into Which Whole Truck Frames Are Immersed, Makes Repair Work Quicker and More Thorough—It Has Proved Itself Such a Valuable Aid that It Has Paid for the Initial Cost Several Times Over—Workmen Like It, as It Makes Their Work Easier and Cleaner

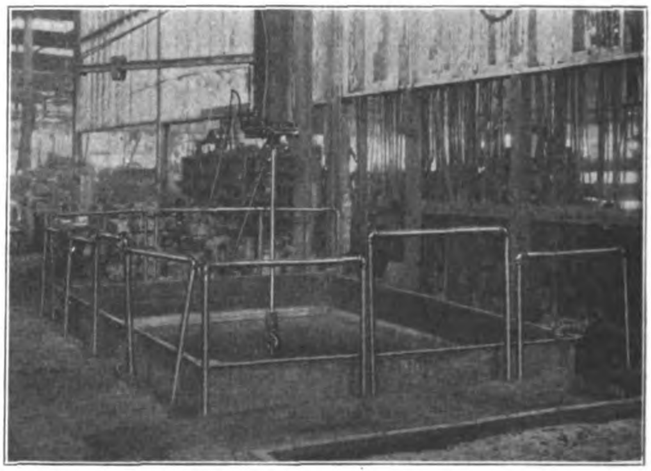
By HENRY S. DAY
Equipment Engineer Kansas City (Mo.) Railways

THE idea of cleaning dirty and greasy metal by means of hot lye is not new, but the application of the idea on a large scale has generally been confined to locomotive repair shops on steam roads. Small tanks for cleaning small parts are generally part of the equipment of the average electric railway shop, but what follows has to do with a tank of sufficient capacity to dip a complete truck. This tank has now been in use for about a year and has proved such a valuable aid in the overhauling of trucks that it is believed the details will be interesting to other railway men.

The equipment comprises a watertight steel tank in which the solution is heated by a steam coil, a crane or hoist for moving the trucks and other equipment into and out of the vat, and a basin where the parts can be thoroughly rinsed with clean water in order to remove all lye.

The tank is made of sheet steel $\frac{3}{16}$ in. thick, 14 ft. long, 10 ft. wide and 6 ft. deep and is installed at one side and close to the tracks on which trucks are stripped down for overhauling. The tank is set down in a concrete pit and blocked up on the floor of the pit so that the bottom of the tank pitches toward one corner and with the top of the tank extending 18 in. above the shop floor. At the low corner connection is made to a sewer through a 4-in. pipe fitted with a gate valve. This pipe is given considerable drop to aid drainage when the tank is being cleaned.

The contents of the tank are steam heated, and for this purpose 280 ft. of 2-in. iron pipe resting on steel cradles laid flat on the bottom was installed. By the use of a number of these cradles, the pipe is sufficiently trussed so that whatever equipment is being cleaned can be let down to rest on the pipes without injuring them. The distance from the bottom of the tank to the top of the pipes is 18 in., which furnishes an ample sediment cellar. The coil in the tank is connected to the boiler, which supplies steam at about 60 lb. pressure, keeping the solution in the vat between 150 and 200 deg. F., which has been found hot enough. At times steam will be given off at the surface, but not in sufficient quantity to bother the workmen in the immediate vicinity or to make it necessary to install a ventilator in the roof over the vat.

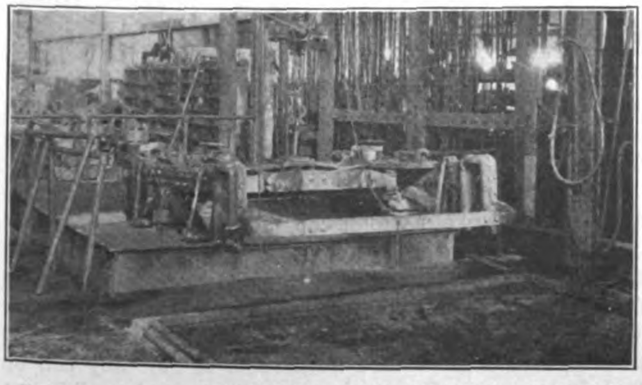


LYE VAT IN KANSAS CITY RAILWAY SHOPS SHOWING AIR HOIST, AND GUARD RAIL SECTIONS IN PLACE

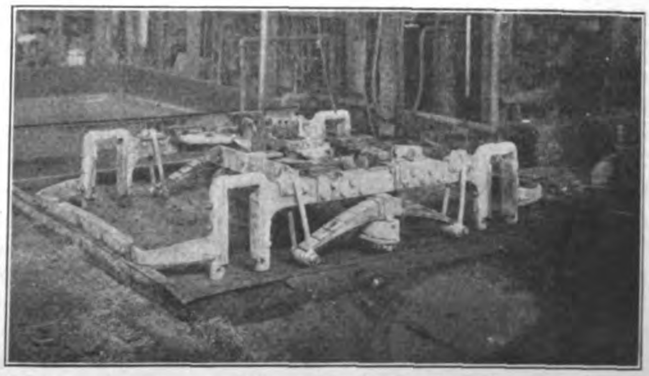
The tank holds 45,000 lb. of water, and about 450 lb. of flake caustic gives a 10 per cent solution, which has been found strong enough to clean the average truck in from one to one and one-half hours. In our particular case, this was found to be fast enough, but of course a stronger solution would work faster if this were necessary.

Flake caustic is used in preference to the powdered form because there is no objectionable dust when charging the tank and the cost is about the same.

It was of course necessary to guard against persons falling into the lye, and as a fixed rail would be more or less in the way of the operatives, the guard rail was made of a number of "U" shaped sections of pipe



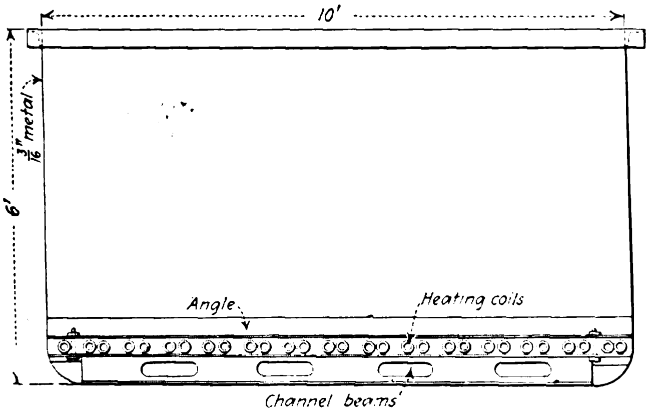
TRUCK LIFTED OUT OF VAT AND PLACED ON BASIN READY FOR RINSING OFF THE LYE



GUARD RAILS REMOVED TO PERMIT READY HANDLING OF TRUCK TO RINSE BASIN SEEN AT THE RIGHT which are set into pipe sockets in the cement retaining wall. This method gave thorough protection around the edge and at the same time made it easy and quick to remove one or more sections when in the way. The projection of the steel tank 18 in. above the floor level also gave further protection and did not add any interference in lifting heavy bodies out of the solution.

The rinsing stand was installed adjacent to the vat. This consisted of a cement basin 9 ft. x 9 ft., built with the center 8 in. below the edges and connected to an 8-in. drain pipe, the opening into the drain being covered with a steel perforated strainer.

Both the vat and rinse stand are served with a 5-ton crane having an 18 ft. boom equipped with an air hoist. On account of lack of space under the traveling crane serving the truck shop it was necessary to install the lye vat to one side, and it was feared at the start that considerable time would be lost transferring truck frames and other heavy bodies from the traveling crane to the small jib crane, but this has not proved the case.



CROSS-SECTION OF TANK SHOWING SUPPORTS FOR HEATING COILS IN THE BOTTOM

Trucks due for overhaul are run in on the repair track, which is next to the vat. After the gear pans and motors are removed, the frames are lifted from the wheels by the traveling crane and dropped within reach of the lye vat crane. Without the making of any attempt to remove any dirt, grease or oil, the whole frame is lowered into the lye and allowed to remain from one to two hours. It is then transferred to the rinse stand and washed off with a hose. During the stay in the vat the metal becomes the same temperature as the water and is hot enough, when it comes out, to dry off the rinse water, so that the truck frame is turned over to the repair man with steel clean and perfectly dry.

Immediately after a truck is received from the rinse stand, an inspector examines it and quickly and easily finds small cracks or fractures that have just started which would probably have been missed had the truck not been washed. These he marks with chalk and a portable welding outfit follows him and makes repairs. Loose bolts and rivets are also much more easily found. It is at this point that a very considerable saving in time takes place in the reassembly and in making repairs. Repairmen looking for worn or loose parts find them quickly, and wrenches stay where they are placed without slipping off. Parts sent to the machine shop are ready to work on without first scraping or cleaning away oil and dirt.

By actual comparison it has been found that a truck that has been through the lye vat is assembled in from 10 to 15 per cent less time than one that has not. Before the lye vat was installed it was the method, after a truck was overhauled, to have one workman with a scraper and stiff brush clean the truck and then paint it. This required about one day's time and a gallon to a gallon and a half of paint, for the dirt that could not be removed soaked up most of the paint. With the cleaned truck, 2 quarts of paint cover the truck liberally, and by applying with a small hand air sprayer fifteen minutes is ample time and the truck is thoroughly and evenly painted.

Since the installation of the lye vat in January, 1920, some 700 or 800 trucks have been washed, besides many thousand smaller parts, such as motor frames, housings, journal boxes, air compressors, etc. Air compressors and parts of like weight are let down into the solution by the hoist and secured to the edge of the tank or pipe rail by a locating chain. Smaller parts are placed in steel baskets. All dirty scrap brass and copper is also washed, eventually saving much time in sorting and grading.

The vat is operated by one laborer, who devotes most of his time to its operation, but when not so occupied he is used on the truck floor.

As a rule, the truck floor in most shops is the dirtiest place in the shop, but with a lye vat this is not so. Most of the dirt and grease goes into the vat and there are practically no slop and no fumes at all. A certain amount of evaporation takes place, but the addition of water keeps the solution at the desired level. This particular vat was operated from January to June without replenishing the caustic and the tank has been cleaned out only twice in one year. This was done by opening the gate valve, allowing the solution to run into the sewer and running clear water through the tank until all sediment had disappeared.

A feature that has been of no little value is that the workmen like it as it makes their work easier and cleaner, and there has never been any of the criticism that generally goes with equipment which is admittedly installed to speed up production.

There are, of course, a number of ways of building a tank of this kind and the writer has had experience with a vat that was merely a cement basin let into the floor, but believes the steel tank is better. It is also desirable, if possible, to place the tank under the same crane that serves the truck floor, but as already stated the present installation could not be arranged in that manner, though it is giving excellent results and has already paid for the initial cost several times over.

Adjustable Winding Machine

THE Comstock Manufacturing Company, Wilkes-Barre, Pa., is placing on the market an adjustable head winding machine having three speeds. It is driven through a cone friction clutch and worm gear and is controlled with a foot lever. Either right or left-hand winding can be taken care of, as the machine has a face plate on each end of the shaft.

Another product of the company is an adjustable armature coil press which can be used for either hot or cold coil pressing. Either gas or steam heat can be used for hot pressing and the coil is pressed with one movement of a cam lever. The amount of pressure secured can be adjusted by nuts on hook bolts. The platens on the press are adjustable to suit any coil up to $\frac{3}{4}$ in. square. Extra platens are used when different lengths of coils are to be pressed.

Equipment and Its Maintenance

Short Descriptions of Tools Used Together with Mechanical and Electrical Practices of All Departments to Supplement the Preceding Longer Articles

Steel Trolley Shortens Trolley Wheel Life

Experience of the Louisville (Ky.) Railway with 9,400 Ft. of Steel Wire Which Was Installed in the Fall of 1913 Is Not Satisfactory

By Frank H. Miller
Vice-President in Charge of Engineering Louisville (Ky.) Railway

In 1913 the Louisville Railway had occasion to renew a section of 9,400 ft. of trolley wire on Fourth Avenue, which is one of the main residential streets of the city. For this purpose round steel trolley wire, size No. 000, was purchased and installed in the fall of that year.

The cost of this steel wire at that time was 6.5 cents, while the cost of hard-drawn copper was 16 cents a pound, delivered in Louisville. The construction used was of the ordinary span-wire type on wood poles with 100-ft. spacing and making use of 12-in. clinch ears. The 9,400-ft. section on which the steel wire was erected is in the middle of the line in question. The daily mileage over this steel wire is 1,030 motor car-miles, while the daily mileage over the entire Fourth Avenue route is 3,558 motor car-miles. The trail car mileage on Fourth Avenue amounts to 400 a day. The steel trolley wire is paralleled by a 1,000,000 circ.mil feeder cable with feed taps every 1,000 ft., so that the question of conductivity was a negligible consideration.

This line loops through the business section of Louisville and extends out into the residential district. The downtown end is equipped with Phono electric trolley, the center section with the steel wire and the suburban end, which branches and extends about 3.5 miles outside the city limits by two separate routes to a public park, is equipped with copper trolley. The life of trolley wheels on this southern or suburban section of the line is considerably less than the average mileage in the city, due to the high speed, exposure to sleet and greater proportion of trailers run.

The experience of this company with the steel wire is indicated by the two tabulations printed herewith. In the following table is shown the average mileage obtained from 6-in. trolley wheels during the years 1916 to 1920. The first five items in the table show the average mileage on five representative lines, while the sixth item shows the average mileage obtained from the combined figures of the twelve city lines. These averages are compared with that obtained on the Fourth Avenue line with its 9,400-ft. section of steel overhead, from which it is seen that the average mileage per trolley wheel is some 4,300 miles less than the average for the entire system.

TABLE I—MILEAGE OBTAINED FROM 6-IN. TROLLEY WHEELS

	Miles
Line A	9,202
Line B	11,323
Line C	11,964
Line D	13,559
Line E	16,786
Average for twelve city lines, including Fourth Avenue	13,053
Fourth Avenue Line	8,766

In the other tabulation is shown the amount of wear that has taken place on the steel wire itself, as indicated by micrometer readings made recently, the ears having been removed to take the measurements. The measurements indicate the amount of wear after seven years' service of the density noted above. Corresponding with each figure given is a symbol denoting whether the trolley wheel was usually taking power or coasting at the various locations named.

There have been only two breaks in this steel trolley wire during its life. One of these occurred during excessively cold weather in January, 1918, when the temperature was 15 deg. F., and the other occurred in January, 1920, from unknown cause.

The steel wire causes a brownish rusty deposit on

TABLE II—WEAR ON STEEL TROLLEY WIRE IN LOUISVILLE, KY.
(Diameter New 0.412 In.)

Location		Horizontal Diameter	Vertical Diameter	Under Ear H. Dia.	Under Ear V. Dia.	Remarks
S. B. wire 100 ft. S. Broadway	P	0.367	0.359	0.393	0.298	
N. B. wire, 100 ft. S. Broadway	C	0.387	0.373	0.407	0.389	Wire bright on top and sides
S. B. wire 100 ft. N. Breckinridge	C	0.385	0.371	0.412	0.389	
N. B. wire 100 ft. N. Breckinridge	P	0.387	0.367	0.370	0.271	
S. B. wire 150 ft. S. Breckinridge	P	0.335	0.307	0.331	0.307	
N. B. wire 150 ft. N. Breckinridge	P	0.367	0.348	0.403	0.324	
S. B. wire 100 ft. S. Kentucky	P	0.317	0.264	0.338	..248	
N. B. wire 100 ft. S. Kentucky	C	0.361	0.343	.....	.....	
S. B. wire 250 ft. N. Oak	C	0.327	0.271	.....	.....	
N. B. wire 250 ft. N. Oak	P	0.325	0.272	0.403	0.299	
S. B. wire half way between Oak and Ormsby	P	0.377	0.306	.....	.....	Center of span
N. B. wire half way between Oak and Ormsby	P	0.350	0.301	.....	.....	Center of span
S. B. wire N. S. of Magnolia	P	0.334	0.255	0.267	0.212	Worn badly.
N. B. wire N. S. of Magnolia	P	0.337	0.277	.....	.....	Splice here.
S. B. wire 100 ft. S. of Magnolia	P	0.349	0.305	.....	.....	
N. B. wire 100 ft. S. of Magnolia	C	0.357	0.316	0.409	0.365	Wire bright top and sides.
S. B. wire 50 ft. south of railroad crossing a street	P	0.340	0.288	.....	.....	Center of span.
N. B. wire over railroad crossing a street	C	0.331	0.264	.....	.....	Center of span.
S. B. wire 100 ft. North of Avery	C	0.375	0.342	.....	.....	
N. B. wire 100 ft. North of Avery	C	0.381	0.360	.....	.....	

P Indicates probability trolley wheel taking power at location indicated.
C Indicates probability trolley wheel coasting at location indicated.

the roofs of the cars and at night a line of fire follows the trolley wheel when it is taking power from the wire.

These considerations, including the shortening of the life of the trolley wheels, have led to the decision that when this wire is renewed, which we now expect will be in the fall of 1921, it will not be renewed with steel wire.

Labor-Saving Devices in the Way Department*

An Outline of the Ways in Which Costs Can Be Kept Down in Track and Paving Work, Together with Data as to Actual Saving Which Has Been Accomplished

By Charles H. Clark
Engineer Maintenance of Way the Cleveland (Ohio) Railway

ONE of the first machines a railway should purchase is a derrick. In a maintenance department yard a mast derrick is, of course, the cheapest. A derrick with a 25-ft. boom, mounted on a car, will handle 60-ft. rails, a ⅝-yd. clamshell and pieces up to 5 tons in weight.

The Cleveland Railway has two derricks of the above-mentioned type and also a 60-ft. mast derrick with a 70-ft. boom and a stiff-leg derrick with a 70-ft. boom. The last-named derrick operates on a special track 800 ft. long and is used to pile sand, coal, rails, special trackwork, cinders, etc. The same railway also has a 60-ft. hammerhead, full-swing, gantry derrick operating on a special track 800 ft. long. This carries a 2½-yd. Lakewood bucket and covers two unloading spaces 50 ft. wide and 800 ft. long. By its use a carload of coal can be unloaded in twenty minutes. The company also has a locomotive crane, standard gage, with a 50-ft. boom, which can be used on any track in the yard where there are no overhead wires. To facilitate the use of this crane all wires are carried in a protected trough alongside the track.

A derrick with a 50-ft. boom can be used to pile material high, saving trackage and yard space. Granite blocks on our property are sometimes piled 25 ft. high, which could never be done by hand.

Another useful device on an electric railway property is a stone crusher, which will save tons of old stone otherwise useless. Old paving stone can be crushed for from 40 to 50 cents per yard. In normal times crushed stone would cost $1.25 to $1.50 per yard. A crusher also saves the expense of hauling crushed stone to a dump and unloading it.

There are further opportunities for saving in connection with cement. Cement bags as dumped at the mixer usually contain some cement, which we save by means of a bag cleaner which we constructed. A test showed that 1,000 bags weighed before cleaning 1,313 lb. After cleaning they weighed 606 lb., so that we saved 707 lb. of cement and the freight on this weight of bags shipped back to the mill. The saving in freight more than paid for the cleaning. We also lessened the expense of piling cement in the storehouse by the use of a belt conveyor and electric trucks.

Sand driers are a source of expense to a large road. We have used a large rotary drier for about seven years, and with it two men can dry from 100 to 150 tons of sand per day. On the Cleveland Railway we also use a portable sawmill on a flat car for sawing up old ties into blocks used for blocking up tracks and also for emergency heating purposes.

Some Notes on Track Construction

In the design of structure for car tracks economies are possible. With solid concrete construction, steel ties embedded in concrete are less expensive than wooden ties with tie plates. With the former there is less excavation and less concrete. For construction work temporary tracks can be laid on the sides of the street where there is sufficient room. Eighty-pound T-rail can be laid on the pavement on 1½-in. boards, with tie rods and gas-pipe spreaders to maintain gage.

In Cleveland most of the trackwork consists in relaying tracks, involving the taking up of the pavement. This we do with a pavement plow which will loosen 7,000 sq.ft. in three minutes. Concrete track foundation also has to be broken up. Instead of using picks, hammers and bars as formerly, we now break it up with a special machine that will do the work of 100 men. After breaking out the foundation, we cut up the old rails with an oxyacetylene torch, with which two men can cut more rails than can twenty working with chisels.

COSTS OF TRACK LABOR AND MATERIAL, CLEVELAND RAILWAY. 1914 TO 1921

Date	Rate per Hour	Labor Applied	Material	Total
Jan. 1 1914	$0.19	$1.35	$2.49	$3.84
Jan. 1 1915	.19	1.12	2.70	3.82
April 1 1915	.22½	.....	.....	.....
Feb. 1, 1916	.25	1.47	2.64	4.11
April 1, 1916	.27½	.....	.....	.....
April 1, 1917	.30	1.85	3.14	4.99
June 1, 1917	.32½	.....	.....	....
Aug. 1, 1917	.35	.....	.....	.....
July 1, 1918	.42½	1.95	3.72	5.67
Jan. 1, 1919	.42½	2.21	3.88	6.09
Jan. 1, 1920	.50	2.24	4.56	6.80
Jan. 1, 1921	.40	.....	.....	....

In excavating, the electric shovel can be used where space is available. In Cleveland, after the excavation is complete, the rails are laid on the ties, the old material is hauled away in work trains and new material, such as gravel, crushed stone, sand, cement, etc., is brought in. The joints are then riveted with a pneumatic riveter, which heats rivets under 100-ton pressure and can drive eight of them in less than four minutes. The tops and bottoms of the plates are then electrically welded with a machine specially designed for seam welding. Most of the reaming and drilling is done with "Chicago Pneumatic" track-drilling machines. High-speed steel is used in all drills and reamers. Two men with one of these machines can do the work of ten with hand ratchets.

When the track is ready for concreting, the concrete mixer comes into play. We first used these mounted on wheels alongside the track, but now we have them mounted on car wheels with a distributing boom 30 ft. long. We formerly required twenty-four men to run and feed the mixer, but now use only eleven. We have also increased the number of batches mixed per day by 20 per cent by the use of a loading device attached to a 30-ft. conveyor.

We have not as yet been able to pave with anything but concrete with a machine, but are using with good success grouting machines made by the Lakewood Engineering Company. Another great labor saver is an automatic dump car, the top of which is only 5 ft. 3 in. above the rail. It will hold 18 cu.yd., can be loaded by hand and requires no assistance in unloading.

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*Abstract of paper presented before joint convention of Illinois Gas Association, Illinois State Electric Association and Illinois Electric Railway Association, held at Chicago, Ill., March 15 and 16, 1921.

Finally, I wish to call attention to a small item in labor-saving devices, but an important one, the common dirt shovel. We buy the best chrome-nickel steel shovel we can find. While these cost twice as much as the common ones, they last four times as long and do not wear down to a small spoon-like tool. We use an identification mark of three holes drilled in the blade.

The accompanying table shows what labor-saving devices have accomplished with us since 1914. Then we were paying a base rate of 19 cents per hour; track labor cost $1.35 per foot and material $2.49. These prices do not include paving or paving material. Since then the cost of labor and material has advanced greatly. Wages per hour have increased 163 per cent, while total labor has increased only 64 per cent. Material costs have increased 78 per cent.

Automatic Electric Car Coupler

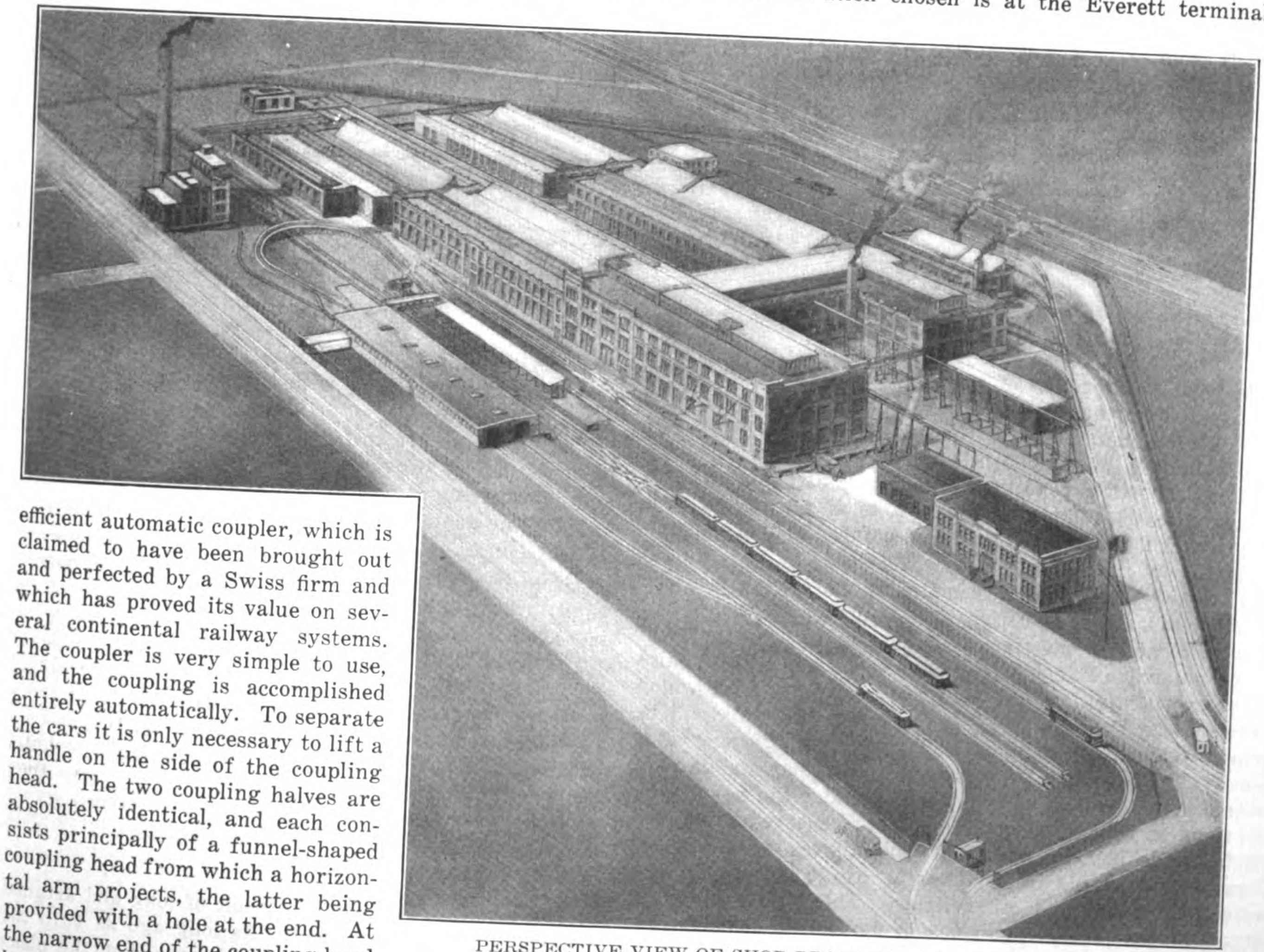
THE adoption of the plan of coupling together motor cars and the successful use of trail cars on several of the tramway systems in Great Britain, says the *Electric Railway & Tramway Journal*, has directed particular interest toward the subject of a really practical and efficient automatic coupler, which is claimed to have been brought out and perfected by a Swiss firm and which has proved its value on several continental railway systems. The coupler is very simple to use, and the coupling is accomplished entirely automatically. To separate the cars it is only necessary to lift a handle on the side of the coupling head. The two coupling halves are absolutely identical, and each consists principally of a funnel-shaped coupling head from which a horizontal arm projects, the latter being provided with a hole at the end. At the narrow end of the coupling head is a locking device, the principal part of which is the coupling bolt. The automatic coupling is provided with a boss on the side of the coupling head, on which the cables for the electric brakes can be fixed if required. The coupling head is attached to the car, just as in the old type coupling, by means of a rod provided with draw and buffer gear.

New Shops for Boston

Boston Elevated Railway Plans to Spend $5,000,000 for the Construction of a New Consolidated Set of Shops if the Massachusetts Legislature Will Lend State's Credit

THE trustees of the Boston Elevated Railway have just made public plans for the construction of a new consolidated set of shops at Everett, at a cost of nearly $5,000,000, and the entire abandonment of the several antiquated and scattered shops which have been in service for the last thirty or more years. This announcement was made by Edward Dana, general manager for the trustees, at a hearing before the committee on street railways of the Massachusetts Legislature, which has under consideration a bill lending the State's credit to the company.

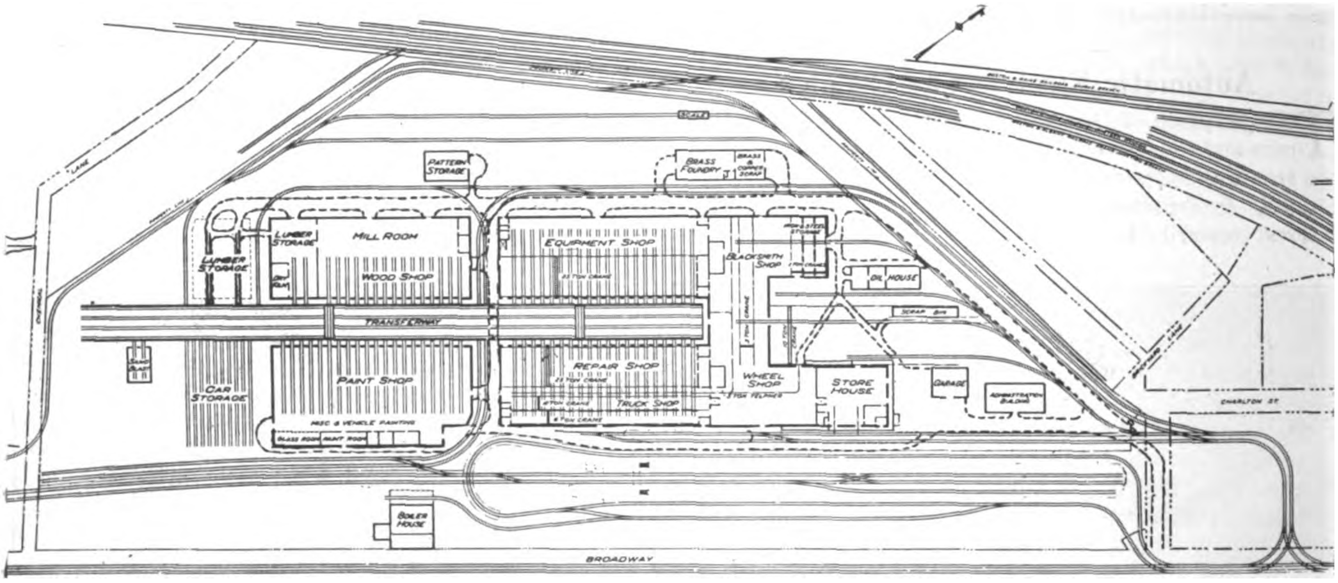
The general layout and type of construction proposed for the new Everett shops is best illustrated by the accompanying photographs of the plans which the officials of the Boston Elevated Railway submitted to the Legislature. It is proposed to handle all repairs, except such minor ones as are always done at carhouses, in the new shops, including rapid transit as well as surface cars. The location chosen is at the Everett terminal of the elevated line, about one mile north of Sullivan Square.



PERSPECTIVE VIEW OF SHOP PROPOSED BY BOSTON ELEVATED RAILWAY TO COST $5,000,000

The necessity for a complete new shop layout has been apparent to the elevated officials for a number of years, but owing to the severe financial conditions they were unable to proceed along the desired lines.

The present shops of the company were frankly characterized as "inadequate and inefficient" by Edward Dana when addressing the members of the Legislature on the subject. Moreover, the present shops, at Albany Street, Bartlett Street and Sullivan Square, are several miles apart, necessitating a divison of supervisory forces and a duplication of shop equipment and storeroom supplies. The Bartlett Street shop was originally used for horse-car repairs, and has been continued to the present day with only minor changes and repairs. The Albany Street shop is nearly as old. Lighting and other working conditions affecting shop employees are so bad as to have a very evident effect on production. The Elevated officials submitted a number of photographs with their report, illustrating the almost unbelievable congestion of machinery and facilities existing at the present time.



THIS IS A PLAN OF THE PROPOSED SHOPS OF THE BOSTON ELEVATED RAILWAY

The estimated cost of the new Everett shops is approximately $5,000,000 at present prices, but to offset this proposed expenditure savings are estimated aggregating $708,850 per annum. It is also expected that prices will be materially reduced before the final consummation of these plans.

Nearly one-half the estimated annual saving is based on the expected reduction in the number of cars out of service at any one time and the shorter time that will be necessary to hold each car out of service for repairs or overhauling, due to the greater rapidity with which work can be conducted. It is figured that this will be equivalent to a gain of 100 cars at an average value of $12,000 each. By means of the higher standard of maintenance that will be possible under the new conditions it is believed that a 50 per cent reduction will be made in the number of car failures, with a great resultant saving in lost time of crews, pull-in mileage, loss of fares and other items. The total savings on account of these conditions is figured at $332,500 per year.

The balance of the anticipated economies is as shown in the accompanying table.

It is believed by the management that the estimate of 10 per cent saving due to greater efficiency of labor under better working conditions is conservative. Attention is called to the fact that the present shops, particularly at Bartlett Street, are very poorly lighted, a great deal of the work being done by artificial light, in many cases portable electric lights being used. On account of the limited space available for repairs it is necessary to put various classes of workmen together on one car in order to get the car in order as soon as possible, which means that frequently carpenters, pipe fitters, wiremen and painters will be found at work around the same car. In some cases the tracks in present shops are on 10 ft. 6 in. centers, with numerous wooden columns in between. As the present large types of cars are 8 ft. 8¾ in. wide this leaves only a few inches between the building column and the side of the car.

The plans have been made on the basis of providing at the present time facilities adequate for the next ten years, with arrangements so that future extensions after that time can be made as required without disarranging or interfering with the routine work of the shops.

The buildings are to be of a modern fire-proof type of construction, provided with every up-to-date safety and labor-saving device, as well as appliances and facilities for the convenience and comfort of employees.

ANTICIPATED ECONOMIES TO BE EFFECTED IN THE NEW SHOPS AT BOSTON

Increase in efficiency of labor due td better working conditions, estimated 10 per cent	$200,000
More efficient separation and specialization of work	30,000
More efficient supervision	16,000
Labor-saving machinery and handling equipment	25,000
Reduction of hauling materials between shops	30,000
Consolidation of work on new equipment	12,000
Consolidation of stores	7,000
Reduction of force by consolidation of machine shops	12,000
Reduction of force by consolidation of truck shops	6,000
Reduced cost of heating	2,000
Reduced fire hazard and insurance	10,000
Reduction miscellaneous labor, watchmen, messengers	7,000
Rentals eliminated on Goodyear Building	15,000
More economical handling of lubricating, fuel oil	4,350

The general plans are the result of long and detailed studies by the management. As long ago as 1916 the site for the shops was chosen and since then the plans have been under way. Much of the planning has been done by John Lindall, superintendent of equipment. Many of the largest and most modern shops of steam and electric railways have been visited, and consideration has also been given to the best developments in car-building plants and automobile factories.

Comments on Reducing Shop Costs*

Shops and Shop Organizations, Responsible for a Large Share of the Operating Costs, Should Be Thoroughly Looked Into to See How They Can Contribute to the Reduction of Expenditures

By J. M. BOSENBURY
Superintendent Motive Power and Equipment Illinois Traction System, Peoria, Ill.

MUCH talk is indulged in nowadays about the serious financial and physical condition of the electric railways throughout the country and all are agreed that something must be done to save the industries from a calamity that has seemed inevitable. Therefore, it behooves all persons engaged in the business to study thoroughly their particular branch of it and see what they can contribute to bring about a change for the better.

Gross revenues have been good, but the appalling increase in operating expenses has dwindled the net down to, and in some instances beyond, the disappearing point. As the shops and shop organizations which maintain the cars and equipment of electric railways are responsible for a large portion of the operating expenses, it is well to look thoroughly into existing shop organizations to see what they can contribute toward reducing their expenditures.

This subject is a difficult problem to deal with in a general way because of the vast difference in the size of shops, which range all the way from the larger city shops with millions of dollars invested in real estate, buildings, machinery and equipment, employing many hundreds of men, handling hundreds of cars each day and expending millions of dollars per annum, down to the modest little shed without machinery or equipment, employing two or three men and handling two or three cars per day. But since all shops of whatever size are working to the same end, which is proper maintenance of cars and equipment at a minimum cost, any helpful suggestions that can be made will in a measure be applicable to all concerned.

WAR BROUGHT MANY TROUBLES

As is the case with many other industries, war conditions brought about most of the electric railway shops' troubles by attracting steady, satisfied, skilled mechanics and foremen to other lines of employment at unprecedentedly high wages and less exacting requirements. The war period also led to greatly increased prices for raw materials and manufactured repair parts necessary for the maintenance of cars and equipment.

A large number of the industries thus affected have been able to close down their shops and wait for better conditions, but the electric railway shop must keep on working at all hazards without stopping even for a single day.

It is true that war work long since ceased and the men formerly engaged therein have had to return to their old places or seek new ones, but these men have not forgotten their high wages and the easy times they enjoyed nor are they content to adjust themselves to present-day conditions and requirements without a struggle. This phase of the situation is quite easily observed by making a tour of inspection of shops and listening to the conversations that casually drift to one's ears. It is quite evident that some of the contributing causes of expensive shop work entering into the high costs of maintenance of cars and equipment are: Large labor turn-over, causing small output per man-hour, and incompetent men, due to lack of proper training and sometimes due to physical incompetency. There are even those who are wilfully incompetent and whose sole object is to do as little as possible and still stay on the job. Again we find men working under the handicap of not having been properly informed of the task before them. In other instances we find slow progress being made on account of workmen attempting to use improper materials or on account of the lack of spare parts, which entails much more time to do the task at a greater expense than if proper materials were available.

In an effort to better these conditions, it will be well for the chief executives of shops to investigate thoroughly the various heads of departments, supervisors and foremen to whom is intrusted the detail planning of the work as well as the supervision of the workmen and also the training of new men who enter their employ with the idea in mind of ascertaining their fitness for the duties intrusted to them. For example: A man may be a good supervisor but a poor workman, or he may be a poor supervisor and a good workman. Again, he may be both a good supervisor and a good workman, and yet be unable to impart his knowledge to others in a manner that will bring about the best results.

COMPETENT FOREMEN ARE SCARCE

Competent supervisors and foremen can, to a certain extent, overcome the effect of inefficient workmen, but such men seem to be scarce at the present time. Supervisors and foremen need training and preparation for their positions as well as the workmen who go through their apprenticeship courses to become competent mechanics.

The selection of supervisors and foremen should receive serious consideration. They should be men whose personal records of past performances as workmen warrant their promotion, after which they should be trained and tried out at the same time by placing them temporarily in authoritative positions in the absence of the regular incumbents, which gives them an opportunity of being instructed and coached in the duties of supervising and managing by those whose positions they fill temporarily. Then if they have ambition, ability and loyalty, they will soon demonstrate their qualification. If they do not qualify, they can be returned to the ranks without complications.

Hence, the supervisors selected to do the detail planning of the work, direct the workmen and train men for shop work should be those who are best qualified for and adapted to that particular position. That is, they should be competent to plan and execute, they should be men who understand the human machine, as well as the mechanical machine, and they should be able to impart their knowledge to others. They should have a real interest in the company and the company employees under their charge. Once an employee has been placed under their charge, the supervisors should be able to bring about a state of mind in that man that will induce him to give the company the best there is in him.

In order to enthuse workmen, it should be pointed out to them that the electric railway is not a passing industry, as many people would have them believe. Electric urban and interurban transportation will be with us for a long time to come and there is a future and not far distant time when steam railways must electrify, so that men now being employed or new men who will be employed in electric railway shops will have as much of a future ahead of them as in any other industry. It should be pointed out to them that many of the present executives came up from the ranks and there are opportunities for others.

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*Abstract of paper presented before Illinois Electric Railway Association in Chicago, March 16, 1921.

As the electric railway shop is one of the few industries that offer year-round employment for the men, with good working conditions and good compensation, the difficulties experienced in the last few years should begin to disappear and the electric railway shops should be able to attract and train good men into an organization that will compete favorably with many other industries in getting results at a minimum cost.

The same causes which were responsible for labor conditions up until a short time ago were also responsible for the shortage of material with which to make proper repairs and also for the excessive cost of same, but now that these conditions are fast disappearing, the shop executive has an opportunity thoroughly to overhaul his shop organization and get his equipment and maintenance cost down to a reasonable level.

MAINTENANCE COSTS UNDULY HIGH

In this connection, it may be well to state that in examining a large number of operating statements and comparing department costs, the cost of maintenance of equipment in a great many instances has increased in percentage more than any other department.

While war conditions did a great amount of harm to electric railway shops and organizations, they also brought about many new things that can be used advantageously in the industries. New materials were developed, old materials were improved, new processes were worked out and proved a success, new factories with improved machinery were constructed, and in many instances these industries, materials, developments and machinery are waiting for some one to come along and use them, and it is certain that in connection with the maintenance of cars and equipment there is room for improvement in materials now in use, and room for improvement in the processes of their manufacture, all tending to a reduction in cost and increase in life.

Maintenance of equipment in many instances has been held down to running repairs for so long that at the present time much work must be done and much material used to bring the equipment back to its normal condition. A company is judged more by the cars it operates, which are before the eyes of the public every minute of the day, than by any other thing. The electric railway shops and their organizations can be a big factor in bringing about better conditions all around by overhauling their equipment, making it safe, sightly and comfortable.

Inspection of equipment at regular intervals, usually on a mileage basis, when carried out systematically, is one of the biggest factors in preventing breakdowns in service, pull-ins, heavy repairs and high maintenance costs.

Of course, while inspection is being made, running or minor repairs should be made, all movable contacts should be cleaned, trolleys put in order and all bearings properly lubricated. In fact, the inspection should be so thorough and done by such competent men that after the car is turned out there is reasonable assurance it will run until the next inspection date without failure in service.

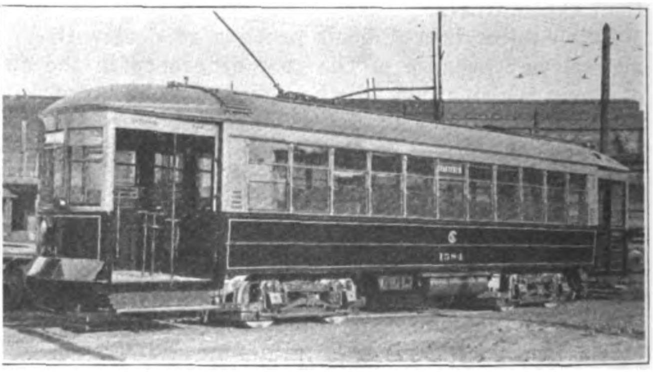
The electric railway car is the only piece of equipment of a highly complicated character that is operated by a man who has no interest in it excepting starting and stopping it, while another man has charge of the maintenance of the car and is held responsible at all times for its proper performance, and is the one censored in case of failure in service. Therefore, this person should lay down a comprehensive inspection schedule and get cars in at the proper time and by so doing cut repair bills to a minimum.

Chicago Brightens Up

Dark Green Color of Cars Gives Way to Red and Cream—Brighter Color Makes Cars Look Bigger and Also Should Reduce Accidents from Collision

CHICAGOANS have recently been startled by the appearance on the street of bright yellow and red street cars. The stay-at-homes thought a car from some strange parts was lost in Chicago, while the gadders thought they were in some other city. For since 1907 Chicago street cars have been painted a very somber green and it has been a very satisfactory color from the maintenance standpoint.

The new management, however, decided, after rather extended investigation and trials of various colors and combinations, to repaint all cars red up to the window rail and with a cream color for the superstructure, except for a red drip rail.



HOW NEWLY PAINTED RED AND CREAM CHICAGO CAR APPEARS TO THE CAMERA

There were several reasons for the change. One was purely the psychological effect on the public, both as an indication of a new management and because the brighter color gives the impression of more cars. The bright yellow taxicabs for which Chicago is famous demonstrated this theory. The bright paint makes the cars look bigger and more numerous. Furthermore, the visibility of the colors selected is an important factor in avoiding collisions. The dark green color has a low visibility and several accidents have been traced directly to this fact. The maintenance of the yellow and red, particularly the former, will probably be slightly more expensive than the old green hue, but the other advantages will offset this, it is felt. At present the cars are being put through on the regular overhauling and painting schedule of about eighteen cars a week, but this will probably be increased to about thirty a week shortly. At the time of this writing about 100 of the repainted cars are on the streets. The accompanying picture of one of the newly painted cars shows the reaction of the new colors on the photographic plate.

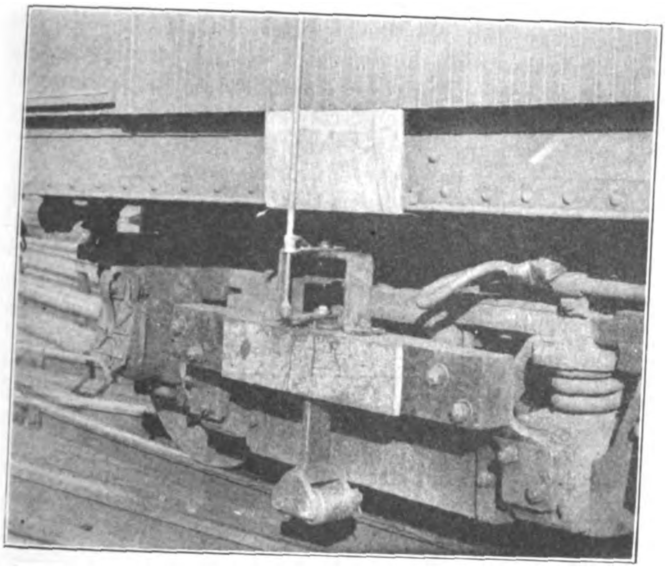
Third Rail Gaging Device

Variations of Third Rail from Its Correct Elevation Under Service Conditions Quickly Obtained by a Device Mounted on Car—Complete Survey of 180 Miles of Track in Fifteen Hours

BY W. A. BURNHAM
Assistant Superintendent Shops and Equipment Chicago Elevated Railways

IN CONNECTION with maintenance work, the Chicago Elevated Railways recently found it desirable to develop an indicating gage which would show the height of the third rail relative to the running rails under service conditions. On the elevated system the third rail insulators are mounted on the ends of the same ties that support the track rails and the proper position of the third rail is 6½ in. above the top of the running rail.

It was believed that the weight of passing cars might be causing a considerable variation in the difference in elevation of running rail and power rail, perhaps furnishing an explanation for some breakages of the current collecting shoes and sleet removing devices attached to the car trucks. Accordingly, a car was fitted with two indicating gages, as shown in the accompanying illustrations, and properly pivoted to make a correct indication on the curves. This device consists of a fixed brass tube attached to the truck below all springs, to represent the position of the track rail, and a round steel-end rod sliding inside the brass tube and fixed at its lower end to a hardened steel roller which bears on the top of the third rail and indicates its height.



THIRD RAIL ELEVATION GAGING DEVICE INSTALLED ON CHICAGO "L" CAR

With the roller set a standard distance of 6½ in. above the top of the running rail, a zero mark was made on the fixed tube and sliding rod, just outside one of the car windows. A scale reading in inches both ways from this zero mark on the fixed tube then indicated directly to observers inside the car, as it was operated along the track, whether the third rail was higher or lower than the standard setting and how much. Further to simulate service conditions scrap iron was placed in the car to represent passenger load.

With a car fitted with two such devices, one on each side, a complete survey of all third rail on 180 miles of track was made in fifteen hours. The survey furnished exact information of the conditions of the power rail relative to the third rail shoe under service conditions. It was found that the movement of the rail and tie under certain track conditions materially increased the relative height of the third rail with respect to the running rails and was the cause of some of the breakage of contact shoes.

Maintaining Ball Bearings

Some Data for the Life and Cost of Maintaining Ball Bearings on GE-258 Motors Show that They Are Cheaper to Maintain than a Sleeve Type and Their Life Is Generally Satisfactory

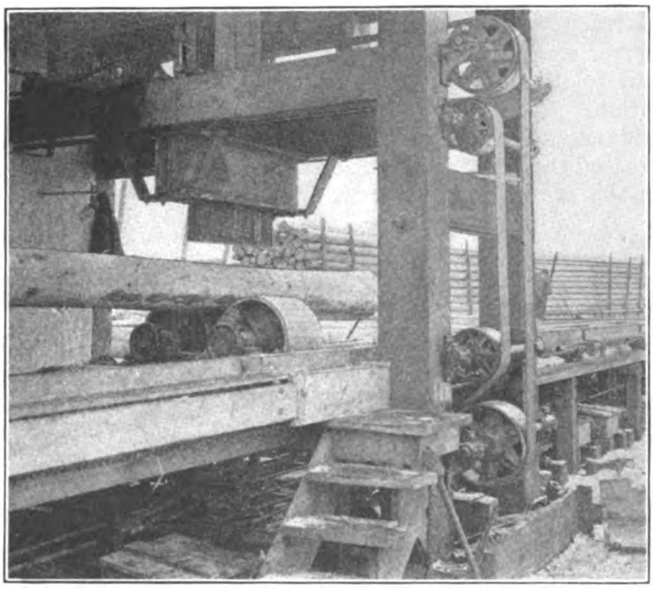
BY H. E. KROUSE
Master Mechanic Trenton & Mercer County Traction Corporation Trenton, N. J.

SINCE the advent of the GE-258 motor in connection with safety car equipment, questions regarding the service obtained and the cost of maintaining the ball bearings in this motor have been frequently asked. Results of several years' experience in maintaining this type of motor have led me to believe that ball bearings are ideal for this type of motor. An analysis of results obtained shows that they are cheaper to maintain than sleeve bearings and that their life is generally satisfactory. These conclusions are drawn from results obtained in continuous service on 19-ton cars for more than three years and on Birney safety cars for more than two years.

The life of any type of motor bearing depends to a great extent on lubrication and cleanliness. The ball bearing is better protected than the sleeve bearing and is less liable to have foreign substances mixed with the lubricant. One of the greatest economies in connection with the maintenance of ball bearings is found in the fact that it requires only a small amount of lubricating grease to keep them properly lubricated. We have been lubricating our ball bearings but once for every 6,000 to 7,000 car-miles, or where lubrication is done on a stated period rather than a mileage basis about once in every ten to twelve weeks. During the last ten months the lubrication of the ball bearings on 160 GE-258 motors has cost us on an average of but $15 a month for both lubricant and labor. During this period we have not had a single bearing failure. A few pinion end bearings have been removed for defective balls, after having made an average of 140,000 car-miles. These bearings were removed during the overhauling of motors which had been in constant service for three years.

The majority of these bearings, however, were found to be in good operating condition, which led us to believe that the average life of the pinion end bearings on initial installations should exceed 175,000 car-miles and the commutator end bearings should average at least 250,000 car-miles with proper care and favorable conditions.

Our lubrication is done with a fool-proof grease gun which has a capacity of 2 gal. of grease and which is very positive in its action. This large capacity is desirable, as it makes reloading of the gun unnecessary while lubricating from fifteen to twenty cars each having two motors. The type of gun which we use is manufactured in several sizes by the Runyen Manufacturing Company of Grand Rapids, Mich.



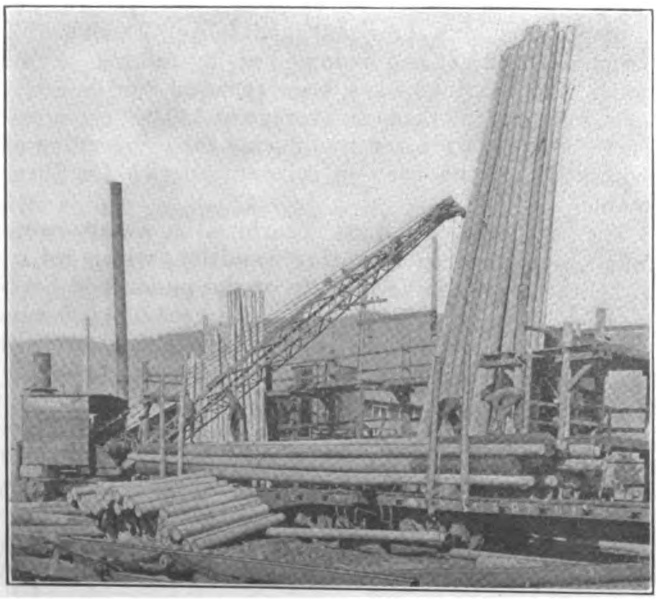
PERFORATING MACHINE IN OPERATION AT SANDPOINT, IDAHO, IN CONNECTION WITH THE TREATMENT OF CEDAR POLES WITH CREOSOTE

Puncturing Poles Before Impregnation

A Machine Designed to Puncture the Sapwood of Red Cedar Poles at the Butt Has Been Placed in Operation Which Assists Materially in Insuring Complete Impregnation

AN IMPROVED puncturing machine designed to puncture the sapwood of red cedar poles at the butt to permit a thorough impregnation by creosote has recently been put in operation by the Western Cedar Preservers Company at Sandpoint, Idaho. This machine is said to represent a long step forward in the preservation of cedar poles. It assures a full sap penetration with either green or seasoned poles treated by what is known as the "B" method. This consists of immersing the poles for from four to twelve hours in an oil bath heated to from 212 to 230 deg. F., followed by a cold oil treatment of from two to six hours.

The puncturing is done by forty-two iron bars 4½ ft. long, 3 in. wide and ¾ in. thick, which weigh approximately 37 lb. each. A detachable point holder on each bar makes possible the regulation of the depth and spacing of the puncture. At present, chisel-shaped points are in use, each ½ in. long and spaced so that a complete penetration will be obtained if the oil travels 1½ in. lengthwise of the pole and ⅛ in. crosswise.



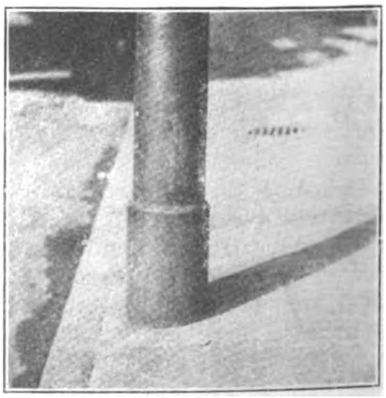
LOADING POLES AFTER TREATMENT UPRIGHT IN AN 11-FT. TANK

Each bar works independently of all the other bars in order to take care of the irregularities of the pole. These bars are raised by cams and drop by gravity. The machine is constructed so that the operator can regulate the distance the bars drop by simply raising or lowering the hoist on which the pole rests. The pole is transported under the bars by live rolls and then raised into position by hoists. The part of the pole to be punctured is supported on two oscillating wheels, 24 in. in diameter and 18 in. wide. These wheels are so constructed that no matter what position the pole is in or what taper it may have it will have a full 18-in. bearing surface on the two wheels.

Discussing the results obtained, W. M. Leavitt of Spokane, manager and secretary of the company, said in a paper read before the American Wood Preservers at their seventeenth annual convention in San Francisco this past January: "The time at which complete impregnation may be observed varies from the time the pole is removed from the treating tank up to two months after the time of treatment. In a properly punctured pole we have not, however, had a single instance where we did not eventually secure a complete impregnation to the depth of the puncture providing the puncture did not enter the heart wood."

Cut Pole Repair Cost

STEEL poles have a habit, after being in place for several years, of rusting and rotting at the base where they enter the ground. Various methods have been used from time to time to strengthen or repair such poles. One method has been to fill the inside with concrete to a distance of 2 or 3 ft. above the ground and reset the pole in concrete. This method the Cincinnati Traction Company has used to some extent in the past. Another method which this company has used more extensively is to set a new pole in place of the one to be repaired, cart the old pole to the shops and swage on a new sleeve purchased to fit the lower section of the old pole. Under this latter method of treatment, the cost per pole repaired varied from $16 to $26.



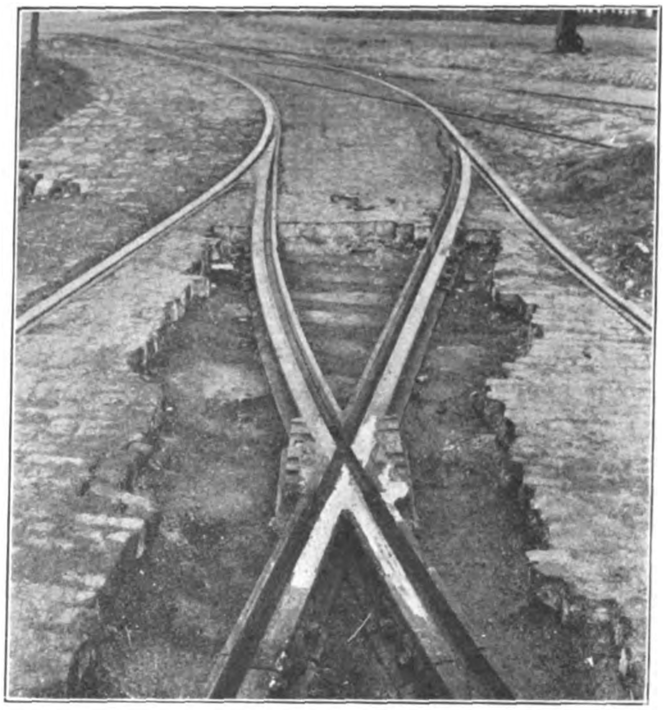
SLEEVE REINFORCEMENT OVER RUSTED PORTION OF STEEL POLE

About two years ago the company started repairing such poles in a new way and at a great reduction in cost. A large amount of old pipe, in scrap pieces, was bought up, in size 1 in. larger (measured by inside diameter, pipe size) than the lower sections of the poles. This was cut up into 24-in. and 30-in. lengths. When a pole is to be repaired the cross-arm and other "trimmings" are removed from the top, the sidewalk is cut away and the base exposed 12 or 15 in. below the ground. Then the section of pipe, as a sleeve, is dropped over the pole, the longer sections being used for the more seriously rotted poles. There is left a space of about $\frac{3}{16}$ in. between the pole and the inside of the sleeve. Metal wedges are inserted to maintain this even all the way round and grouting put in, filling the space and being finished off with a little slope at the top to drain off moisture which runs down the pole. In some cases these sleeves were arc welded at the top. When the grouting has set, the pole is then secured by filling in at the base, as before, and the trim put back on.

The appearance of the repaired pole is shown in the accompanying illustration. This also shows how little disturbance is necessary in the sidewalk. The most interesting part, however, is the cost. F. J. Venning, superintendent of overhead, who furnished the information for this article, stated that during the past two years 650 poles had been repaired in this manner at an average cost of $6.50. This is quite striking in comparison with the former cost of $16 to $26.

A Device to Prevent Rail Creepage

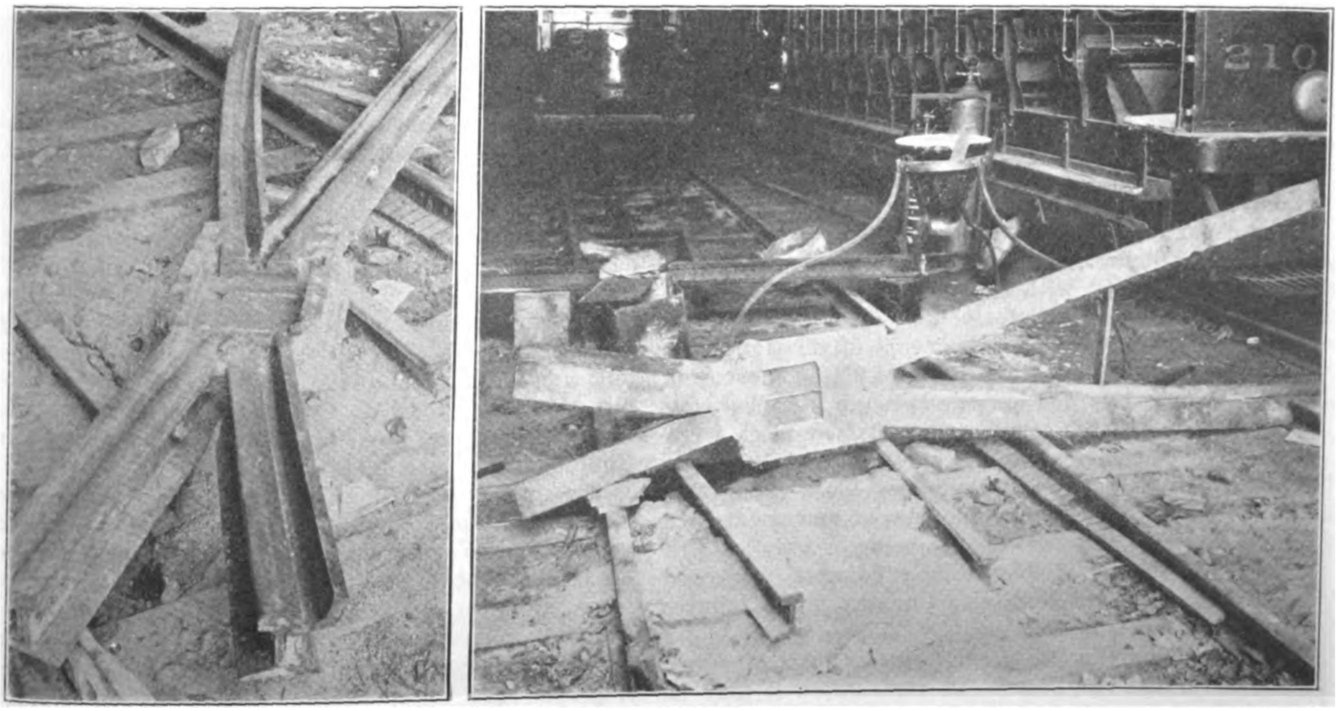
A NEW development has been made in the method of retarding creepage of rails by anchoring a number of ties to the joint tie. For connecting the ties together a new device called the "Trak-ankor" is being manufactured by the Track Specialties Company, New York City. The device consists of a flat steel bar punched with spike holes to be attached to the joint ties and the preceding four or six ties, depending upon the severity of the creepage. In order to bunch the joint ties, tighten the gage of track, or cause other track ills due to rail creepage, ties with this device must drag six or eight ties instead of two as with the usual type of anti-creeper. Based on 2,880 ties, spaced 22 in. apart, and 364 rails per mile, the cost per mile for the "trak-ankor" would be $273.



REPAIRED PART IN PLACE READY FOR SERVICE

Repairing Box of Manganese-Insert Frog

THE accompanying illustrations show a somewhat unique application of thermit welding in repairing the cast-iron box of a manganese-insert frog installed near the carhouses of the Union Street Railway, New Bedford, Mass. This box was broken just at the edge of the manganese steel center as a result of car traffic. In carrying out the repairs the frog was removed from the pavement and the manganese center was taken out. The end part of the cast-iron box outside the fracture was cut away with hammer and chisel, to provide space for the new metal. That part of the end of the cast-iron box which remained was then thermit-



TOP AND BOTTOM VIEWS OF THE WELDED BOX

welded in the usual manner to two rails on the same side. Top and bottom views of the complete weld are shown in the illustrations and give a fair idea as to the extent of the operation. The welding of this frog required two days of time and 85 lb. of thermit.

After the welding operation had been completed, the excess metal on the weld was removed and the manganese plates were again inserted in the cast-iron box and secured to the box by means of spelter. The repaired part was then reinstalled in the street. An additional illustration shows it in place ready for service.

Method of Signal Maintenance in Chattanooga

Analysis of Signal Troubles and Failures for Year 1920 as Compared with 1919 Shows Substantial Decrease, Which Can Be Attributed Directly to Improved Maintenance

THE annual report of the signal department of the Chattanooga Railway and Light Company, Chattanooga, Tenn., gives a comparison of the signal performance of the year 1920 with that of the previous year. The railway company has twenty blocks, comprising forty Nachod signals, of the trolley contact variety used for single-track opposing movements and permitting following movements through the same block.

The signals give indications by lights and disks, have oil-immersed relays and contactors of the wiping type without moving parts. Most of them were installed ten years ago. In giving a summary of its activities in 1920 the signal department reports that during the year nearly all of the signals had been repainted, two blocks of type MD signals were converted into type CD and eight blocks of type MD converted into type C, all this work having been done by the signal department.

Moreover, the relays in these signals were adjusted to operate on low voltage, such as occasionally happens on the line on which they are installed. Four old-style relays were overhauled, rewired and converted into the latest type. Five other relays were overhauled and adjusted. Thirty overhead trolley contactors were taken down and replaced with ones that had been previously repaired and painted, and these in turn were repaired and painted. Twelve poles having signals mounted thereon were rewired in conduit.

The department also installed and maintained Cheatham track switches. Four of the latest type for heavy duty were installed with drains to the sewer and are reported as working satisfactorily.

The total yearly signal movements of all signals in 1920 was 1,709,820 and in 1919 1,745,950, a movement being considered as one passage through a trolley contactor. The average yearly movements per block were 85,490 and 96,986, respectively, in 1920 and 1919, the average daily signal movements per block being 234 and 264 respectively. The numbers of movements per failure were 11,954 and 11,336, being a gain of 618 movements during 1920, which indicates improved maintenance. There were also thirteen fewer failures in 1920.

The accompanying table shows an analysis of signal failures for the two years. In explanation it may be stated that every kind of trouble reported is counted a failure, and it is stated that the car crews are not a bit lax in reporting trouble.

Under the heading "Line wires" is included all trouble with the line wires, whether open-circuited, crossed with each other, or crossed with other wires; 9.1 per cent of all failures were from this cause, while in 1919 this percentage was only 5.1. Blown fuses result mostly from lightning storms. "Relay trouble" covers everything involving the signal-box mechanism, such as bad coils, contact fingers and interior wiring. The troubles, together with setting and clearing contactors, are the only ones properly chargeable to the signal devices themselves and amounted to only 23.1 per cent of the failures in 1920, as against 33.4 per cent in 1919. From this it will be seen that more than three-quarters of the signal failures in 1920 were brought about by external conditions and did not arise from the signals themselves.

ANALYSIS OF SIGNAL FAILURES

Trouble Found	1920		1919	
	Number	Per Cent of Total	Number	Per Cent of Total
Line wires	13	9.1	8	5.1
Pole wiring	19	13.3	10	6.4
Blown fuses	16	11.1	29	18.6
Lamps out	34	23.8	15	9.6
Relay trouble	22	15.4	24	15.4
Setting contactor	4	2.8	9	5.8
Clearing contactor	7	4.9	19	12.2
Bad grounds	7	4.9	9	5.8
Miscellaneous	1	0.7	20	12.8
No trouble found	20	14.7	13	8.3
	143	100.0	156	100.0

These figures for 1920 show that a failure due to the signal mechanism occurred in one block on an average of about once in 220 days, which emphasizes the thoroughness of the maintenance program.

A daily signal report blank is used by the railway company. This report is dated and has separate sections for the dispatcher's report of the trouble and the signal department's report on its correction. The dispatcher's report has the following column headings: Division, Signal location, Reported by, Received by, Time received. The signal department's report is headed Time received, Date O.K., Time O.K., Nature of trouble, Signed by.

Aid in Solving Maintenance Problems

THE Westinghouse Electric & Manufacturing Company, in its plan of service to the electric railways, issues, from time to time, maintenance information under the name "Railway Operating Data." These data are prepared by practical engineers from the experience they have gained in visiting railway shops in all parts of the country. These data sheets contain information on all the varied maintenance problems that the operating man has to deal with. The subjects range from "Dipping and Baking of Railway Motors" and "How to Babbitt Motor Bearings" to "Installation of Air Piping to Prevent Freezing" and "Systematic Inspection of Car Equipments."

The railway operating data are first published in the *Electric Journal*. There is generally one subject and sometimes two or three covered in each issue. After the data have appeared in this manner, they are issued in loose leaf form by the railway department of the Westinghouse company, and the complete set, which at the present time comprises fifty individual articles, can be obtained free on application to any district office of the company.

Association News

Secretary Burritt Resigns

THE special meeting of the executive committee, mentioned in the issue of the ELECTRIC RAILWAY JOURNAL for March 12, was held last Tuesday at association headquarters to consider further the question of association finances. As a result of the meeting a letter was sent to all member companies by President Gadsden advising that E. B. Burritt had presented his resignation as secretary-treasurer, and that this resignation had been accepted. J. W. Welsh, special engineer of the association for the past two years, was appointed acting secretary to serve until further action is taken by the executive committee in the appointment of a permanent successor to Secretary Burritt.

Mr. Gadsden was asked if he cared to make a statement on the situation. He replied that as soon as the auditors of the association had finished their audit a complete statement of the situation would be sent to all members of the association. The books of the association are being audited under the direction of M. R. Boylan, general auditor of the Public Service Railway of New Jersey, who has audited the books of the association annually for a number of years. Mr. Gadsden said that so far the audit seems to show that the shortage may be in the neighborhood of $50,000 and that the defalcations were made by the bookkeeper, Gibson, through cashing vouchers which had been signed in blank by Secretary Burritt, when he expected to be absent from town. Gibson, as stated in the last issue of this paper, has been arrested, and in view of the failure of Secretary Burritt to safeguard the funds, it became necessary for the executive committee to accept his resignation.

When asked what the effect of these losses on the association would be Mr. Gadsden said that the executive committee had already assurances from a sufficient number of large interests in the association to be sure that when the amount of the shortage was determined there would be no difficulty in having it underwritten. This would mean that the amount so advanced to the association could be paid off by it over a series of years without in any way hampering the essential functions of the association. Continuing, President Gadsden said:

"We propose to take advantage of this situation to have a thorough examination made of the work of the New York office for the purpose of increasing its efficiency and decreasing its expenses, but we do not propose to let what has happened interfere in any way with the usefulness of the association in any essential features. Such changes as are made will be for the purpose of increasing efficiency and not merely for economy. One suggestion which the executive committee has received within the last week and which will probably be adopted is that in the future the offices of secretary and treasurer will be permanently divorced. The question of the selection of the new permanent secretary should have the serious thought of the entire industry. The executive committee will meet probably some time in April to select a new secretary. In the meantime suggestions of the best man to fill the vacancy will be welcome."

Mr. Burritt, the retiring secretary, was appointed to the office in 1913, succeeding H. C. Donecker, who resigned to become assistant general manager of the Public Service Railway of New Jersey. Prior to 1913 Mr. Burritt had been connected with the Washington Railway & Electric Company for a period of about six years.

Connecticut Company Section Holds Largest Meeting

THE Connecticut Company held its thirty-eighth meeting in New Haven on March 3. The Silver Street freight house, which has just been remodeled for use as a freight terminal, was used as an assembly hall. Here luncheon was served at 6:30 p.m. to 315 members and guests, an attendance which sets a new record. The men from Hartford, Meriden, Middletown, Bridgeport and Waterbury were brought in special cars.

The new president, Frank P. Harlan, opened the meeting, introducing Lucius S. Storrs, who was warmly welcomed. Mr. Storrs said that the employees of the company should be thoroughly posted on company matters. He began his talk with a history of the company from its incorporation in 1905 up to the present time. Some comparisons of earnings, expense, etc., were displayed on a large chart for 1917, 1918, 1919 and 1920, including the figures covering payrolls, coal, material, accidents, power purchased, etc. Mr. Storrs explained to the employees the bills before the present Legislature for relief from various burdens so that they might be prepared to answer questions and give facts and figures when the occasion required.

Vice-President J. K. Punderford spoke next, thanking the men for the good work done in removing snow after the storm of Feb. 20. Another speaker was John W. Colton, formerly executive assistant to Mr. Storrs and now on the editorial staff of the Hartford *Times*. He stated his belief that the Connecticut Company is in need of the proposed legislative relief.

New Arc-Welding Machine

A NEW electric arc-welding machine, especially intended for rail bonding and trackwork, but also adaptable for general repair and shop welding, has been brought out by the Wilson Welder & Metals Company. The machine was designed at the request of the Ohio Brass Company, which acts as sole selling agent.

A fundamental principle of this machine consists in providing uniform heat per unit area in the weld by means of a short arc automatically controlled. With this machine the potential across the arc is but 18 volts, and with this voltage it is impossible for the operator to hold a long arc. Current control is provided by means of a solenoid operating in conjunction with a carbon pile.

During welding the regulator automatically maintains the current at a practically constant value regardless of line variations. The short circuit current is held to about 10 per cent of the welding current. Heat is controlled within 4 per cent.

The dynamotor is wound for two voltages. One winding is for operation on from 350 to 650 volts direct current and the other winding on 150 to 350 volts direct current.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Uncompleted Track Bought

City of Detroit Acquires Lines Never Completed by the Detroit United Railway

An agreement was reached as to the price which the city of Detroit will pay for the stretch of the Detroit United Railway's track on Harper Avenue between Gratiot Avenue and Montclair the last day allowed by Federal Judge Denison in his order. The Judge, in deciding the case, issued an order that two arbitrators be appointed, and in case they could not agree as to the price a third arbitrator was to be appointed.

RAILWAY TAKES LEGAL ACTION

The track on Harper Avenue was never completed by the Detroit United Railway owing to the action of the City Council in rescinding the day-to-day agreement under which it was being constructed by the company. When the city proceeded to have the Department of Public Works remove the track from the street in order to make provision for the Municipal Railway, the company started proceedings in the federal court in February to prevent the tearing up of the track. Judge Denison of the District Court of Appeals ordered the city to post a sum of $50,000 as a guarantee to cover the sum settled upon by the arbitrators. The $50,000 was supplied out of the Municipal Street Railway bond issue.

Prof. Henry C. Riggs of Ann Arbor was appointed arbitrator by the Detroit United Railway. The city officials selected William H. Maybury. The track, approximately 4,800 ft. long, was valued by the Detroit United Railway at $47,191. The value finally agreed upon by the arbitrators, or the amount to be paid by the city, was $40,686. In deciding the amount to be paid for the concrete base upon which the rails were laid, the arbitrators allowed the Detroit United Railway 50 per cent of the cost. The city contended that only 15 per cent should be paid.

ST. JEAN LINE WILL NOT BE DENIED TO THE CITY

It has been further indicated by the Detroit United Railway that the crossing of the company's Mack Avenue track by the municipal cars on the St. Jean line will not be opposed. This is in accord with the company's announcement that crossings of its tracks will not be opposed provided the plans are submitted previously to its engineers for approval. The company's engineers and engineers for the city Street Railway Commission are to confer regarding the crossing at Mack and St. Jean Avenues. The present crossing was installed by the city under police protection while E. J. Burdick, general manager for the Detroit United Railway, was marooned on Belle Isle. In case the engineers do not reach an agreement for modification of the order issued by Judges Hart and Johnson restraining the city from crossing the company's tracks, the matter will be arbitrated.

The case is still pending which involves the request of Corporation Counsel Clarence E. Wilcox that the court pass on the city's rights to cross the company's tracks. Judges Hart and Johnson, in the Wayne County Circuit Court, ruled that the Mack Avenue crossing should not have been made by the city until after a hearing had been held on the company's temporary restraining order.

U. S. DISTRICT COURT ORDERS HARPER AVENUE TO CITY

The present proceeding with respect to the Harper Avenue track is in accordance with an order made by the United States District Court requiring the Detroit United Railway to turn over to the city the property of the company on Harper Avenue and Montclair Avenue constructed under the day-to-day agreement of 1919.

City Paid—Injunction Denied

Federal Judge Edward E. Cushman on March 4 filed a written decision in the United States court denying the motion for a temporary injunction by the Puget Sound Power & Light Company to tie the hands of the city officials in the Seattle railway bond case. Attorneys for the Power & Light Company stated when the case was called in the United States District Court that they abandoned the motion, and Judge Cushman's decision followed.

The motion was directed against the city of Seattle, Harry W. Carroll, city comptroller, and Ed. L. Terry, city treasurer, to enjoin them from applying the receipts from the municipal railway to maintenance and operating costs, or to anything other than payment of interest due on March 1, and to meet interest and principal on the $15,000,000 railway bond issue.

The treasurer filed an affidavit in the federal court stating that he had paid $375,000 due in interest on March 1, after filing of the motion which has now been denied. Judge Cushman's decision stated that the motion is denied without prejudice, because the interest was paid, and because of the action of attorneys for the plaintiff in abandoning the motion.

Albany Strike Before Court

Employees Bring Action Under Statute Passed by Last Legislature—First Case of Its Kind

Application was made on March 11 by the Albany and Troy unions to Supreme Court Justice Wesley O. Howard of Troy, N. Y., for a peremptory order directing the United Traction Company to proceed to arbitrate the strike controversy.

The unions, in arguing the petition, will demand that the company be compelled to live up to an arbitration agreement incorporated in a contract made with the men which does not expire until June 30 of this year.

HEARING SET FOR MARCH 19

Harry B. Weatherwax, vice-president of the United Traction Company, was served with a notice of the action. Application for the order will be argued on March 19. The application was made under chapter 275 of the laws of 1920, enacted by the 1920 Legislature and signed by former Governor Alfred E. Smith.

It is the first time the law has ever been invoked in an industrial dispute, though it has been held constitutional by the Court of Appeals in a case involving a mercantile dispute.

It will be contended that the expiration of a memorandum of agreement as to wages, which is a part of the major contract containing an agreement to arbitrate "any controversy" that might arise, did not void the major contract itself, and that that contract is now in effect.

The unions base their plea for a court order to force arbitration of the controversy on two sections of a contract made between the organizations and the company, "on or about the first day of July 1920."

OPPOSITION TO ARBITRATION EXPLAINED

The company has based its opposition to arbitration of the present strike controversy on a memorandum of agreement entered into on July 30, 1920, in which was incorporated a schedule of wages and compensation for different classes of workers.

Chapter 275, known as the arbitration law, was passed by the Legislature of 1920 and became a law April 19 by approval of Governor Smith. The law provides that "A provision in a written contract to settle by arbitration a controversy thereafter arising between the parties to the contract, or a submission hereafter entered into of an existing controversy to arbitration, pursuant to the code of civil procedure, shall be valid, enforceable and irrevocable."

One-Man Cars Attacked

Bills Against This Type of Rolling Stock Introduced in Massachusetts, Connecticut and Iowa

Backed by the American Federation of Labor the street carmen's unions in Massachusetts are making a vigorous effort to have the operation of one-man cars prohibited in the commonwealth by means of legislative enactment. At a public hearing held by the legislative committee on street railways the proponents of a bill to abolish these cars brought up all the usual arguments, stressing principally the alleged danger to the public which is claimed by the labor leaders to be the prime reason for their stand against them.

NEW CARS DEFENDED

Opposition to the bill was registered by nearly every railway in the state. The strongest plea against this bill was registered by the trustees of the Eastern Massachusetts Street Railway. This company is now operating more than 80 per cent of its mileage with one-man cars and Chairman Homer Loring of the Board of Trustees made it plain to the committee that it was a case of one-man cars or no cars at all. He characterized the bill as "an act to compel street railways to hire needless men against the best interests of the car riders, who are demanding lower fares."

So satisfactory are the one-man cars of the Eastern Massachusetts Street Railway from the standpoint of economy that Mr. Loring expressed the opinion that if they had been introduced to the present extent about two years earlier the number of abandoned lines in Massachusetts would not have reached the present unfortunate size. "The one-man car," said Mr. Loring, "is the salvation of the street railway industry. To prohibit its operation would impose great hardships upon thousands of people on the Bay State system who would lose their railway service entirely if the one-man cars were taken off."

CONNECTICUT BILL FAILS

Advantages of the long double-truck one-man cars which the Connecticut Company has remodeled and put into operation at Meriden, Conn., were set forth by J. K. Punderford, vice-president and general manager, at a hearing before the Public Utilities Commission at Hartford on Feb. 17. The hearing was held in response to a petition signed by a number of residents, alleging that the new long one-man cars were "unsafe, impractical and very inconvenient." The petition was presented by Frank O'Meara, Hartford, representing the street railwaymen's union of Connecticut. Most of the witnesses called were motormen and conductors.

The Connecticut House has since rejected the trolleymen's bill calling for a crew of two competent operators for trolleys on single track lines and on cars weighing in excess of 10 tons, no qualified motorman to do any duties of a conductor while the car is in motion.

A bill will be presented in the Iowa Legislature prohibiting the use of one-man cars in cities of more than 25,000 population, according to President Charles E. Rogers of Local No. 312, Street & Electric Railway Employees of America.

SIX CITIES AFFECTED

The proposed bill is of interest at Davenport from the fact that the Tri-City Railway has unofficially suggested the adoption of the safety car as a means of cutting operating expense and solving the traction problem along another avenue than that of fares.

Other cities in Iowa with more than 25,000 population are Sioux City, Waterloo, Cedar Rapids, Clinton and Ottumwa.

B. J. Denman, president of the local traction lines and vice-president of the United Light & Railways Company, believes that any one-man bill will fail of passage. Mr. Denman said:

> It is probably along the lines of the anti-safety car bills which have been introduced in the Legislature for the last five years. Menace to use of safety cars through legislation is not a serious one. I am confident that the cities now using safety cars will put up a strong fight for their retention.

Indeterminate Franchise Bill Before Governor

The indeterminate permit bill, which extends until July 1, 1923, the time during which public utilities in Indiana may surrender their franchises for indeterminate permits and come under the jurisdiction of the Public Service Commission, is now before the Governor for signature.

Three Indianapolis utilities, the Indianapolis Street railway, the Citizens' Gas Company, and the Indianapolis Water Company, have not surrendered their franchises, and will be in a position to act under the new law. Officials of the water company said no decision had been reached in regard to surrendering the franchise, and officials of the gas company said no action has been taken on the proposition. It is understood the railway will take advantage of the provisions of the law.

E. I. Lewis, chairman of the Public Service Commission, said the rate situation of no Indianapolis or other utility would be changed by the surrender of a franchise and acceptance of jurisdiction of the commission. He pointed out that under a decision of the Supreme Court the commission has granted emergency rate relief to the Indianapolis Street Railway and that the water and gas companies have petitions pending before the commission. The result, therefore, of the surrender of a franchise would be merely to place the public utility under the jurisdiction of the commission in other matters.

About sixty companies, operating approximately 100 utilities, which did not surrender franchises under the old law are in a position to act under the present legislation.

Municipal Relief Granted

Council of South Bend, Wash., Exempts Electric Railway from Paving Obligations

An excellent example of progressive municipal legislation is found in the City Council of South Bend, Wash., passing an ordinance on Feb. 9, 1921, granting exemption from paving along its tracks in that city to the Willapa Electric Company, a Sanderson & Porter property.

The preambles contained in this ordinance reflect a broad view of paving obligations imposed on electric railways. They are as follows:

> The City Council of the city of South Bend, Washington, do ordain as follows:
>
> Whereas, the Willapa Electric Company is the assignee and owners of the franchise rights and properties granted to the Twin City Railway under Ordinance No. 368, which was passed by the Council of the city of South Bend, Washington, on Jan. 3, 1911, and approved by the Mayor of said city on said date; and
>
> Whereas, the existence and operation of street railways are vital to the welfare and life of every city; and
>
> Whereas, street railways can no longer operate and earn a fair return on their investments if cities require them to expend funds for paving which is solely used and worn out by the public in general and not by the railway; and
>
> Whereas, it is now universally conceded that exemption from paving burdens is essential to protect the street railway industry from bankruptcy, and such exemption is recommended by the Federal Electric Railways Commission and also by the Public Service Commission of the State of Washington, for both of said commissions find that moneys expended for paving are ultimately paid by the patrons of the street car company, for it is the fares of these patrons from which the street railway must receive its funds in order to conduct its business and to pave the streets, and it is unfair to place this indirect tax and burden solely upon those who ride on the street cars; and
>
> Whereas, the city of South Bend, Washington, desires to protect existing investments made in good faith and thus encourage expansion and new and additional investments; therefore
>
> Resolved, That Sections 2 and 3 of Ordinance No. 368, which was passed by the Council of the city of South Bend, Washington, on Jan. 3, 1921, and approved bv the Mayor of said city on said date, be amended.

The sections of the original franchise amended by this ordinance were those which required the railway to pave with the kind of material used by the city.

$5,000 Prize Goes a-Begging

Last May the London County Council, London, England, offered a prize of £1,000 for the ideal tramcar. The competition was advertised all over Great Britain and the Colonies, in the United States, and in France. Some seventy-six proposals were sent in; the examiners have now reported on them. They say that not one of these efforts deserves the £1,000 prize:

> The bulk of the candidates have deemed it sufficient to send in one or more rough sketches, with incomplete descriptions of varying length. In these cases, no attempt has been made to work out the proposals, and, where it has been found possible to develop them, they have soon proved to be impracticable of application. There is a conspicuous dearth of proposals in respect to the electrical equipment and trucks or bogies. So much so that, in a majority of cases, a complete lack of electrical and mechanical knowledge is apparent with regard to these most important features of car design.

Moreover, many competitors have made suggestions incompatible with the local regulations, and even with the physical conditions.

$600,000 Terminal Planned

Expenditures Will Be Carried Out in Interest of Interurban at Indianapolis.

Plans were submitted to the Public Service Commission of Indiana on March 14 by the Indianapolis Street Railway for a central interurban freight terminal, to be constructed on the site now occupied by the Terre Haute, Indianapolis & Eastern Traction Company freight house at Kentucky and Oliver Avenues, at a cost of more than $600,000. Accompanying the plans were drafts of proposed contracts between the street railway and the interurban companies entering Indianapolis, which provide for relieving the local company from supplying freight facilities and placing the freight business entirely in the hands of the interurban companies.

A THREE-YEAR PROGRAM

The entire project is to be completed in three years and all freight will be handled at the central terminal after that time. The terminal facilities at the Traction Terminal station and adjacent buildings would be devoted exclusively to passenger and express service.

The plans submitted for the approval of the commission call for taking over the terminal of the Terre Haute, Indianapolis & Eastern Traction Company by all the interurban companies and the construction of additional facilities under three proposed projects.

The first project proposed for the construction of the new terminal calls for an addition to the present structure of 7,230 sq.ft. of floor space and 2,400 sq.ft. of platform. This work, together with the construction of two additional tracks and driveways, will involve an expenditure of $82,674.

The second project submits proposals for the construction of the west end of an outbound freight house and the completion of track projects. This proposed section of the freight house will have 7,230 sq.ft. of floor space in the building and 4,800 sq.ft. of platform. This project involves an expenditure of $67,344.

OTHER ROADS CONSENT

The third project calls for the completion of the second outbound freight house, an entire inbound freight house and driveways. The inbound freight house will have a floor space of 22,500 sq.ft. and the remaining section of the outbound freight house will have floor space of 9,300 sq.ft. in the building and 5,400 in platform. The total expenditure involved in the third project is $205,830.

A. W. Brady, president of the Union Traction Company of Indiana, stated that he was authorized to say that the interurban companies have tentatively censented to the project and have agreed among themselves on the basis for proceeding with the proposed work.

Robert I. Todd, president of the Indianapolis Street Railway, submitted a letter to the commission explaining the financial arrangements in the new contracts proposed for the companies. Mr. Todd said that the proposed readjustment of the freight contracts will result in about $28,000 a year additional income for the company.

Franchise Revision Urged at Richmond

Recent checks made by the Virginia Railway & Power Company in Richmond show that about seventy-five jitneys operate off and on throughout the day and that during the "rush hours" this number is increased to around 125. Mr. Wheelwright, president of the company, says the loss in revenue to his company in this way is considerable and may be expected to increase.

He regards the jitney as a general menace to the main transportation system of any community, and in a statement to the newspapers quoted from the opinion rendered by the Massachusetts Public Service Commission in the case of the Union Street Railway a few months ago which stated the situation very clearly. This decision, similar to many others, held that as between rival systems of transportation, it is reasonable and proper that the one which of itself is best adapted to furnish the form of service suited to urban conditions should survive.

Mr. Wheelwright said that if the same requirements were made of jitneys as are made of the street railway, the latter could take care of itself in competition for the traffic, but with a parasite eating away its short-haul traffic, the street railway cannot be expected to extend its service. This situation, he said, emphasizes more strongly than ever the necessity of prompt action on the part of the City Council on the petition of the company for a new franchise which has been pending since last autumn.

Italian Commissioners Will Inspect American Electrifications

The Italian - American Electric Company, representing all the Italian power companies, in connection with the Italian State Railways, is sending to the United States and Canada a railway electrification committee consisting of Guido Semenza, Milan, consulting electrical engineer; Gian G. Ponti, engineer, Municipality of Turin; Curzio De Regibus, Bologna, engineer, State Railway Service, and Ferdinando Cusani, Milan. The commissioners expect to arrive about April 23 on the Imperator. It is proposed to visit the following electric installations: Norfolk & Western; Pennsylvania; Baltimore & Ohio; New York, New Haven & Hartford; New York Central & Hudson River; Long Island; Hoosac Tunnel; London-Port Stanley; Canadian National Railways; Michigan Central; Chicago, Milwaukee & St. Paul; Butte, Anaconda & Pacific; Great Northern; Southern Pacific; California Central; Pacific Electric; Salt Lake-Garfield and important interurbans. The members of the commission will also study various city rapid transit systems.

New York Bill Advanced

Senate Rejects All Amendments—Assembly Advances Measure—Final Passage Likely March 22

All suggested amendments to the so-called Miller traction bill were voted down on March 16 and the measure looking toward the extension of relief to the railways of Greater New York was passed in its original form by the Senate by a vote of thirty-three to eighteen. In the Assembly the bill was advanced to a third reading and placed in a position for final passage on March 22.

The debate on the bill grew acrimonious at times. The principal objection to its passage as voiced by the opposition was to clothing the proposed new commission with power to put into effect temporary rates pending more extended study of the problems before them. Another provision that has been the subject of attack is the one in the section on unification of the lines which makes acceptance of the recommendations of the commission optional with the companies and obligatory on the city. The valuation provision has also been under fire. It provides for a valuation conducted under direction of the commission, such valuation as finally determined to be the basis for allowances to the railroads under the readjustment plan. The objection to this is that no means for review are provided.

The action of the Senate on March 16 makes certain that the transit bill will be in the Governor's hands for approval next week. It should become a law within a fortnight. The Governor has already made it known that he will give the opposition another inning and will fix a date for a public hearing when the bill reaches him. It is not expected, however, that he will delay his approval of the measure more than a few hours after the formality of this final hearing.

New Washington Terminal in Use

The Washington, Baltimore & Annapolis Railway is now using its new terminal at Twelfth Street and New York Avenue, Washington, D. C. The streets at that corner lend themselves particularly to a convenient arrangement which allows the cars to make the circle of the terminal building. The loading platform is on the company's own ground. This does away with the troublesome congestion which could not be avoided when the large interurban cars were forced to take on passengers in the street. The terminal building provides ample space for the ticket office, two large waiting rooms and a commodious newsstand, with numerous offices on the upper floors.

One of the features of the new terminal is the commodious platform space, where several cars can take on and discharge passengers simultaneously. In addition there are two sidetracks which may be used for the accommodation of cars being held in reserve.

Settlement at New Orleans Urged

No estimate has yet been made of the probable valuation of the railway property of the New Orleans Railway & Light Company, reports to this effect to the contrary notwithstanding. Receiver O'Keefe on March 6 published a statement in the local papers in which he vigorously denies the published statement attributed to Commissioner Maloney of the City Public Utilities Committee, that the company's own estimates showed the railway property to be valued at $45,000,000. Mr. O'Keefe has written a letter to Commissioner Maloney that no figures had ever been given out by him to indicate such an estimate.

As the responsible head of the company, Mr. O'Keefe declared in the letter to the commissioner: "I have neither furnished nor authorized any figures." He says that the engineering experts employed by the company had valued the property at $55,000,000.

Hugh McCloskey, chairman of the citizens' advisory committee on public utilities appointed by Judge Rufus E. Foster of the Federal District Court, is appealing through the local press to the public for such constructive suggestions and helpful advice as they might be able to offer, in written communications. Each particular suggestion, it is announced, will be fully studied by the committee in special charge of the subject matter. A prompt settlement of the problem, it is urged, is imperative.

Radial Finding Expected Soon

The finding of the commission appointed to inquire into the feasibility and financial prospects of a system of publicly owned hydro radials for Ontario is expected to be presented shortly. In a statement on the subject Premier Drury declared that the government will be governed by the report and the facts brought out. He said:

> If our consideration of the matter is such as to make it appear that the government is not warranted in pledging the credit of the province to the enterprise, we would not, however, stand for a moment in the way of the municipalities undertaking to go ahead on their own responsibility, with the one proviso that, with the facts before them, the electors should again vote on the matter.

Effect of Transportation on Real Estate

"Transportation is probably the greatest artificial agency in lowering, enhancing and distributing real estate values. Whatever depreciation it may cause is offset by appreciation of new sections which it opens up." This is the connecting link between transportation and real estate as explained by W. R. Warner, real estate agent of the Interborough Rapid Transit Company, at a recent Y. M. C. A. lecture in New York. The subject of the discourse was "Transportation as It Affects Real Estate." Mr. Warner outlined very briefly the historical development of transportation from the early days of stage coach to the present era of elevated and subway lines, showing that progress was the direct result of adequate means of transportation. Probably the greatest owners of real estate in the country are railroads. As proof of this statement Mr. Warner said that the Interborough Rapid Transit Company owned about $40,000,000 worth of real estate besides its strictly railway property. This has been secured through incidents of operation in the acquiring and abandonment of lines. As an example of lack of progress because of inadequate transportation facilities he cited modern China.

Dorchester Transit Study Continued

The Massachusetts Legislature has passed a resolve directing the Department of Public Utilities and the Boston Transit Commission to continue, jointly, the investigation of proposed rapid transit extensions of the Boston Elevated Railway in the Dorchester District of Boston. Details of the report of the commission to the Legislature were published in the ELECTRIC RAILWAY JOURNAL, Feb. 19, 1921. Several proposals are under consideration, including plans to utilize and electrify existing steam railroad branch lines in connection with the rapid transit service of the elevated.

Municipal Ownership and Jitney Bills in Iowa

Iowa cities will have the right to own and operate railways if a bill introduced in the Iowa Senate becomes a law. The bill is fathered by H. W. Byers, former corporation counsel for the city of Des Moines and at the present time in charge of the city's legal cases in connection with its difficulties with the Des Moines City Railway.

The bill as prepared by Mr. Byers gives cities the right to take over and operate railways in times of strikes or other public emergencies and authorizes cities to fix rates of fares for companies operating within the city limits and grants to the municipality power to prescribe the character of the service to be furnished. By the terms of the bill rates of fare may be fixed for a period of twenty-five years in cities where companies operate without franchises. Where a franchise is granted such time limit is fixed at ten years. Any plan for municipalization must be approved by a majority vote at a general election.

Motor buses and jitneys will be under stricter regulations in Iowa by the terms of a bill introduced in the House. The measure provides for a license fee of $100 for each motor bus and truck operated for hire and places the complete jurisdiction and control of the vehicles under the regulation of the State Board of Railway Commissioners. The bill further provides that operators of such vehicles for hire will be required to give bonds of $7,500 for the first vehicle and $2,500 for each additional vehicle.

News Notes

Careless Smoker Caused St. Louis Fire.—Investigation has disclosed that the fire which destroyed the De Balivere carhouse of the United Railways, St. Louis, Mo., on Jan. 3 started in a window slot where, doubtless, a smoker dropped a cigar or a cigarette stub which smoldered for several hours before the car itself burst into flames.

Amalgamated Paper Reprints Journal Article. — The *Union Leader* of March 12 has reprinted the article entitled "Service-at-Cost Plan an Incentive to Co-operation," which W. D. Mahon, president of the Amalgamated Association and member of the Federal Electric Railways Commission, wrote for the ELECTRIC RAILWAY JOURNAL in the issue of Feb. 12.

Wage Agreement to Stand.—Division No. 689 of the Amalgamated Association has decided not to reopen the wage agreement with the Capital Traction Company, Washington, D. C., this spring. Business Representative John H. Cookman says that the underlying cause for such action is not the present lowered cost of living, but the belief that the reduction in living costs will continue.

Roads and Road Transport Considered.—The first annual conference of the Institute of Transport was held in Manchester on Jan. 27 and 28. It was attended by nearly 500 persons. Though tramways are included within the scope of the institute, no papers on the subject were presented. The topics dealt with were roads and road transport, railway locomotive workshops, and canals.

Motor Buses May Replace Street Cars.—The Wisconsin Railroad Commission has announced that it will hold a hearing on the request of the Milwaukee Electric Railway & Light Company to substitute motor bus service on the Tippecanoe branch of the Howell Avenue line in Milwaukee. In its petition the company stated that the track on the branch in question is in poor condition, that reconstruction will cost $37,000, and that the branch has never paid expenses.

Men Not to Press Wage Demands.—The employees of the London (Ont.) Street Railway, who had demanded an increase of wages from 48 cents to 52 cents an hour, have decided to continue work at the present scale. The road has been under the management of the Ontario Railway & Municipal Board for the past year as the result of a series of strikes for more pay. The board has been paying the men a bonus of 1 cent an hour when the earnings of the company warranted it.

Inspection in Interest of Hydro Commission.—Engineers of the Ontario Hydro-Electric Power Commission are inspecting the right-of-way, rolling stock and equipment of the Chatham, Wallaceburg & Lake Erie Railway, with a view to adding the road to the system of hydro radials of the province. The municipalities along the line of the railway have urged the commission to take the line over. For the past few years it has been owned by the Mackenzie & Mann interests.

Employees of Municipal Line Receive Increase.—The New York City Board of Estimate increased the wages of municipal trolley employees on Staten Island on Feb. 25. The old scale for motormen and inspectors of 50, 55, 60 and 65 cents an hour has been raised to 57, 62, 67 and 72 cents. Foremen, linemen and carhouse foremen have been raised from 75 cents to $1; foremen of track laborers from 60 cents to 75 cents and $1; track repairers to 55 and 60 cents.

Want Pay Reconciled.—Conductors and motormen employed by the Alton, Granite & St. Louis Traction Company, East St. Louis, Ill., have opened negotiations to obtain the same rate of pay as men employed by the East St. Louis & Suburban Railway. C. B. Thomas, counsel for the receivers, said a conference would be held soon at which all questions concerning the receivership would be decided. Employees of the Suburban are paid 60 cents an hour, while the traction men get 59 cents an hour.

Trustee Control Attacked in Massachusetts.—The committee on street railways of the Massachusetts Legislature has granted leave to withdraw on two bills aimed at the trustees of the Eastern Massachusetts Street Railway who are operating the road under a public control act of the Legislature. One bill called for an investigation of the conduct of the property by the trustees, and the other bill sought to remove the road from the control of the trustees and return it under the general law to the ordinary regulation of the Department of Public Utilities.

City Loses in Des Moines Case.—The city of Des Moines, Ia., has lost its right to appeal from the decision of Judge Martin J. Wade in the 8-cent fare order. The appeal was heard by the full bench of the United States Circuit Court of Appeals at Kansas City on March 4 and was thrown out by reason of the fact that the city had not made the railway employees' union a party to the appeal. The union was an intervenor in the original proceedings and city attorneys overlooked this fact in filing the appeal. Attorneys for the city now admit that their only program is to wait for a decision from the Supreme Court of Iowa in the Ottumwa street railway case.

Another Canadian Electrification Proposal.—Proposals have been made for the electrification of the line of the Canadian Pacific Railway between New Westminster and Coquitlam, B. C., and the operation of this branch by the British Columbia Electric Railway. The line is about 8 miles long. Overtures made by the board of trade of New Westminster have met with rejection by the British Columbia Electric Railway on the ground that the company cannot undertake further capital expenditures at present and owing to the fact that other interurban lines operated by it do not indicate that the venture would be profitable. The Canadian Pacific Railway is required to meet all main line trains at Coquitlam and even this service is unsatisfactory to New Westminster people. There is a considerable mileage of freight yards in New Westminster which would come under the electrification scheme.

Blame Fixed for Trolley Collision.—Coroner John J. Phelan recently handed down a decision in the matter of fixing the responsibility for the collision on the lines of the Connecticut Company at Shelton, Conn., which resulted in ten fatalities and the loss of two cars. Besides holding the crew of the southbound car responsible the coroner also blamed Stephen T. Palmer, Shelton town clerk and judge of probate, who was taking home a five-gallon can of gasoline. Chief Engineer E. I. Rudd, in his report to the Public Utilities Commission, found that the number of deaths was caused by "asphyxiation and burns resulting from the sudden ignition of gasoline which escaped from a five-gallon can on the front platform of the southbound car." It was also found that the dead motorman failed to throw signals. The coroner said that the matter should be handled by the Public Utilities Commission in order that a like disaster may be prevented in the future.

Programs of Meetings

Southwestern Electrical & Gas Association

The Southwestern Electrical & Gas Association will hold its 1921 convention at the Hotel Galvez, Galveston, Texas, on May 18-21.

American Society of Mechanical Engineers

The spring meeting of the American Society of Mechanical Engineers will be held in Chicago at the Congress Hotel from May 23 to May 26. Sessions are planned by the Professional Sections on Aëronautics, Fuels, Management, Material Handling, Machine Shop, Power, Forest Products and Railroads.

Ontario Safety League

The monthly meeting of the executive committee of the Ontario Safety League was held at the King Edward Hotel, Toronto, on March 8. The meeting received a report of the subcommittee on the annual meeting. This report calls for a two-day safety convention to be held in Toronto on April 27 and 28.

Railway Supply Manufacturers' Association

After a thorough study of the entire situation both among the manufacturers composing the Railway Supply Manufacturers' Association and the railroad executives the executive committee of the Railway Supply Manufacturers' Association has unanimously decided to postpone the June, 1921, R. S. M. A. exhibit at Atlantic City. The decision was prompted by the fact that railroad and general business is depressed and that the desire exists everywhere to curtail expenditures in every possible direction. The association further gives notice that in view of the fact that it has postponed the exhibit and will dispose with its annual meeting and in no way be officially represented at the meeting of the mechanical division and purchasers and stores division of the American Railway Association it will not be necessary for any manufacturer to plan to have representatives present at meetings of the railroad officials.

Boat Trip for C. E. R. A.

The summer boat trip of the Central Electric Railway Association is assured. The committee in charge of arrangements, of which S. D. Hutchins is chairman, has just completed negotiations with the steamship company whereby a three-day or five-day cruise on the Great Lakes will furnish the setting for the regular summer meeting of the association. In order to secure the steamer *South American* for the usual trip from Toledo to Chicago, the committee had to contract for the round-trip from Chicago to Toledo and return as there was no other party desiring the boat for the east bound trip as in former years. This was done in anticipation that many members would be glad to extend the cruise two days by taking the boat at Chicago and the enthusiastic manner in which this plan has been received by the few who have been approached seems to bear this out.

The steamer will leave Chicago Sunday morning, June 26, and proceed without schedule stops to Toledo, arriving there Tuesday morning, June 28, about 8:30. It will leave there at 10 o'clock the same morning and arrive at Detroit at 3. The cruise from there will be routed through Lake Saint Claire, Saint Claire River, Lake Huron, Saint Mary's River, the Soo Locks, Mackinac Island, across Lake Michigan into Greenbay, Sturgeon Bay and thence to Benton Harbor and Chicago. The boat will arrive at Benton Harbor at 8:30, July 1, and at Chicago at 1 p.m.

The tickets for the trip including meals and berth and war tax will cost $70 for the round-trip from Chicago, $35 from Toledo to Benton Harbor and $37 from Toledo to Chicago. The details will be issued by the association headquarters in a bulletin now being printed. Reservations should be made with John Benham, International Register Company, 15 Throop Street, Chicago. who is secretary of the committee.

Financial and Corporate

Cleveland Dividend Not Earned

Only $910,000 Available to Pay Interest and Dividend Charges of $2,100,000—Increase of Stockholders

Gross receipts of the Cleveland (Ohio) Railway during 1920 exceeded those of 1919 by $1,895,609, or 12.10 per cent. Operating expenses, which included an allowance for depreciation, in 1920 were $4,961,252, or 34 per cent more than in 1919. Taxes were lower by 13.75 per cent and interest was higher by 4.89 per cent. These figures were shown in the report of President John J. Stanley at the recent annual meeting of the stockholders.

The president's report showed that rates of fare were changed twice in 1920. The rate was 5 cents cash, six tickets for 25 cents, 1 cent for transfer to May 11, when it was changed to 5 cents cash, 1 cent for transfer. This continued until Nov. 14, when the rate was raised to the maximum 6 cents cash, nine tickets for 50 cents, with 1 cent for transfer.

The following table shows the average fare at each of the three rates that were in effect during the year, the passenger receipts per day at each rate, and the percentage of increase in October over April and in December over October:

Month	Fare	Increase Per Cent	Revenue	Increase, Per Cent
April..........	4.74	....	$43,825	....
October........	5.30	11.81	48,063	9.67
December.....	5.95	12.26	51,938	8.06

The differences, however, were not due entirely to the changes in the rates of fare, for the number of fares increased by 1.47 per cent in October over April, and were 3.86 per cent fewer in December than in October.

NUMBER OF STOCKHOLDERS INCREASES

Stock of the Cleveland Railway at the close of 1920 was held by 5,531 holders, an increase of 237 over 1919. Of the stockholders 3,485 lived in Cleveland, 1,433 resided elsewhere in Ohio than Cleveland, 504 in other states and territories of the United States, and nine in foreign countries.

One quarterly dividend payment at the annual rate of 7 per cent was made during the year, but on account of suit brought to enjoin the election and decided in favor of the city by Common Pleas and Appellate Courts, the company could not continue to pay dividends at 7 per cent, and the last three payments were at the rate of 6 per cent per year.

At the referendum election on April 27 Clevelanders voted on proposals to construct subways in the downtown congested district for the benefit, or at least for the use of the company. The proposition was defeated by a vote of 28,895 to 14,092. At the same election, the proposal to authorize the issue of $15,000,000 of city bonds for the construction of the subways was defeated by a vote of 30,107 to 13,099.

During the year the company had a controversy with motormen and conductors in regard to work and wages. They demanded a wage of 90 cents an hour, or 50 per cent more than the maximum wage they were then receiving. After a series of conferences between the trainmen, city officials and company heads, the trainmen accepted President Stanley's offer of 70 cents an hour during the first three months of service, 73 cents during the next nine months, and 75 cents thereafter, with a six-hour minimum day. A new contract was signed, fixing the wages at these rates until May 1, 1921.

In concluding his report, President Stanley said:

> All authorities seem to agree that prices are coming down. Many prices have already come down. Copper and tin, exclusive of freight, are below the average prices of those metals in the ten years from 1905 to 1914. According to the Bankers' Commodity Price List the average price of all commodities on Dec. 1 was $501.75 compared with $564.01 a month before, $662.66 a year before, and $358.77 on Aug. 1, 1914. Coal is down. Wage reductions throughout the country range from 5 per cent to 60 per cent, a great majority being from 20 per cent to 25 per cent in December, and they may go lower. This means, in addition, that many men are out of work, which of course hurts the street railroad business.
>
> Predictions as to future business—building, industrial and commercial—vary. Our own big problem at this time is how to obtain funds to pay for needed extensions, additional rolling stock and other improvements. Our franchise provides that we may not pay more than 6 per cent for money to stockholders, bondholders, banks or any other persons. During the last few years money has been and it now is worth more than 6 per cent. As long as other people are willing to pay more than this rate for all obtainable money we cannot hope to get what we need. As long as investors can get a higher rate on other good securities they are not strongly tempted to buy our 6 per cent stock at par, and so, as Sir Robert Peale said, of Baring, the great European banker and lord of the British Treasury, our treasurer "sits on an empty chest by a pool of bottomless deficiency fishing for a budget" for betterments.

INCOME ACCOUNT THE CLEVELAND RAILWAY. BASED ON ACTUAL EXPENDITURES

	1920	1919	Per Cent Change
Passenger revenue*..................	$17,072,999	$15,223,060	+12.17
Other transportation revenue..........	130,668	101,344	+28.90
Other railway operations..............	178,691	134,830	+32.53
Total operating revenue..............	$17,382,358	$15,459,234	+12.44
Way and structures..................	$2,109,294	$1,550,532	+36.04
Maintenance car equipment...........	1,949,887	1,452,257	+34.27
Maintenance power plant.............	59,021	45,062	+30.98
Power-operation.....................	1,652,874	1,151,114	+43.59
Conducting transportation............	7,042,945	5,069,703	+38.92
General and miscellaneous...........	2,252,030	1,714,468	+31.35
Obsolete property...................	498,000	619,663	—19.63
Total operating expenses.............	$15,564,051	$11,602,799	+34.14
Net operating income.................	1,818,307	3,856,435	—52.80
Taxes...............................	1,082,185	1,254,637	—13.75
Operating income.....................	$736,122	$2,601,798	—71.70
Non-operating income.................	174,196	201,711	—13.64
Gross income........................	$910,318	$2,803,509	—67.53
Interest and dividends...............	2,101,239	2,003,253	+ 4.89
Surplus (*d*)........................	$1,190,921	$800,256	—249.00

(*d*) Deficit. * Including employees fares.

STATISTICAL INFORMATION THE CLEVELAND RAILWAY

	1920	1919	Per Cent Change
Miles of track operated..............	412.71	393.68	+19.03
Revenue car miles—			
Motor cars..........................	33,634,735	31,289,194	+7.50
Trail cars..........................	5,791,397	5,267,780	+9.94
Interurban cars......................	1,462,086	1,458,721	+0.23
Express and freight, mail, newspaper and chartered cars.........	203,022	218,741	—7.19
Total...............................	41,091,240	38,234,436	+7.47
Revenue passengers carried...........	327,840,438	291,419,501	+12.50
Transfers collected..................	120,156,602	109,129,292	+10.10
Total revenue rides..................	447,997,040	400,548,793	+11.85
Employees fares.....................	817,409	787,018	+3.86
Dead heads..........................	2,111,228	1,473,009	+43.33
Total rides..........................	450,925,677	402,808,820	+11.95
Rides per car mile..................	10.974	10.535	+4.16
No. of trip's run....................	7,957,178	7,378,521	+7.83
Rides per trip's run.................	57	55	+3.64
Passenger revenue—			
From cash fare passengers............	$15,970,086	$14,235,374	+12.19
From transfers......................	1,057,437	944,353	+11.97
Total...............................	$17,027,523	$15,179,727	+12.17
Average fare in cents per revenue passenger*.........	5.19	5.21	—0.38
Average fare in cents per ride........	3.78	3.78	0.00
Operating revenue per mile of track...	$42.117	$39.268	+7.26
Operating ratio......................	89.2	75.0	+14.2
Taxes, per cent of operating revenue..	6.24	8.12	—1.88

* Including employees fares.

Receiver Seeks Court's Advice

Desires Instruction with Respect to Preservation or Further Disintegration of Lines of New York Railways

Job E. Hedges, receiver of the New York (N. Y.) Railways, has appealed to the United States District Court for the Southern District of New York for instructions with respect to the preservation or further disintegration of the railway system now operated by him. The appeal was made on March 9. It was heard on March 14. The court directed the receiver to take no further action until May 2.

THE New York Railways system has already disintegrated to so large an extent that this has resulted in the public paying in many cases 7 cents or 10 cents for rides which had previously cost 5 cents. Unless some relief is granted, it is, in the opinion of the receiver, unavoidable that there will be a further disintegration of the system now operated by him.

The surface car lines in Manhattan would thus be split up into their component parts so that operated routes instead of being laid out for the convenience of the public and in accordance with the natural direction of travel would be laid out in accordance with the accident of antiquated franchise grants.

INCREASED EXPENSES TO PUBLIC

According to Mr. Hedges this would result in a number of railroads charging 5 cents or more for a short haul. In this connection he said:

> It may be that the Broadway line will be operated in two or more sections, and the Lexington Avenue line, which now runs from the Harlem River to the Battery, will be separate companies, each running a short distance only. The result will be a hodge podge of street car lines operated independently at greatly increased expenses to the traveling public.
>
> In facing the problems of the future of the street surface railways in Manhattan the number of people who use these lines should be considered. For the fiscal year ended June 30, 1919, there were, including transfer passengers, a total of 310,642,480 passengers on the lines of the New York Railways system alone.
>
> Of these 204,381,002 rode on up and down town lines and the balance on crosstown lines. About one-third of the total rides were taken in the rush hours. It is inconceivable that the public would desire to have these passengers forced to use the already overcrowded subways.

Mr. Hedges' summary in part showing present conditions of property of the New York Railways from the date of receivership, March 20, 1919, to present, is as follows:

	At Appointment as Receiver	At Present Time
Avenue lines	9	5
Crosstown lines	11	6
Total track mileage operated	151	73
Total free transfer points	287	18
Total 2c. transfer points	...	70

LEASES SURRENDERED AND PROPERTY RETURNED TO OWNERS

Eighth Ave. Railroad	Aug. 1, 1919
Ninth Ave. Railroad	Oct. 1, 1919
N. Y. & Harlem Railroad	Feb. 1, 1920

The surrender of these leases, continued the summary, cut off entirely the upper West Side service of the Broadway-Columbus, Broadway-Amsterdam and Sixth and Amsterdam lines. It removed from the system the Eighth Avenue, Ninth Avenue, Fourth and Madison Avenue and the Eighty-sixth Street crosstown lines, with resulting discontinuance at all but six points of exchange of transfers between those lines and lines remaining in the New York Railways system.

LINES TEMPORARILY DISCONTINUED

Avenue C, storage battery line, Sept. 21, 1919.

Spring and Delancey Street, storage battery line, Sept. 21, 1919.

Sixth Avenue Ferry, storage battery line, Sept. 21, 1919.

Chambers and Duane Street, storage battery line, Sept. 21, 1919.

Canal Street, crosstown line, Dec. 1, 1919.

One Hundred and Forty-fifth Street, crosstown line, July 11, 1920.

Operation of Seventh Avenue—Brooklyn and Fourteenth Street crosstown lines over Williamsburg Bridge ceased, March 7, 1920.

Transfers from Staten Island ferry boat ceased Sept. 15, 1919.

Transfers with Fifty-ninth Street, crosstown line of the Third Avenue Railway systemed, ceased Jan. 30, 1921.

FUNDED DEBT

(Interest *defaulted*—foreclosure suits pending.)

Principal, $18,063,539, New York Railways thirty-year first real estate and refunding mortgage 4 per cent gold bonds, annual interest $722,541.

Principal, $20,609,487, New York Railways thirty-year adjustment mortgage 5 per cent income gold bonds, if earned.

UNDERLYING MORTGAGE BONDS

Principal, $5,000,000, Lexington Avenue & Pavonia Ferry Railroad first mortgage 5 per cent bonds, annual interest $250,000.

Principal, $3,000,000, Columbus & Ninth Avenue Railroad first mortgage 5 per cent bonds (foreclosure about to be instituted), annual interest $150,000.

Principal, $350,000, first mortgage 5 per cent bonds South Ferry Railroad, annual interest $17,500.

Effective Aug. 17, 1919, the wages of all employees were raised, increasing the payroll at the rate of about $1,500,000 per year as the system was then constituted.

Effective July 18, 1920, a further increase in wages added upwards of $450,000 more per year to the payroll as the system was then constituted.

The aggregate increase in the payroll of the system as at present constituted over the same system at the time of the receiver's appointment is approximately $1,575,000 per year.

The rates of wages of employees have been increased 35 per cent since the beginning of the receivership, and the rates of pay, as compared with pre-war times, have been increased by considerably over 100 per cent.

OPERATING INCOME AND EXPENSES COMPARED, DECEMBER, 1920, WITH DECEMBER, 1913

	Rate in cents per mile Dec., 1920	Dec. 1913	Per Cent Inc'se
Operating income	65.65	39.27	67.18
Operating expenses and taxes	72.51	28.19	157.22
Net result	†6.86	‡11.08	*161.91
Payroll cost, included in operating expenses	39.79	14.13	181.60

†Loss. ‡Gain. *Decrease.

TAXES

Total accrued liability for taxes, including penalties and paving charges, payable to state or city, unpaid as of Dec. 31, 1920	$3,156,029
Total taxes or other charges levied or imposed in 1920 by state or city	1,563,047

TAXES IN CENTS PER CAR-MILE

United Railways (San Francisco)	1.86
Philadelphia Rapid Transit Co.	2.19
New York Railways	4.92

Claims against New York Railways in addition to claims on mortgage bonds.

(a) Claims for accidents prior to receivership unpaid:

Claims admitted	$1,350,695
Claims disputed or in process of adjustment	$377,949
Amount claimed in pending suits for which no claim has been filed	1,079,713

(b) Contract and other claims unpaid:

Admitted	$227,874
Disputed or in the process of adjustment	114,633,905

DEFICITS

	March 21, 1919, to Dec. 31, 1920	Aug. 1, 1920, to Dec. 31, 1920
Deficit from operating	$1,386,158	$240,215
Deficit after including non-operating income and outgo, but before deducting any interest on bonds or other requirements	1,479,213	195,279
Deficit after charging interest actually paid on certain bonds	2,819,243	467,239
Deficit after charging interest in default on underlying bonds and on New York Railways first real estate and refunding bonds in hands of public	4,596,631	933,240

VALUE OF PROPERTY STILL RETAINED BY RECEIVER

Cost of pre-war prices, less depreciation	$55,173,996
Cost at June, 1919, prices less depreciation	85,887,426
Assessed value of real estate alone	20,255,700

The summary of the report is concluded with a statement of the jurisdiction over fares as exists at present. The receiver says that he has under consideration the surrender of the leases of the following lines: Broadway and Seventh Avenue, Sixth Avenue, Christopher and Tenth Street, Bleecker Street and Fulton Ferry.

California Tax Bill Passed

Extravagant State Administration Calls Upon Corporations to Pay—Governor Glad People Rule

The California State Legislature on March 5, after passage through the Senate, finally passed through the Assembly by a vote of fifty-four to twenty-six the King tax bill to raise a $15,000,000 deficit in the state budget for the next two years. Governor Stephens signed the King bill the same day.

The new law will increase rates of taxation against numerous larger corporations. The tax rates of the utilities, for instance, will be increased by about one-third. The money thus realized, it has been explained by the State Board of Equalization, will be used to meet increased costs of state administration. Opponents of the bill held that the proposed increase in taxation could be avoided by resort to economies in the administration of public affairs. On March 7 one large light and power corporation made application for an increase in rates as the only means available to it for meeting the added tax burden.

In commenting on the passage of the King tax bill Governor Stephens said: "Thank God. The people have won a great victory. They still rule California."

Further consideration is to be given to economies suggested by the utilities' representatives while debating against the bill during the legislative sessions. Paul Shoup, vice-president of the Southern Pacific Company and president of the Pacific Electric Railway, was invited to address the assembly on what economies he could suggest toward reducing state expenses, and ex-Governor Frank K. Lowden of Illinois was to tell the California State Legislature how he reduced expenses in the conduct of the affairs of Illinois. Max Thelan, formerly president of the California State Railroad Commission, will also address the legislators on possible reductions in the proposed $81,000,000 budget for the next two years.

Mr. Thelen proved to the Legislature that $8,000,000 could be saved without cutting anyone's salary, dismissing any employees of the state, or abolishing any of the state's commissions or agencies. He held the floor on several occasions during the debate on the King tax bill and offered to show the legislators and the Governor that such a saving could take place.

Attorney General Webb has said that the measure may not be legal. This opinion is shared by many prominent lawyers and the measure may be attacked in the courts.

The proposed legislation was reviewed in the ELECTRIC RAILWAY JOURNAL for March 5, page 464. It was stated at that time that public service corporations considered the bill an unfair measure as they were already taxed more in proportion to value than other property. The utilities also advanced the plea that additional taxation would force them to advance their rates in order to show earnings which would attract capital.

$86 Profit in Seattle in January

According to the report prepared by the Seattle Municipal Railway officials the number of passengers riding on Seattle's Municipal Street Railway in January—in which month increased fares went into effect—decreased 897,299 compared with the month of December. The total number of fares for the month was 6,625,924, as against 7,523,233 in December. This was a decrease of 11.9 per cent.

Operating under the 8⅓ cent fare, the Municipal Railway in January showed a net gain of $12,783, despite the marked slump in passenger traffic. This net profit includes all interest charges and $56,719 depreciation. Further economies were put into effect in January. The payroll was trimmed, service was reduced and other operating costs were cut.

The total expenses for wages and operation were $376,216 in January. Interest charges and depreciation further increased this total to $505,553. Revenues were $518,337, leaving a gain of $12,783 without deducting a month's bond redemption charge. With this charge allowed there was a net gain of $88.64. Revenues increased $35,842 over December, and operating expenses decreased $16,152.

Present Value Theory Rejected

Texas Court Rejects Special Master's Finding—Galveston Value Fixed at $1,500,000

The Galveston (Texas) Electric Company has lost its fight for a 6-cent fare. In the United States Court for the Southern District of Texas, Judge J. C. Hutcheson, sitting at Houston, has handed down an opinion refusing to enjoin the city of Galveston from enforcing its ordinance directing the company to discontinue collection of 6 cents from street car patrons and to collect the old fare of 5 cents. In rendering his decision, Judge Hutcheson ruled contrary to the finding of Judge Henry J. Dannenbaum, master in chancery.

THE court gives two basic principles upon which it holds that rate controversies rest:

1. The principle which adheres in sovereignty.
2. The provisions of the fourteenth amendment, which guarantees equal protection of the laws and which inhibits the deprivations of property without due process of law.

Some of the salient points of the court's written order follow:

Both parties agreed that the property ought to have cost $1,715,825 on the basis of prices prevailing at the time it and its various units were constructed. The company contended that this value should be appreciated by a sufficient percentage factor to make the agreed value actually conform to present-day value of the plant. The city contended that the agreed value should have been taken as the basis of the value for rate-making purposes of the depreciable property, less a reasonable and adequate deduction for accrued depreciation.

The view of the master is adopted that the prices obtaining at the time of the valuation were transitory.

The master's allowance of $530,000 for development cost or going concern is disallowed, because:

> A court in a rate case has nothing to do with any increment to the actual value of the plant by the successful operation of it, nor in a case of valuation, where the cost of the plant and its historical development is determined, does the court add anything to its capitalization for rate-making purposes for its unsuccessful years, nor deduct anything for its successful years. In short, when going concern is stripped of its involvement and obscurity, its attractive names and titles, it presents itself on the one hand as good will, or an effort to capitalize errors and misfortune.

The statement that ". . . the constitution guarantees it (the plaintiff) a fair return upon the value of its property" is denied with the assertion that the constitution protects against legislation which would deprive the company of the right to charge rates adequate to produce a fair rate of return. Says the court:

> It certainly can not be that the courts intended, in declaring that the rights to a fair return could not be abridged, to create a more favored class out of public utility concerns, so as to allow them to receive their 8 per cent free of income tax while all other persons in the vicinity who receive the same per cent have to pay it.

From the agreed historical reproduction cost of the property actually in service of $1,715,825, disallowing the grade raising, brokerage and engineering costs, the court takes the base value of the property as $1,573.544. To the base value 33⅓ per cent of depreciable items is added, deducting $282,000 for the item of working cost, real estate and additions to the property since Jan. 1, 1915, the value of the depreciable items on the basis of historical reproduction cost is set by the court at $1,291,325.

Appreciating these items as the master did by 33⅓ per cent or $430,441, the court reaches a total of the present-day value of depreciable items of $1,721,766. Then restoring the items aggregating $282,000 the undepreciated value of the plant is given by the court as $2,013,985, which closely approximates that of the master which was $2,167,805. Deducting the accrued depreciation of $520,000, adding nothing for going concern, the court values the plant at $1,493,985, for rate-making purposes. The net return of $73,082 on the $1,500,000 valuation is approximately 5 per cent, and less than the law regards as fair.

However, the court finds that for the last six months since June 30, 1920, the property has been producing revenue at the rate of $618,000 per annum, as against the return of $548,477, which the master took as the basis of his report, and unless properly chargeable operating costs and maintenance have increased the earnings will be adequate to save the ordinance from the confiscation charge, for deducting the ascertained total of expenses, including the depreciation allowance, namely $475,395, from the estimated operating total of the fiscal year ending June 30, 1921, there is a net revenue of $142,605, or approximately 9½ per cent of the valuation.

The Galveston Electric Company sought an injunction against an ordinance passed by the Board of City Commissioners in 1919. The previous city administration permitted the company to charge 6 cents, effective Sept. 19, 1918. The present city administration, through ordinance, reduced this to 5 cents, effective June 5, 1919, so that the 6-cent fare was in effect less than four months. With the filing of the suit came the naming of the master in chancery, Henry J. Dannenbaum, who recommended that the rate of return was "insufficient and confiscatory." The master found that for the year ended June 30, 1920, the company earned 1.86 per cent on the value of the plant, but the court shows an earning of 9½ per cent on a valuation of $1,500,000, instead of the suggested valuation of $2,167,805.

Mitten Management, Inc., Organized

Mitten Management, Inc., has been chartered to engage in the business of managing, or acting as managers, of the affairs and operations of public utilities. The corporation is also authorized to carry on the business of consulting, industrial and contracting engineering in all its branches, including the construction, organization, operation and management of industrial plants and other business undertakings.

The personnel of the organization is as follows: President, Thomas E. Mitten; vice-presidents, C. J. Joyce, W. C. Dunbar, G. A. Richardson, P. J. Mitten and H. G. Tulley; secretary and treasurer, A. G. Mitten; assistant secretary and treasurer, R. F. Tyson. The directors are T. E. Mitten, C. J. Joyce, W. C. Dunbar, G. A. Richardson, P. J. Mitten, H. G. Tulley, and A. A. Mitten.

Mitten Management, Inc., whose offices are at 1520 Spruce Street, Philadelphia, last month closed a contract whereby it undertakes the management of the entire city and interurban railway properties of the International Railway, Buffalo, N. Y.

Security Holders Accept Reorganization Plan

The plan for the reorganization of the traction properties at Providence, R. I., into the United Electric Railways has been accepted by the bondholders of the United Traction, Rhode Island Suburban, Pawtuxet Valley and Cumberland Street Railways and by the United Traction stockholders.

Under the plan those security holders who have never deposited their stock or bonds with their protective committees have a further period, up to March 20, during which they may come into the reorganization by depositing their securities with the proper depositary.

The next step in the reorganization will probably be for the joint reorganization committee to declare the reorganization plan and agreement adopted and in operation. Steps will then be taken, it is understood, to press foreclosure proceedings on the various properties.

The terms of the proposed reorganization were reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 19, page 381.

$1,305,553 Earned by Iowa Interurbans

The forty-second annual report of the Board of Railroad Commissioners of Iowa contains statistics for the year ended Dec. 31, 1918. The status of the interurban companies, capitalized at $77,640 per mile, for the above period follows:

	1918	1917
Number of companies........	14	14
Mileage—single track........	512.13	510.69
Gross earnings from operation	$5,408,175	$4,096,597
Operating expenses..........	4,102,622	2,707,527
Net earnings from operation..	1,305,553	1,389,070

Financial News Notes

Sale of Real Estate Postponed Again.—The sale of the New York (N.Y.) Railways real estate under the orders of the court according to the provisions of the first real estate and refunding mortgage has been adjourned until April 6.

Electric Line Removed.—The structure of the Babylon (L. I.) Railroad is being removed and shortly there will be no trace of this Long Island electric line which extended from Amityville to Babylon. The road suspended service on May 15.

Change in Name Announced.—Announcement has been made that the Public Utilities Company, Evansville, Ind., has changed its name to the Southern Indiana Gas & Electric Company. The company operates 68 miles of electric railway.

Threat of Suspension at Middletown.—Officials of the Wallkill Traction Company, Middletown, N. Y., have threatened to "scrap" the railway and stop operations unless relieved of paying for repaving the streets between its tracks. The company has suggested that the city of Middletown obtain an enabling act to relieve it of this expense, which it protests it cannot afford.

$6,154 Loss in Month on Tacoma Line.—In the January report issued by City Comptroller John M. Roberts of Tacoma, Wash., the operating revenue of the Tacoma (Wash.) Municipal Railway is given as $9,139, some $2,000 less than receipts last year, largely due to reduced working forces of tide-flat industries. Operating expenses, including a $2,000 depreciation charge and insurance charges, were $11,839, leaving an operating deficit of $2,700. Interest on bonds, tax charges and other items of $3,397 bring the total deficit to $6,154. The deficit for the four years of operation now amounts to $166,522, which includes depreciation and other charges.

Successor Company Being Formed.—The Northern Rhode Island Railway, Providence, R. I., is being formed for the purpose of acquiring the Chepachet branch of the Providence & Danielson Railway. This branch has not been operated for a number of months. It is the purpose of the new company to lease its plant for operation to the United Electric Railways. The Chepachet line has always been dependent for its power upon the Narragansett Electric Lighting Company. In the bill to incorporate the new company there is a section giving to it the power to manufacture power for its own use and for sale to private consumers in the towns of North Providence, Johnston, Smithfield, Gloucester and Burrillville.

Approval of Refunding Sought.—Expenditures of $421,900 for improvements of the gas, electric and railway utilities at Evansville within the next two years is planned by the Public Service Corporation, according to company officials who appeared before the Public Service Commission recently. The commission was asked to authorize the sale of $1,736,300 of securities to refund maturing obligations and to meet proposed expenditures. Officials predicted the securities would have to be sold at 80 cents on the dollar. The bonds would bear 6 per cent interest and mature in 1929.

Springfield Has Surplus.—Clark V. Wood, president of the Springfield (Mass.) Street Railway recently reported on the company's showing for 1920. Travel was very heavy as evidenced by an increase of 6,000,000 passengers carried over the previous year. The equipment of the company was increased by the addition of twenty new one-man cars and additional trackage laid. As for the revenue of the company Mr. Wood states that an advance has been made over 1919, the early months of the year before the business depression was felt, showing the best increases. The mild winter and lack of heavy snowstorms saved the railway heavy expense.

Bill Reported for Successor Company.—The committee on railroads of the Connecticut Legislature has reported favorably on a bill incorporating the Eastern Connecticut Railway to purchase all the present line of railway now owned by the Shore Line Electric Railway through Norwich, Preston, Ledyard, North Stonington and Stonington to the Connecticut-Rhode Island line at the Pawtucket River and connecting with the tracks of the New York, New Haven & Hartford Railroad company at Brewster's Neck. The capital of the company is $50,000 with the right to increase to $500,000. The incorporators are: Robert W. Perkins, Norwich; Edward M. Day, Hartford, and Charles B. Whittlesey, New London.

Cincinnati Conferences Being Arranged.—Preliminaries are being arranged for the conferences to be held by the Ohio Traction Company and the Cincinnati Street Railway in connection with the refinancing and possible reorganization of the properties as requested in a letter to the companies from Williams C. Culkins, street railway director. The Ohio Traction Company, holding company of the Cincinnati Traction Company, has appointed a committee consisting of Louis J. Hauck, C. J. Livingood and Walter A. Draper, with W. Kesley Schoepf as ex officio member. The Cincinnati Street Railway has appointed a committee consisting of C. W. Dupuis, George Lewis and B. L. Kilgour, ex officio. The committees will have their first conference on the return to the city of W. K. Schoepf, president of the Cincinnati Traction Company, who is in the East.

Traffic and Transportation

More Five-Cent Zones

Many Brooklyn Riders Now Paying Two or More Fares Under Old Franchise Grants

The zone system is to be applied to nine more surface lines operated by Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company. This means that approximately two-thirds of the 150,000 passengers carried daily by these lines will pay 10 cents for a ride instead of 5 cents.

COMMISSION'S VIEWS EXPLAINED

Authority for this action has been obtained by Mr. Garrison by a decision of Public Service Commissioner Alfred M. Barrett that he would not extend the order suspending the new tariffs filed by the surface line companies. The order expired at midnight on March 12. A long statement, explaining Mr. Barrett's position, was made public. This says that the action of the commissioner is based on the recent decision of the Court of Appeals which sustained the contention of the Brooklyn City Railroad that it had the right to charge a double fare for through riders on the Flatbush Avenue line, and the success of other trolley companies in similar litigation. On this point Mr. Barrett said:

> The effect of these decisions was to leave the Public Service Commission without power to increase rates and in certain cases without power to prevent a company from itself increasing them.

RECEIVER INSISTS ON ZONE PLAN

That Receiver Garrison intended to insist upon his right to establish the zone system on the surface lines under his control was made clear in an argument before Federal Judge Mayer on Feb. 14. It was indicated at that time that the old city of Brooklyn would constitute one fare zone and that each one of the towns which now compose the city would constitute an additional fare zone.

The new schedules were filed by Mr. Garrison on Dec. 14 last and later they were suspended by an order of the commission until Jan. 12 and then until March 12. In the meantime, the commission held many public hearings, the result of which, according to Commissioner Barrett, was to prove "conclusively that the companies were all losing money at the present rate of fare, and their legal representatives stated on the record that unless they were allowed to charge additional fares upon the zone system they would be compelled to close down the operation of the lines."

Justice Manning of the Supreme Court in Brooklyn refused on March 15 to issue an injunction to the city restraining Lindley M. Garrison, as receiver of the four surface line companies of the Brooklyn Rapid Transit system, from putting into effect immediately the double fare charge authorized by Mr. Barrett. Instead, he issued an order requiring Mr. Garrison to show cause, at 2 o'clock on March 18, why the injunction should not be issued.

Ten-Cent Fare on Interurban

Passengers riding on interurban cars within the city of Cleveland, Ohio, began paying 10-cent fares on Dec. 26, 1920, with 1 cent additional for transfer to any intersecting city lines except where the right of free transfer is stipulated in suburban grant. This fare is the result of the action taken on Dec. 8 by the Cleveland City Council in adopting a resolution designating the cars of the Cleveland & Eastern Traction Company, the Cleveland & Chagrin Falls Railway, the Cleveland Southwestern & Columbus Railway, the Lake Shore Electric Railway, and the Northern Ohio Traction & Light Company as special cars and express passenger cars.

The right to do this is contained in section 23 of the renewal grant of April 7, 1919, authorizing the company to operate express passenger service and other special cars at rates to be fixed from time to time by the Council of the city of Cleveland not lower than the rate in force in the city.

Under the terms of the contract made with the interurban railways in November, 1897, to continue for twenty-five years, the Cleveland Railway is entitled to collect and retain (except in two cases where a division is made with the interurban companies) all of the fares collected by it on the interurban cars in its territory; it pays the wages of the crews while the cars are under its control, and it pays the interurban companies 2 cents for each mile run by their cars on its tracks. Under these contracts the company will receive all of the 10-cent fares except in the two cases mentioned, in which a division must still be made with the two interurban companies.

The Cleveland Railway does not anticipate that this legislation will increase the number of riders, although it may increase the amount of revenue. Passengers coming to the city may leave the cars of the interurban company at the junction of the tracks of those companies with the tracks of the Cleveland company and ride in on the city cars at whatever rate of fare may be in effect. The same is true on outbound trips, when passengers may ride to the limits of the urban fare before boarding the interurban cars.

The report of the railway for the year ended recently is reviewed elsewhere in this issue.

Eight Cents in Denver

Court Holds City Broke Franchise Contract by Allowing Temporary Six-Cent Fare

Patrons of the Denver (Col.) Tramway commenced paying an 8-cent fare on March 15. Metal tickets are sold in quantities of two or multiples thereof at the rate of 7½ cents each. The half-fare rate for children between the ages of six and twelve was increased to 4 cents with metal tickets sold in quantities of four and multiples thereof at 4¾ cents each.

The higher rates of fare were announced by Receiver Stenger under a decree issued by Judge Robert E. Lewis of the United States District Court, District of Colorado, wherein the 6-cent fare was held to be confiscatory and the city of Denver was enjoined from enforcing the collection of same and from interfering with the collection by the receiver of the higher rates.

The fare increase action is the result of proceedings instituted by Mr. Stenger on Feb. 11, at which time application was made to the court for permission to increase the adult fare rate from 6 cents to 10 cents and the children's rate from 3 cents to 5 cents. The case came up for hearing on March 1 and following the closing arguments on March 10 Judge Lewis immediately rendered his opinion granting the receiver permission to increase the fares. The Judge declared that it was not within his power to set the rate of fare to be charged, but that Mr. Stenger in his capacity as an officer of the court has the right to raise fares. The court allowed, however, that it would restrain Mr. Stenger to what it considered a reasonable figure and established 8 cents as the maximum fare which could be charged at this time.

FRANCHISE WAS NEVER A CITY CONTRACT

Judge Lewis, in rendering his opinion, stated that he did not think the tramway franchise ever constituted a contract with the city. Of one thing he was certain and that was that if there ever was a contract between the city and the company the existence of same came to an end when the city in the exercise of its governmental powers passed an initiated ordinance for a 6-cent fare and thereby changed the rate of fare from the rate contained in the franchise.

Application by the city of Denver for a stay of execution pending appeal was denied. The City Attorney thereupon gave notice that the case would immediately be appealed to the United States Circuit Court of Appeals. Pending final decision receipt slips showing rate of fare paid will be issued.

Judge Lewis, in signing the decree on March 12, declared that the city charter provisions under which the city of Denver regulates public utility rates by initiated ordinance are unconstitutional because they deny due process of law.

More Five-Cent Fares

Boston Elevated Reduces Fare 50 per Cent on all Main Surface Routes from Everett Station

The Boston (Mass.) Elevated Railway plans to establish a new system of fares on March 26 on all surface routes operating in the cities of Malden and Everett. Heretofore fares have been 10 cents with free transfers at all intersections to connecting routes.

LOCAL FARES FIVE CENTS

Under the new plan all local fares will be 5 cents, and transfers heretofore issued will be eliminated except to shuttle cars that will be operated on parts of two routes that formerly ran through to Everett station.

The fare to Boston and other points reached from the rapid transit lines will still be 10 cents with universal transfers as heretofore.

Seven routes will be operated to the Everett elevated station. Shuttle cars will take the place of two former through routes and service on the end of another will be discontinued.

Under this system the pay-leave plan will be operated on inbound trips to Everett station. Passengers leaving cars before reaching that point will pay 5 cents and all those entering the station will pay 10 cents the same as if they entered the station from the street. Passengers originating on shuttle cars will use a valued continuation ticket either in full or part in payment of fare.

Passengers on outbound trips boarding cars in Everett station pay nothing for fare on the surface lines. Passengers, however, boarding cars on the street pay 5 cents on boarding the car. Continuation tickets are issued by conductors when the passengers leave the car at the two junctions from which shuttle cars operate.

During the night when elevated trains are not in operation surface cars will run through to Sullivan Square or Boston. On these cars 10-cent fares will be charged to all passengers at the time of boarding. The fares to Everett station cars will be the same during the twenty-four hours of the day.

TRUSTEES WILL MAKE REPORT

In spite of the fact that the trustees are proceeding with the establishment of 5-cent fare lines as indicated above when short riding occurs or may in the opinion of the management be developed, the Massachusetts Legislature has seen fit to take a hand in the problem and has passed a resolve directing the trustees to investigate and report on the advisability of establishing a 5-cent fare on certain lines operating from Dorchester and South Boston localities into the business section of Boston where a 10-cent fare is now charged.

During the course of the debate, the act under which the trustee method of control was established in 1918 was bitterly attacked, and charges were made that certain members of the Legislature then in session profited by purchase of Boston Elevated stock just before the act was passed. Numerous amendments were offered in an attempt to include other localities in the proposed investigation, but were all defeated. It was claimed that the trustees had ample authority for making such an investigation without the necessity for specific legislative enactment, but nevertheless the bill was passed by a large majority. A report is required on or before April 15.

The trustees have already established two 5-cent fare lines, one operating in from South Boston and the other from Charlestown.

Six-Cent Fare Asked in Indianapolis

Company Claims One-Cent Transfer Charges Insufficient to Meet Increased Expenses

A 6-cent fare and a 2-cent transfer charge, with provision for the sale of twenty tickets for $1, were asked in a petition for an emergency increase in rates filed by the Indianapolis Street Railway with the Public Service Commission on March 14. The present fare is 5 cents, with a 1-cent transfer charge and no provision for the sale of tickets at a reduced rate.

The petition states that the 1-cent transfer charge, which has been in effect since Dec. 20, 1920, is insufficient to meet the increased operating costs and fixed charges of the company, which caused a petition for emergency relief last fall. Due to a decrease in the number of revenue passengers since Dec. 20, 1920, the company will face a cash deficit of more than $300,000 on May 1, without providing for betterments or improvements, the petition states.

The 1-cent transfer charge, which was originally established for an observation period of seventy-one days, was continued by the commission recently, pending further consideration of the case. In connection with the present petition, the company submitted a detailed financial statement, showing the revenues obtained under the operation of the 1-cent transfer charge and indicating the financial situation of the company.

Samuel Ashby, city corporation counsel, said that the petition was filed without the knowledge of city officials. He pointed out that the company was to have made a report on March 1 on the revenues accruing from the 1-cent transfer charge, but that upon the request of the railway the Public Service Commission later granted the company until April 1 to make the report.

The Indianapolis Street Railway is still operating under its city franchise. Under the terms of the Knapp law, which permits utilities to surrender their franchises and operate on an independent permit under the jurisdiction of the Public Service Commission, the company may abandon its franchise. This action cannot be taken until the 1921 statutes are published. The Knapp law contained no emergency clause.

Louisville Injunction Argued

Hearing in that City on March 17 on the Plea of the City Against Present Seven-Cent Fare

The United States District Court of Appeals set March 17 as the date for hearing the appeal case of the city of Louisville on the injunction granted the Louisville Railway to prevent collection of a 7-cent fare. A motion will also be filed by the city to require the railway to issue receipts pending final settlement of the case.

March 17 was set following the plea made on March 9 by J. S. Lawton, city attorney of Louisville, before the Cincinnati court. Churchill Humphrey, of the company, asked for an April assignment of the case, to give more time to working up material.

One of the first questions to be decided is whether the franchises under which the company is operating are contractual or regulatory.

There have been a good many jitneys on the streets in Louisville as a result of the 7-cent fare. Licenses are being issued to jitneys under the taxi ordinance instead of the jitney law. This results in some of them operating without even a surety bond. Many jitney operators are poor drivers, and accidents have been increasing at an alarming rate.

INCREASED FARES NOT REFLECTED IN REVENUES

Although the increase from 5 cents to 7 cents in fares in Louisville should figure about 40 per cent, actual increased revenues are only about 18.4 per cent according to company officials, due to loss of short hauls and competition from the jitney bus.

The Kentucky Railroad Commission has authorized the Louisville & Interurban Railway, owned by the Louisville Railway, to increase interurban fares 2 cents, to bring the haul within Louisville up to the city rate of 7 cents. Those who buy present commutation books will not be affected. The rate outside of the city remains at about 3 cents a mile.

The Louisville Railway has flatly refused to consider the suggestion of City Attorney Lawton that receipts be issued with 7-cent fares, so that refunds may be made in the event that the upper courts give an opinion against the company. The proposal was that each ticket strip contain a receipt, so that only buyers of strips would get receipts.

New Transfer System in Los Angeles

A new transfer to simplify the present system and speed up the loading of cars is to be introduced by the Los Angeles Railway April 3, according to an announcement made by G. J. Kuhrts, general manager. The new plan is expected to be of special benefit in traffic distribution as it will give car riders a wider choice of transfer points than exists at present, thus reducing the number of people boarding cars at busy intersections.

The new transfer will have a coupon attached. When presented on the second car the conductor will receive the transfer as at present, but if the passenger wants another transfer the receiving conductor will detach the coupon and return the body of the slip to the passenger and this slip will be good for the third ride. This plan will not affect passengers on shuttle cars as shuttle lines are considered as continuations of the main line with which they connect. A special type of transfer will be used for shuttle cars so a passenger will be entitled to full transfer privileges after boarding the main line car.

Different colors will designate whether the transfer was issued on an "in" or "out" trip.

Cars south and west bound through the business district will be designated as on the "in" trip and "out" trip will be north and west through the downtown zone. Three o'clock p.m. will be the dividing point between "a.m." and "p.m."

LOADING OF CARS WILL BE SPEEDED

When the new transfer is introduced April 3 it will not be necessary for a passenger to state the direction in which he wishes to travel on the second ride. He will merely say "transfer" to the conductor and will receive a slip.

Transfers will be good on connecting or diverging lines except at points specified on the back of the transfer. Under the wider choice of transfer points a passenger may board the second car at any point where it crosses, enters, or diverges from the line on which he paid the fare. Under the present system one point is designated and change from one line to another must be made at that one point only.

Through Railway-Omnibus Routing in London

The London County Council has decided to enter into an agreement with the London General Omnibus Company for through bookings between the tramcars and the omnibuses. In principle this applies to all the tramway dead-ends in the central area, but as an experiment it is only at first to be tried at the tramway terminus at Victoria Station for twelve months. The through tickets between car and bus or *vice versa* will not apply to workmen's fares nor to the cheap midday fares. The company is, however, prepared to provide early morning omnibuses to connect with the workmen's cars run by the Council. That any step should be taken between the two big rival undertakings to promote co-ordination of traffic is noteworthy, because the County Council has hitherto stood aloof in proud isolation from the company.

The new scheme may be regarded as the outcome of two things. Some months ago, at the instigation of the Minister of Transport, conferences were begun between representatives of the two bodies with the object of traffic co-ordination. Then in the autumn, when a committee of the House of Lords rejected a scheme of the County Council for powers to run omnibuses to link up the tramway dead-ends in central London, the committee suggested that the omnibus company might provide these services. It recommended negotiation on the subject. The first fruits are now apparent.

Transportation News Notes

Ten Cents in Vancouver.—The Public Service Commission of Washington has given permission to the North Coast Power Company, which operates the railway line in Vancouver, Wash., to increase fares to 10 cents. Eleven tickets will be sold for $1. The old rate was 7 cents.

Protests Interurban Rise.—Protests against increasing the fare on the Daisy interurban from 7 cents to 10 cents were heard recently at New Albany, Ind., by a special examiner of the Interstate Commerce Commission. The Daisy line is operated by the Louisville & Northern Railway & Lighting Company.

Increased Rates in Effect.—The Trenton, Bristol & Philadelphia Street Railway has been granted permission by the Public Service Commission of Pennsylvania to increase its fares from 7 to 8 cents between Morrisville, Trenton and Torresdale and intermediate stations. Special car rates are also advanced.

Jitneys Succumb Under Regulation.—New jitney regulations put into effect at Providence, R. I., on March 1 resulted in 127 operators of these vehicles withdrawing from service. The conditions under which the jitneys have been permitted to run were tightened as one of the steps in securing the reorganization of the electric railways in Providence.

Jitney Regulatory Bill Passed by House.—The Connecticut House has passed a measure providing for regulation by the Public Utilities Commission of all jitneys, subjecting them to supervision as to routes and rates similar to that under which electric railways are operated. The measure requires buses to be provided with certificates from the commission which correspond to the franchises of the street car companies.

New Rate in Effect.—The Seattle-Everett Interurban Railway, Seattle, has recently put into effect a new rate schedule which effects an increase of 3 to 4 cents in fares between Seattle and intermediate points, but does not affect the one-way or round-trip fare to Everett. The fifty-ride monthly ticket sold to Everett commuters is abolished and a thirty-ride ticket substituted. Commutation fares are not increased for the stations near Everett.

Ten-Cent Fare in St. John.—A 10-cent cash fare went into effect on the lines of the New Brunswick Power Company operating in St. John, N. B., on Jan. 10. Tickets are sold three for 25 cents, or fourteen for $1. There is no additional charge for transfers. F. R. Ross, president of the company, following a meeting of directors, said that he hoped the new rates would reestablish the standing of the company's securities so that it could secure new capital for improvements.

Jersey Jitney Decision Appealed.—The Public Service Railway, Newark, N. J., has filed in the Court of Errors and Appeals an appeal from the Court of Chancery decision which held that the jitneys have rights in streets occupied by electric railways. The public Service Railway has thirty-six suits pending to restrain the jitneys of various municipalities from operating on streets in which the company has franchises, and the suit started a few days ago carried with it indirectly a decision that will rule each of these cases.

Akron Council Again Petitioned.—The Northern Ohio Traction & Light Company, Akron, Ohio, has again petitioned the City Council for permission to increase its fares. The company was granted a 5-cent fare in July, 1920, pending the drafting of a new franchise. The city and the company have been unable to agree upon the terms of a proposed new contract. The company in its letter to the Council states that in three months the income has failed to meet the actual operating expenses by $96,837. The company further adds that the situation, which was serious six months ago, has now become grave, and in order to continue service material increases will be required.

Fake Claim Operator Caught.—On Jan. 23 a conductor on one of the Public Service Railway lines operating in Camden, N. J., reported that a negro giving the name of Charles Gotdenues had slipped and fallen in a car. At the hospital the man said he was a fireman employed on the White Star Line. On the following day he presented a claim at the division claim office. The suspicions of the claim department were aroused and fraudulent records looked up. Therein appeared a notice from the Claim Agents' Association under date of November, 1917, warning of one Victor Lamott, alias several other names, colored. After further investigation a warrant was issued against this Public Service Railway claimant and he was arrested on a charge of attempting to obtain money under false pretences. He admitted that he had made claims against the Philadelphia & Reading road in Philadelphia, the Pennsylvania at Harrisburg, Pa., and at the Thirty-fourth Street Terminal, New York, the latter on Jan. 8 last. He was tried as Frank Smith and sentenced to six months in the Camden County jail.

Personal Mention

Workers Pledge Pay

Men Under B.ll Boyce Respond with Loans to Meet Railway's Interest Payment

Few men in any walk of life have had any greater tribute paid to them by their employees than has W. H. Boyce, general manager of the Beaver Valley Traction Company, New Brighton, Pa. Men there are who have received from their employees sincere tokens of esteem in the form of gifts of a personal nature or other memorials purchased through subscription, but Mr. Boyce has recently had his men put their personal funds at the disposal of the railway itself.

TEN DOLLARS FROM EACH EMPLOYEE

To meet the deficit each employee of the companies of which Mr. Boyce is operating head has agreed to loan the sum of $10 from his semi-monthly pay on the first of four such payments, the total of which, with reduction of expenses, is expected to meet the immediate pressing obligations of the Beaver Valley Traction Company and Pittsburgh & Beaver Street Railway.

Mr. Boyce, at three department meetings of the employees, explained the exact financial condition of the traction interests and the response was spontaneously unanimous. Mr. Boyce gave an estimate of the probable deficit for March of $4,441, and with a probable shortage, with all obligations met, by the last of April, of $27,441, but that by deferring certain payments the shortage the last of April, which it would be necessary to make up in some manner, would be $7,716.

It was declared that if each employee who is able would lend the company $10 per pay for the next four pays, or $40 each, it would be possible to meet the situation for the next two months. Employees making the loans were assured that they would not only be given a receipt showing the payments but would receive interest at the rate of 6 per cent when the money was paid back during the months of June or July. Several offers were made of amounts from $80 to $1,000.

183 VOLUNTEERS

Mr. Boyce has long had the reputation of being one of the ablest handlers of men in electric railway work. This vote of confidence in him, one of the very first of its kind, bears witness to the correctness of this estimate. Out of 187 employees, 183 volunteered their pay, accepting Mr. Boyce's say so as a pledge for the return of their money. The four employees who were not able at that time to loan the amount requested said that financial troubles of their own prevented them from doing as they wished. However, in all four cases the individuals made known to Mr. Boyce their sincere intention of loaning the desired amount as soon as circumstances would permit.

Mr. Pattison to Work on Electrification of Illinois Road

Hugh Pattison, until recently connected with the heavy traction department of the Westinghouse Electric & Manufacturing Company, engaged in making special engineering studies under the direction of F. H. Shepard, has resigned to accept a position with the Illinois Central Railway, in connection with the electrification of that road. At one time Mr. Pattison was engineering assistant to Frank J. Sprague, vice-president and technical director of the Sprague Electric Company, in New York. This association continued until 1903, during which time Mr. Pattison assisted in equipping and operating multiple-unit control on the Boston elevated and Brooklyn railroads. In 1905 Mr. Pattison joined the Westinghouse, Church, Kerr & Company, as an engineer, and from that time until 1911, during the electrification of the Pennsylvania tunnel into New York, he was assistant engineer of the electric work for George Gibbs, consulting engineer.

A little later he had charge of the electrification of the West Jersey & Seashore Railroad from Camden to Atlantic City. An experimental single-phase electric railway on the Long Island Railroad was also built by him and numerous locomotive tests on the West Jersey & Seashore Railroad were carried out under his supervision. He was graduated from Johns Hopkins University, electrical engineering course, in 1892.

New Commissioners Named

Governor Edwards of New Jersey announced on March 14 that he would, in accordance with the provisions of Chapter 36 of the new public utility bill recently passed over his veto, submit to the Senate the following names of membership of the new board: James A. Hamill of Hudson, formerly Assemblyman and Congressman for twelve years, whose term only recently expired; Joseph S. Hoff of Mercer, former Civil Service Commissioner, president of the National Bank of Princeton and of the Princeton Savings Bank; Harry Bacharach, twice Mayor of Atlantic City, at present president of the Marine Trust and director in several other mercantile institutions.

Two of the men named are Democrats and the other is a Republican. The term of Commissioner Hamill will be for six years, Commissioner Hoff for four years and Commissioner Bacharach for two years. The new law provides salaries of $12,000 for each member. The new commission will be ready to function upon its confirmation by the Senate.

Mr. Haynes Retires

Member of Indiana Commission Resigns to Take Up Law Practice in Indianapolis

Paul P. Haynes of Anderson, Ind., a member of the Public Service Commission of Indiana, has resigned his position, effective March 31, it was reported among Mr. Haynes' friends. It also is understood that Governor McCray has offered the position on the commission to George M. Barnard of Newcastle, and that Mr. Barnard will accept the place.

HIS ATTITUDE TOWARD UTILITIES

Mr. Haynes is serving his second term as a member of the commission. His present term would not have expired for about three years, but his friends have understood since late last year that he would resign some time in March of this year and engage in public utility and law practice in Indianapolis, after several months of special work for certain corporations in Mexico. James P. Goodrich, then Governor, reappointed Mr. Haynes last year to another four-year term. He is the youngest person ever to serve on the board. Mr. Haynes and Mr. Barnard, both lawyers, have been prominent in Republican politics.

Mr. Haynes has made an enviable reputation in the public utility field, the electric railway field, especially, because of the fair and common-sense stand he has taken regarding the utilities. He clearly stated his attitude at the annual meeting of the Indiana Public Utility Association, which was reported in the ELECTRIC RAILWAY JOURNAL for Jan. 22. At that time Mr. Haynes said that the interests of the public utilities and of the public are so inextricably associated that what is good for the public is good for the utility and vice versa; that when one prospers or suffers the other does likewise.

COMMISSION MADE POPULAR

He laid stress on six points which stated the whole utility question in a nutshell. These have been taken up and quoted widely in the industry as the things that must be brought home to the public before relief from the present dilemma can be gained. Some of the principal points made by Mr. Haynes why rates should not yet be reduced were that utility rates have not paralleled other prices during the period of inflation, that utilities, having earned less than a fair return on their fair valuation, should be permitted to recoup their losses, and that there is an immense amount of deferred maintenance to be taken care of.

Mr. Haynes contended that it is the duty of a commission to see that the utilities are not only solvent but that they are maintained in a healthy condition. As a member of the commission he has done much to promote this view and his influence has deservedly had results in placing the commission in its correct relation with the public and the utilties.

Retires After Thirty-six Years with United Railways

Patrick Callaghan, foreman of the Fourth Division of the United Railway, St. Louis, Mo., has resigned after completing thirty-six years of service. The friends of the retiring foreman, numbering every man connected with the South Broadway station, arranged a surprise party to honor Mr. Callaghan. An elegant morris chair, purchased by voluntary contributions from all his fellow workers, was presented to Mr. Callaghan and a fund was unanimously pledged to buy his smoking tobacco for life.

Among those who spoke, paying tribute to the veteran foreman, was H. O. Butler, superintendent of transportation, who warmly congratulated Mr. Callaghan and mentioned his splendid record of service. He told the trainmen that he hardly knew the company had a Fourth Division, because both accidents and complaints were few, and he was very glad to compliment the trainmen on their efficient work.

D. F. Trotter, division superintendent, although it had not been his good fortune to have known Mr. Callaghan for the last quarter of a century as had some, said that during the year that he had known him their relations had been most agreeable. He added that it would be the trainmen who would suffer the greatest loss, because they were the ones who had received both his advice and counsel, which has been so freely and kindly given.

Manager Butler Discusses Atlanta's Railways

"Atlanta is plainly an up-to-date, splendid city with a traction system one of the very best." This is the opinion of F. L. Butler, new manager of the Georgia Railway & Power Company, Atlanta, Ga., and at one time manager of the Winnipeg Electric Railway, Canada. The new manager, assuming office on Feb. 7 last, delivered a diplomatic message in which he assured Americans of Canada's friendship for the United States. He compared Winnipeg to Atlanta, saying that they are alike in size and in the details of traffic. Mr. Butler made the following comments:

> The rapid transit service of a city is one of the most important industries it has. A good transportation system is the backbone of a city's life. The visitor to a city surveys its street car service as the first means of judging the city. The city government should regard the transit condition as one of the most important matters of welfare to the city and its people.
>
> Investors studying a new town with the idea of locating there have to consider the street car service as the subject of first importance in deciding them. The question is more important to such an investor than the question of real estate values. In fact real estate values are largely based on the railway service the real estate possesses.

Mr. Harris Elected

Superintendent of San Francisco-Oakland Terminal Railways Becomes President of Pacific Railway Club

At a meeting in Oakland, Cal., on March 10 the Pacific Railway Club elected as its president for the ensuing year G. H. Harris, general superintendent of the San Francisco-Oakland Terminal Railways, Oakland, Cal. F. S. Foote, professor of railroad engineering, University of California, was elected first vice-president. Mr. Harris, in becoming president of the Pacific Railway Club, succeeds Dennistoun Wood.

An experience of over thirty years as a railway operator on various roads makes Mr. Harris well qualified to fulfill the duties as president of the club. Mr. Harris is a graduate in civil engineering and has been connected with the engineering departments of the Chattanooga, Rome & Columbia Railway; Briarfield, Blockton & Birmingham Railway; Southern Railway; Alabama, Georgia & Florida Railroad, and the Georgia, Midland & Gulf Railroad. He left the employ of the last company in 1890 to superintend the conversion of the Birmingham system from mule power to electricity. At the completion of the reconstruction he became master mechanic, in which capacity he served until about 1902, when the office of superintendent of traffic was created. Mr. Harris was chosen to fill that position and continued as superintendent of traffic until 1904, when he was appointed manager of the railway department of the company. His title was subsequently changed to superintendent of the railway department.

G. H. HARRIS

In 1914 Mr. Harris became general superintendent of the San Francisco-Oakland Terminal Railways, in which position he had general charge of the transportation and maintenance departments. Since that time his responsibilities have been increased by the taking over of direct personal charge of several departments. Upon the resignation of A. W. MacPherson, chief engineer, Mr. Harris assumed active charge of all maintenance-of-way and structures work. Other branches of the work directly under his charge are the electrical and mechanical departments. In recent years he has devoted more and more of his time to maintenance matters and is now the active head of all maintenance and operation for the company.

New Publications

Connecting Induction Motors.

By A. M. Dudly, engineering department, Westinghouse Electric & Manufacturing Company. 252 pages, cloth, 6 x 9 in., illustrated. McGraw-Hill Book Company, New York, N. Y.

In view of the widespread use of the induction motor, this presentation, from a practical standpoint, of the details of winding and connecting motors of this type is of timely interest and value both to students and to operating engineers.

Powdered Coal as a Fuel

By C. F. Herington. Second Edition. 388 pages, 124 illustrations. D. Van Nostrand Company, New York.

Coincident with the rise in price of coal, more attention and study have been directed toward the efficient burning of cheap fuels. By powdering, coals high in ash content can effectively be used. The author of this book has made extended studies in his subject in foreign countries where, perhaps, the methods and economies possible have been thoroughly investigated. He points out that the efficiency, flexibility and elimination of banking losses by the use of powdered coal under boilers indicate it to be a most promising fuel. Among others, he cites the power plant of the Milwaukee Electric Railway & Light Company as one successfully operated on pulverized fuel.

Financial Engineering

A text for consulting, managing and designing engineers and for students. By O. B. Goldman, consulting engineer and professor of heat engineering Oregon State Agricultural College. 271 pages, illustrated. John Wiley & Sons, Inc., New York City.

The complaint is often made, sometimes justly, that the engineer is more interested in his engineering than in the financial results of what he engineers. This criticism is less deserved now than formerly; in fact, a considerable part of engineering today consists in appraisals and the like, bringing the engineer in close contact with one phase of finance. The engineer will appreciate a book like this one by Professor Goldman, who has applied engineering principles in finance. He has carried engineering problems farther than usual, to the point of determining, not only the question "What will it do?" but also "Will it pay to do it?" He uses a term "restance" as a complete measure of what a service costs in the long run, defining this as "the equivalent cost of a permanent service." This quantity is used throughout. While somewhat mathematical in spots the book is not complicated. It is illustrated with numerous examples and graphs.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Safety Car Price Reduced

The National Safety Car & Equipment Company, St. Louis, Mo., has announced a reduction in the price of the standard safety car to $6,500 for a double-end car purchased on a cash basis. This new lower price has been made possible by the reduction in the cost of various equipment. The announcement also includes a plan for the purchase of new cars on the equipment trust basis or on a leasing basis.

Fiber Conduit Buying Not Very Strong

Stocks at Mills Are Capable of Handling Immediate Shipments and Production Is Continuing

Unlike usual buying conditions in the fiber-conduit field at this time of year, the present market is quite dull. Manufacturers at the same time have built up large stocks of this material to handle business which is expected to come in later in the spring and summer with request for quick delivery. No difficulty can be experienced now in shipping common sizes from stock. To continue this condition the mills as a whole are working virtually full time.

To be sure, some orders have been taken for good amounts for spring delivery, and the early break-up of winter is providing an added incentive to purchase at this time. Many power stations have plans ready for heavy extensions, but these are being held in abeyance till a later time. Certain parts of the Southwest, West and Central States have been in the market, with some amounts coming from the East.

In line with prices of other commodities, at least one mill has reduced its price in an amount ranging from 15 to 18 per cent. Up to date no other instances of a price drop have been found.

Rail Mills Have Fair Capacity Booked

Steam Roads Have Taken Good Capacity for First Half Year—Foreign Steel Prices Lowered

Rail orders from steam roads are in pretty fair volume in the rolling mills. This is particularly so for first half year mill capacity, although there is still some capacity for that period which can be booked. Girder and high T rails likewise are reported to have a fair schedule ahead. Much of the rail buying to date was done in December and has been for shipment in specific months, some running into the second half. There is little for quick delivery, and generally speaking it would be with difficulty that even as low as thirty-day shipments could be made.

The Treasury Department has some money available for equipment needs but this will be relatively small compared with the roads' needs. Still there are some large orders reported about ready to be placed for spikes, quotations on which is given as 3.65 cents.

In the foreign market the Danish railways are reported in the market for about 6,000 tons of rails, 11,000 fish plates and 150,000 sole plates. A contract is said to have been awarded to Krupps of Germany for 10,000 laminated steel car wheels for the Argentine State Railway. Chilean State railways are looking for tenders on steel rails and accessories in an amount estimated at $1,500,000. At the same time English, Scotch, Belgian and German steel mills have made recent cuts in their steel prices in an endeavor to get export trade.

Copper Sells at 12 Cents

Still Little of the Metal Is Changing Hands—Government Sells Scrap Brass

The copper market is down to a level lower than it has been at any time since 1914. In the outside market, sales in relatively small amounts are being made at 12 cents a pound, refinery. The sales at this figure are necessarily small because it is felt any considerable attempt to purchase in large lots would react for a rise in price. Buying interest is indeed light. This is to be expected under the low rate of production now carried on by electrical manufacturers. Only a few of the producers are willing to come close to these bottom figures, with a price of 12.25 cents, delivered, for spot. Most producers, though, are still holding for 12.75 to 13 cents, delivered, for the first half year.

Announcement has been made by the Government that it has sold 30,000,000 pounds of its 47,000,000 pounds of brass cartridge cases which have been offered several times. The Chase Companies, Inc., Waterbury, the Scovill Manufacturing Company, Waterbury, and the Bridgeport Brass Company, Bridgeport, Conn., each took 10,000,000 pounds. The price is a percentage of the market prices to be adjusted monthly. This probably will have a retarding effect on the scrap copper and brass market, which is now on a very quiet level.

Line Hardware Stocks in Good Supply

Utilities and Railways Not Covering for Spring Needs, Although Buying Is Expected to Pick Up in April

A survey of the pole-line hardware market reveals the fact that utilities are not anticipating their spring needs. Some business has been placed, but the market on the whole is quiet. Restricted buying power with both power companies and electric railways is largely blamed by manufacturers for the light demand. It is expected, however, that by the end of next month sales should have picked up considerably.

Producers are continuing production of hardware, though in some cases reserve supplies are not large. One company, in fact, reports being still as long as three to four weeks behind in its line hardware department. In general, however, stocks are more than ample for present needs, and on reasonable size orders consumers may count on stock to one-week shipments.

Prices have not changed since general reductions of from 5 to 7½ per cent were put into effect by leading manufacturers about the middle of February. This is the second general cut that has occurred, as decreases of from 5 to 15 per cent were made during December and early January. In some quarters the view is heard that present quotations have about reached bottom. Prices quoted by a representative producer f.o.b. Chicago are as follows: Carriage bolts, ⅜ in. x 4½ in., $2.31 per 100; crossarm braces, 1¼ in. x ¼ in. x 28 in., $14.42 per 100; lag screws, ½ in. x 4 in., $4.02 per 100; machine bolts, ⅝ in. x 12 in., $10.65 per 100. New York prices are about 20 per cent higher than the above to allow for freight and warehouse charges.

Funding of Car Company Planned

Plans were submitted to the bondholders and stockholders of the Barney & Smith Car Company, Dayton, Ohio, by the directors on March 9 which call for funding the notes and current liabilities and financing the working capital requirements of the company through an issue of $2,000,000 second mortgage 7 per cent bonds. Under the plan of the directors, which is approved by the stockholders' committee, all indebtedness would be funded, the receivership lifted and working capital provided.

At this time, it was pointed out, when conditions indicate a profitable resumption of business the company finds itself having a valuable plant, but being without working capital. Since the plant cannot be sold under foreclosure at anything near its value, the only alternative is for the bondholders and stockholders to provide working capital, so that it can be put to its only proper use. The property is subject to foreclosure on and after April 1, 1921, and to prevent this action the plan must be agreed to promptly.

A meeting of the directors will be held in Cincinnati on March 24, at which time the plans will be accepted or rejected. The directors of the company are C. H. Rembold, manager of the Cincinnati *Times-Star;* Attorney Lawrence Maxwell, Cincinnati; H. W. Lothmann, T. C. Simpson, Claude V. Black, E. E. Werk and E. F. Kimmel.

Advantageous Time to Cover Coal Needs

Favorable Prices, Good Deliveries and Possibility of Future Car Shortage —Calder Coal Bill Dies

Inactivity continues to feature the coal market. Consumers for the most part are apparently confident of filling their future coal needs easily enough, hence buying on the part of railroads, public utilities, etc., is for current needs only. On the other hand there is a belief among a considerable part of the coal industry that there is another period of car shortage and high prices on the way. Credence is lent to this belief by the increasing number of inquiries for contract quotations by consumers who are figuring on their year's needs.

According to the March 17 issue of *Coal Age* prices of bituminous coal, having followed an irregular downward curve ever since the middle of last August, are now about as low as can be expected, both for spot and contract delivery. Therefore the present would seem to be an advantageous time for utilities to protect themselves by not only contracting ahead for a good grade of coal at a reasonable price, but also by putting the greater portion of this coal supply in stock within the next few months.

Production, which has steadily declined from the middle of last December, is considered to have about reached bottom now. Total output up to March 5 for the present coal year ending April 1 is placed at 497,818,000 tons by the United States Geological Survey. This compares with 447,900,000 tons a year ago, when the interruption of production by the great strike drew so heavily on reserve stocks. It is more significant that the present yearly output is over 13,000,000 tons behind 1917-18, a year when requirements were large and output about equaled consumption.

In connection with the present coal situation it might be well to note that the Calder coal bill, which originally aimed at federal regulation of the coal industry, died a natural death through the ending of the Sixty-sixth Congress on March 4. The bill as reported to the Senate was so amended that it bore little resemblance to the original draft, the provisions providing for publicity of information concerning the coal trade being virtually the only ones to remain.

Rolling Stock

Kentucky Utilities Company, Somerset, Ky., has purchased two standard safety cars from the National Safety Car & Equipment Company, St. Louis, Mo.

Boston (Mass.) Elevated Railway Company announces that it has decided to call for bids on ten one-man cars to replace rolling stock that was lost in the Amory Street carhouse fire on March 4.

The Detroit (Mich.) Municipal Railway has called for bids on 100 Peter Witt single-end, double-truck, center-exit cars with a seating capacity of fifty-six passengers. Bids will be opened on March 25.

Franchises

Monongahela Valley Traction Company, Fairmont, W. Va.—A meeting was recently held in Marietta, Ohio, in connection with a new franchise grant to the Monongahela Valley Traction Company which must be passed upon before April 7.

Indiana Service Corporation, Fort Wayne, Ind.—The Indiana Service Corporation is planning to double-track Pontiac Street, from Calhoun Street to Anthony Boulevard, a distance of about ten or twelve blocks. The franchise for the double tracks on this street has been approved by the Board of Public Works, and will be sent to the council for ratification. A large number of Pontiac Street residents have announced their intention of protesting the proposed double-track improvement.

Portland, Ore.—Multnomah County Commissioners have granted a conditional twenty-five-year franchise to J. B. Schaefer and other residents of Linnton for the construction and maintenance of a railway between Nicolai Street and Linnton, along the St. Helens Road. Under the county franchise, which becomes effective on April 6, a 10-cent fare may be charged. The permission is not complete without the consent of the city commissioners to operate such a line within the city limits. The franchise provides for the payment of 5 per cent of the net income from the operation of the railway to the county. A track running to Oilton, about three miles from Linnton, all electrified, is now owned by Hill interests, on which cars were formerly operated. It is stated that this line can be secured, and that about $60,000 would be required to complete the proposed line from Nicolai Street to Linnton.

Power Houses, Shops and Buildings

Northern Ohio Traction & Light Company, Akron, Ohio.—The Northern Ohio Traction & Light Company has built a new substation in Massillon in which are installed two 500-kw. rotary converters.

The Swiss Federal Railways, it is reported from Berne, will require the expenditure of 200,000,000 francs in its electrification. The report continues that the Federal Council is negotiating with American bankers for a respective loan.

Columbus, Delaware & Marion Electric Company, Columbus, Ohio.—In an effort to relieve the acute power shortage in the vicinity of Marion, Ohio, the Columbus, Delaware & Marion Electric Company is constructing a modern electric generating plant at Scioto. Although 10,000 hp. is being installed provision has been made for doubling the capacity without building additional structures. Power needs of industrial and manufacturing plants will be taken care of in this plant.

Kansas City (Mo.) Railways.—The Kansas City Railways, which has been supplying some current in the downtown area for the Kansas City Power & Light Company, will relinquish this service in a few weeks. The light company has been using a decreasing amount of current, as it has put into service more and more of its own new equipment, and it will soon be ready to handle all its own current supply, necessary changes in distribution elements being about completed. When the service to the light company is discontinued changes are to be made in the railway's power plant, both in equipment and in operation. The company will continue to sell current to certain interurbans.

Track and Roadway

Connecticut Company, New Haven, Conn.—Paving improvements in the city of New Haven are awaiting track repairs by the Connecticut Company. Director Lane has stated that the city will go ahead with the work as soon as new ties and rails replace the worn-out equipment.

Miami Beach Electric Company, Miami Beach, Fla.—The Miami Beach Electric Company expects in the near future to build three new turnouts.

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—Improvements contemplating an expenditure of approximately $600,000 will be made at the Terre Haute, Ind., power plant of the Terre Haute, Indianapolis & Eastern Traction Company. The Indiana Public Service Commission recently granted to the local utilities company an increase in lighting and power rates in Terre Haute and along with the increase an order was entered directing the company to make certain changes intended to improve the service. The work to be done includes an addition to the power plant and the installation of additional equipment. Increase in power production, extension of service lines and placing of wires underground are among the items to be included in the improvement plan as now contemplated by the company.

Boston, Mass.—The Boston Transit Department has submitted to the Legislature a plan for the extension of the Boylston Street subway to Postoffice Square. The new subway as planned will do two things: It will give Boston a central, easily accessible gateway which will handle commuters, and will avoid congestion at the Park Street subway station.

Michigan Railroad, Jackson, Mich.—A resolution has been adopted by the City Commission of Battle Creek that the Michigan Railroad should extend its Garfield line, which now reaches Central Street, along such stresses as is necessary to connect the line with the Maple Street line terminus. It is said that this part of the city is without suitable car accommodations. The commission will soon consider the proposed extension.

Trade Notes

The Mar-Sla Manufacturing Company, Youngstown, Ohio, recently organized and with a plant at Hubbard, Ohio, will deal in chemically treated switchboards.

The Dayton Mechanical Tie Company, Dayton, Ohio, has appointed J. J. Costello, 201 Devonshire Street, Boston, Mass., its representative in the New England states.

The Packard Electric Company, Warren, Ohio, manufacturer of transformers, has moved into its new quarters in the Printers' Crafts Building, 461 Eighth Avenue at Thirty-fourth Street, New York City. J. E. Erickson, manager for the New York district, is in charge.

The Jeffrey Manufacturing Company, Columbus, Ohio, manufacturer of electric locomotives, elevating, conveying and crushing machinery, announces the removal of its Denver (Col.) office from the First National Bank Building to 421 United States National Bank Building.

Stuckeman Brothers, 18 Ruth Street, Pittsburgh, Pa., manufacturer of small motor-driven air compressors and other specialties, has recently been incorporated with a capital stock of $50,000, in order to facilitate expansion along other lines. W. F. Stuckeman is president.

Mitchell-Rand Manufacturing Company, 18 Vesey Street, New York, is distributing in the New York territory ebony asbestos wood for switches, panels and bases manufactured by Johns-Manville, Inc. A good assortment of stock will be carried in the company's warehouse to insure quick deliveries.

The Conveyors' Corporation of America, Chicago, Ill., announces that the Power Equipment Company, 131 State Street, Boston, has been appointed New England representative for its American trolley carrier and its monorail equipment for handling coal, ashes, etc., Colwell & McMullin, 79 Milk Street, Boston, are New England representative for the company's American steam ash conveyor.

W. W. Joy has joined the forces of the Advance Machinery and Supply Company, Denver, Col., as vice-president and sales manager. Mr. Joy, who is a graduate of Ames College, Iowa, and a member of the A. S. M. E., for the past three years has been special sales promotion representative for the Fisher-Governor Company, Marshalltown, Iowa. The Advance Machinery and Supply Company is sales representative for twenty-three manufacturers of steam and electrical specialties.

The Equitable Equipment Company has just been formed for the purpose of handling second-hand locomotives, cars, railway equipment, rails and rail accessories, machinery, etc. The new company, with offices at 411 Whitney-Central Building, New Orleans, La., is taking over the equipment, rail and machinery business of A. Marx & Sons, Southern Scrap Material Company and the Ship Supply Company. The firm will be under the direct management of O. D. Cleveland, who has been manager of the New Orleans branch of the General Equipment Company.

George Oliver Smith has recently joined the American Atmos Corporation, Pittsburgh, Pa., manufacturer of oxygen resuscitation and breathing apparatus, as vice-president and chief engineer. Mr. Smith comes to his new position from Henry L. Dougherty & Company as Supervisor of Safety. He organized the accident prevention department of that organization in 1913, and has since then had executive charge of all the accident prevention, as well as special sanitation and welfare activities of the company. Mr. Smith's first position was with J. J. White & Company, Inc., with whom he was associated for five years as junior engineer.

Osborne E. Quinton, treasurer of Holden & White, Inc., has resigned to become vice-president of the Central Hyde Park Bank of Chicago. Mr. Quinton's first connection with the electric railway field was as general representative of the Peter Smith Heater Company, of which concern he later became vice-president and general manager. In 1918 he severed this connection and with Walter E. Hinman took over the sale of the Jewel hot-blast stoves for electric railway use, produced by the Detroit Stove Works, together with some other specialties. In the spring of 1919 the firm of Hinman & Quinton was consolidated with Holden & White, Inc., and Mr. Quinton was elected secretary and treasurer of the latter company. When this company was sold to the National Railway Appliance Company in the fall of 1919 he was elected treasurer of Holden & White, which continued in operation in conjunction with the holding company. He held this office actively until Holden & White was recently absorbed by the Hegeman Castle Corporation. Mr. Quinton retains approximately a one-fifth interest in the National Railway Appliance Company, of which he is a director. He will also continue as vice-president of the Burry Railway Supply Company, manufacturer and distributor of Hartman center bearings, Perry side bearings and Peerless side bearings.

New Advertising Literature

Feed Water Filter. — The Griscom-Russell Company, 90 West Street, New York City, has issued bulletin No. 615 describing the G-R Multiscreen Filter.

Electric Buffer.—The U. S. Electrical Manufacturing Company, Los Angeles, has recently developed a new heavy-duty Johnson electric buffer.

Lubrication.—Lubrication of Steam Turbines, Part I, is the substance of the February issue of *Lubrication*, published by The Texas Company, New York City.

Bond and Signal Wire.—Copper Clad Steel Company, Rankin, Pa., has issued two folders covering "Copperweld" wire for signal service and "Copperweld" bond wires.

Tools.—The Goodell-Pratt Company, Greenfield, Mass., is distributing its "No. 14 Tool Book," in which it describes and illustrates over 2,000 sizes and kinds of tools.

Power Plants.—E. W. Clark & Company Management Corporation, Columbus, Ohio, has issued Booklet A, dealing with unit power plants and offering a plan for preliminary engineering recommendations.

Electric Equipment for Movable Bridges. — "Electrical Equipments for Movable Highway and Railway Bridges" is the title of bulletin No. 48034 issued by General Electric Company.

Battery-Charging Equipment. — The Automatic Electrical Devices Company, 120 West Third Street, Cincinnati, has issued bulletin 620, illustrating its various types of fixed resistance charging panels for industrial trucks and locomotive service. Bulletin 621 covers its "Unipanels," sectional battery-charging equipment for charging industrial trucks, storage-battery locomotives, and electric commercial vehicles.

Storage Batteries.—The Gould Storage Battery Company, 30 East Forty-second Street, New York City, has issued bulletin L-2, describing types L-149-A and L-149-B of Gould storage batteries for mining and industrial locomotives. Catalog V-7 covers its electric vehicle types of storage batteries with "Dreadnaught" plates. The company is also distributing two booklets giving instructions on the care and operation of the Gould locomotive batteries and Gould batteries in mine locomotives.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, March 26, 1921 *Number* 13

New York Association Enthuses Over Trolley Freight Business Prospects

THE quarterly meeting of the New York Electric Railway Association, held in New York City on March 25, was considered by those in attendance to have been one of the most successful conferences held by the association in recent years. The program was short, it was prepared on short notice and brevity was the feature of the papers and contributions to the discussions. The amount of information brought out, however, was large, and it all related directly to the questions under discussion, *i.e.*, valuations, taxes, safety cars and freight and express business.

Possibly that part of the discussion which was of the widest application related to the merchandising methods used in the selling of freight and express service. The testimony was unanimous in showing the desirability of this service when its quality is good and its virtues are duly advertised. The discussion further showed that time will favor greatly the development of this business, because the operators of motor trucks are now finding out that it is unprofitable to compete with the rail lines over very long distances. The steam railroads will likewise soon reach the same conclusion with respect to extremely short distances. Electric railway service will therefore predominate between the limits of radius of operation which are set by economic considerations. The delay in settling down to an equitable division of the field has been due simply to the failure of both the truck owners and the steam railroads to realize the true economics of the freight haulage business, as well as to the partial failure of the electric railways in the past to go after their legitimate share of the business with the conviction and vim that are necessary to the greatest success.

Swapping Experiences Regarding Equipment Maintenance

IN ALL classes of work there is much satisfaction and considerable value to be obtained through discussion with others intimately connected with the same line of work. For this purpose the movement to form associations of master mechanics and equipment engineers in sections which do not extend over too great an area is very commendable. A noteworthy example of such an organization which has been in operation since March, 1918, is that of the Association of Electric Railway Men with members located in a radius of about 150 miles from Pittsburgh. The territory covered by this association extends north to Cleveland, Ohio, east to Johnstown, Pa., south to Clarksburg, W. Va., and west to Columbus, Ohio. Much benefit has been obtained from the round-table discussions which have taken place at this association's meetings and the railway men have been brought closer together by the exchange of ideas, thus tending toward the betterment of operation and the reduction of equipment maintenance costs in general.

Among the men who benefit most by affiliation with such an organization as this are those who have not been able to get to the national conventions, due to the expense involved and to the time necessary for making the trip where properties are located at a considerable distance from the place where the conventions are held. By the arranging of local associations in districts of not too great an area, this objection is overcome. It is understood that at the present time the forming of associations is contemplated or they are in the process of being formed in the South near Louisville, Ky., and in central New York. This movement should spread and it can do so without in any way detracting from the work of the Engineering Association, but rather the reverse. Representatives of the various standing committees can obtain a large fund of information and many valuable ideas from the experiences of the men actually doing the work, and there is nothing like a round-table discussion of a few intimate associates to bring out the good and bad points of equipment and to devise means which will satisfactorily overcome the troubles.

Three-Wire System for Electrolysis Mitigation in Winnipeg

THE Winnipeg Electric Railway is making what is probably to date the largest single contribution of experimental information on the use of the three-wire system in controlling electric railway return current. After careful investigation the railway adopted this means as the most practicable one for meeting the rather rigid specifications laid down by the city fathers. The railway's complete scheme involves some changes in the substation layout and the distribution system, but the three-wire arrangement is mainly depended upon to reduce potentials and potential gradients in the track to conform to the specifications prescribed by the city.

In order to prepare itself to meet the municipal specifications the railway company nearly three years ago engaged a railway man of long experience, W. N. Smith, as resident consulting engineer, to make an exhaustive study of the whole proposition. The result was a firm conviction on his part that the three-wire system would "fill the bill." As soon as this conclusion was reached, plans were made to apply it, and much interesting research work was done. The story of the progress made to date is given by Mr. Smith in this issue of the paper. The publication this week is timely because on April 1 the city expects the problem to have been solved and will presumably proceed to check up the work done by the railway company. From the data given in the present article it would appear that the test will be met in a satisfactory manner.

The three-wire system has been used from time to time on a larger or a smaller scale, the most ambitious undertaking on direct-current railways being that of the Pacific Electric Railway. In an article in the issue of this paper for Feb. 26, 1916, S. H. Anderson, electrical superintendent of the Pacific Electric, gave the results of a year's experience with the plan on 125 miles of track. He made this significant statement: "There is nothing that can be accomplished in the matter of electrolysis mitigation by the use of an insulated negative feeder system which cannot also be accomplished by a three-wire system of distribution." In an article in the March 16, 1918, issue, Charles R. Harte, construction engineer the Connecticut Company, said: "As a means of reducing high potential gradients the change to the three-wire system is much less costly than a new substation or additional insulated negative feeder returns. There is, however, as yet not enough evidence available to say how much of the benefit is offset by the operating complications." The experience in Winnipeg will be of great value to the industry in verifying Mr. Johnson's conclusions, based on experience, and in supplying the lack mentioned by Mr. Harte.

Efficiency and Courtesy Will Strengthen Employees' Position

"THE day of sloppy work, violations of rules and insolence to public and employers is past." This is quoted from an editorial in an official publication of organized labor and it shows that at least some of the union workmen are thinking seriously of the future. Workmen are reminded in the editorial that the war is over, that the day of unwarranted strikes is gone, that immigration and lessened production have turned the advantage to the employers' side. In other words, a plentiful supply of labor has put an end to official leniency and tolerance of the past few years. Men are to be hired more carefully and held to a strict accounting for observance of rules.

Strikes are no cure for unemployment. The cool-headed trade union officials and representatives of Great Britain realized this a few weeks ago when they rejected a proposal for a general strike. The steam railroads are facing a situation of this kind, and the great packing house interests have been defied by the unions in their plans to go back to pre-war working conditions. A few electric railway companies have already reduced wages of trainmen and others have announced their intention to do likewise. The coming months are likely to bring a labor crisis on some of the larger properties.

Employees everywhere should ponder well over the circumstances before they take radical action. A "lost" strike may be the undoing of a union, as it was in Kansas City and several other notable instances. It will at least mean sacrifice of wages for an indefinite period, and it is well to consider that a lowered wage is better than none at all. Similarly it is better to forego some working conditions than to lose a job. We know of one company where concessions to the men in the form of shorter working hours and additional bonus time made it necessary to add several thousand trainmen to the force in order to keep the same number of cars in service. This, of course, added materially to the cost of transportation.

Wages were advanced throughout the country during the past few years because cost of living increased and because in some cases platform men were not to be had except by tempting offers. It was the old situation of supply and demand getting closer together. Now conditions have changed. All reports agree that cost of living is on the downward path. It is to be expected that wages also will have to go down.

The public soon will be looking for lower carfares. Its hopes will be realized only if costs of operation are reduced. Employees will not be making a popular move if they refuse to recognize the new status of affairs. Meanwhile they may strengthen their position by efficient and courteous service.

Some Exact Knowledge of Automatic Substation Operation

THE industry is greatly indebted to Charles H. Jones and the Chicago, North Shore & Milwaukee Railroad for the study and record of automatic substation operation which appear elsewhere in this issue. There has been an accumulating faith in the reliability of the automatic control, but it has been based on the absence of trouble without full knowledge of the service which the control was called upon to handle. Mr. Jones' scheme of checking up on the automatic stations has developed two things: a startling revelation of the large number of complete operations performed, and the remarkably low number of failures per given number of operations. For the five stations on which data were collected, 100,608 complete operations were accompanied by only 119 failures, or 1.18 failures per thousand operations, including a station where a defective brush-lifting device caused an abnormally high number of failures. Omitting this station, which involved only 7 per cent of the total number of operations covered by the study, although 40 per cent of the failures occurred there, the number of failures per thousand operations for the remaining four substations was 0.78. This gives a clear exposition of the ruggedness and reliability of the automatic equipment, for it is probable that the average operator in a manually controlled station will make more than one failure per thousand operations in starting up a station, synchronizing and throwing in on the line.

Chief among the advantages apparent from Mr. Jones' study is that to be derived from the interspacing of substations on existing railways, a plan made economically possible by the absence of need for an operator. Nearly all interurban roads are now laid out on a plan of grouping two or more rotaries in each substation. If some of these machines were installed in new stations located at points midway between existing stations, considerable improvement in the trolley voltage, and hence the service, and marked reduction in power losses would result. The possibilities here are so important as to deserve the immediate attention of nearly every railway system. This is substantially the procedure which was followed on the North Shore line, for of the six machines automatically controlled, four are old ones removed from existing stations.

The fact that the individual old converter will in many instances be of capacity too small to handle by itself the total load of a train starting in its immediate vicinity is not a controlling factor, for the use of the load-limiting resistance enables the machine to remain on the line and carry only a normal overload. This ability to carry a greater load per unit is demonstrated by the experience on the North Shore line, where an increase in converter type of 52.6 per cent has made it possible to handle approximately one hundred per cent increase in total power produced. This was made possible largely through the interspacing of stations, which in turn was made feasible by the automatic. Detail estimates which have been made of the savings available through distributing the existing machines along the line in accordance with present day railway power engineering show that the total cost of the change can be written off in from one and a half to two years.

Aside from bringing out prominently the considerations already mentioned, Mr. Jones' contribution to the industry satisfies in a way the curiosity felt by most power men as to what is going on between inspections in the attendantless substation. There is the further gratifying finding that the wear on contacts and other parts of the control equipment is extremely small, indicating long life and low maintenance cost.

Wage Reductions and Fares

NOW that many of the electric railways, like other industries, are contemplating the reduction of wage scales as agreements expire, it is pertinent to consider what the relations are between wage reductions and fare reductions. Undoubtedly many people are under the impression that as so much of the cost of the carfare is labor, important reductions in electric railway fares may be expected contemporaneously with lower wages. But those responsible for the operation of the traction companies should be on their guard against leading the public to expect too much in the way of immediately lower fares.

In the first place it should be remembered that increases in carfares lagged considerably behind the original wage increases, and that even the 10-cent fares that now exist in some places are only double the old rates, while street railway wages are generally much more than double the rates of ten years ago.

Secondly, there seems to be little likelihood that the approaching reductions can bring wages back to anything like the old rates. It is only a few years since many companies paid rates in the neighborhood of 20 cents an hour. Does any one look for a return to these conditions in the near future?

Suppose a company puts into effect a wage scale approximately 20 per cent lower than the existing one. That would represent, say, a drop from 60 cents per hour to 48 cents. A sudden change of this amount would require a very great change in the family budget of the workman. Yet even were this done, how much fare reduction might be expected? Roughly speaking, payrolls of the average traction company will average about 50 per cent of the total revenue. To reduce the payroll 20 per cent might then permit of an equivalent reduction in revenue of 10 per cent. This would mean that a 10-cent fare might be reduced to 9 cents. A 7-cent fare reduced 10 per cent would be 6.3 cents. Some reductions may also be expected in the costs of materials, but interest rates have shown no tendency to come down, and where a company has had to refund during the last few years any considerable issues, the increase in interest rates is a serious one.

It is difficult to see where wage reductions of much more than 20 per cent can be looked for in the immediate future and the companies could well use any saving due to lower wage scales and lower costs of materials to build up a reasonable surplus fund, similar to the "barometer" funds of some of the service-at-cost plans. They could then better afford to experiment with reduced fares when intrenched in a stronger financial position than most of them now find themselves.

Quotation from the Federal Electric Railways Commission Report

No. 13

THE electric railway problems admit of a satisfactory solution once the elements that compose them are made known and the process of ordinary economic and business common sense is applied. The duty of both the public authorities and those who control the electric railway enterprises of the country is plainly indicated. The time has come for a permanent and satisfactory settlement of the traction question. The interests of both the public and the companies lie so exactly parallel in almost every respect that there ought not to be any serious difficulty in arriving at a solution if both parties approach the subject in a proper spirit.

A. R. E. A. Convention Reports Are Up to Usual Good Form

THE sterling character of the committee reports presented to the American Railway Engineering Association at the Chicago convention held last week are apparent to those who have taken the trouble to read them. The association is functioning true to form, and the committee work continues to be of a high order of excellence. In general the work which the association is doing is of untold value to the railway engineering profession and a reading of its committee reports cannot do otherwise than to inspire railroad men to greater efforts.

There is one feature of the association work which greatly enhances its value to the members. This is the publication of its committee reports in bulletin form so that most of them are in hand long before the convention; the members are thus given time to study the reports and prepare for discussion at the convention. It may not be out of place to suggest that similar publication of reports by the American Electric Railway Engineering Association would be worthy of consideration by the executive committee of the latter association.

The railway engineers continue to find difficulty in inducing a more general adoption of their standards and recommendations by the individual railroads, and a concerted effort is being made with the view of securing a wider use. The lack of interest displayed in the standards is in parallel with that found in the electric railway engineering field, where the individual members have also been loath to adopt the standards and recommendations promoted by the American Electric Railway Engineering Association. It is evident that both associations must continue their efforts toward "selling" their standards.

An abstract of some of the more important details of the committee reports will be given next week, but it will not be possible, in the space allowed, to go deeply into the numerous phases of railroad engineering which are covered by the twenty-three standing committees whose reports cover practically the entire range of railroad construction, operation and maintenance. The magnitude of the work accomplished by the association in the twenty-odd years of its existence is indicated by the fact that the 1921 edition of the Manual, which has not been completely revised since 1915, will contain approximately 1,000 pages. This will be a veritable encyclopedia of railroad engineering.

Electrolysis Mitigation in Winnipeg

Three-Wire System Has Been Applied to Bring Ground Return Conditions of the Winnipeg Electric Railway Into Conformity with "Electrolysis Act" Passed by the Legislature of the Province of Manitoba — Engineer Responsible for the Work Tells What Has Been Done to Date and Why

BY W. NELSON SMITH
Consulting Electrical Engineer Winnipeg (Man.) Electric Railway

FOR some years the corrosion of cast-iron water mains in Winnipeg has been a subject of controversy between the city administration and the Winnipeg Electric Railway, as potential differences existed in the railway tracks which permitted a leakage of stray current to underground structures. In 1914, at the request of the Manitoba Public Utilities Commission, which had been established two years previously, the late Prof. Albert Ganz of Hoboken, N. J., made a survey of conditions and reported on them in 1915. This report was summarized in a number of recommendations, establishing limits of track potential differences, calling for permanent means of observing them and favoring an additional substation and insulated negative return feeders on the old two-wire system. These, up to 1915, were the only methods considered practical for mitigating electrolysis conditions. The three-wire system had not then won the general recognition that it did a year or two later.

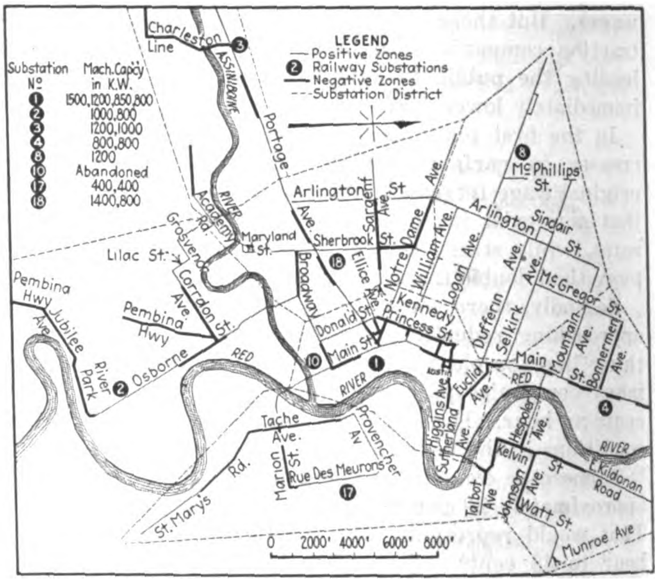
In view of the great capital expenditure and the extra loss in power and car speed incident to the two-wire return-feeder system Professor Ganz's report not only left the details of feeder distribution to the railway but expressed his recommendations so broadly as to make the use of the three-wire system possible.

PROVINCE PASSES "ELECTROLYSIS ACT"

In 1917 the company installed a couple of negative boosters with insulated track feeders at two of its substations. In the spring of 1918, as part of a contract between the railway and the city, which involved the abolition of jitneys by the city and the undertaking of various improvements by the company, the company agreed to follow the recommendations of Professor Ganz, as embodied in the "electrolysis act," which in the meantime had been passed by the Manitoba Legislature, making into law most of the Ganz recommendations with some modifications and omissions. The provisions of the act respecting electrical drainage of underground cables placed that matter under the jurisdiction of the commission. Drainage of gas and water pipes is forbidden by the act. This was the situation when the writer, in June, 1918, undertook the task of reducing the track potentials and gradients to within the prescribed legal limit.

An engineering study of the situation showed clearly that, due to the heavy cars in use and light weight of rails employed, the same amount of copper would go very much farther if used on the three-wire system of distribution than on the two-wire system of insulated negative return feeders. The latter, up to the time that Professor Ganz made his examination and report, had been regarded as the only available practical method of reducing track potentials and stray currents. The process of final adjustment in equalizing track potentials is also carried out more conveniently by the three-wire than by the two-wire system. In view of the financial situation at the time, these advantages of the three-wire system were too important to be disregarded, even though it involved a departure from previously establish standard ideas and methods.

The three-wire system was first worked out on a large practical scale in this country in the Los Angeles district in California in 1915 (after Professor Ganz made his report). It was so successful in reducing track potentials and gradients and in stopping the electrolysis troubles resulting from them that the United States Bureau of Standards had paid special attention to its application, not hesitating to recommend its adoption in other places, and had formulated the theory of applying the three-wire system in practice along lines that would be of greatest service in automatically protecting underground cables as well as water pipes.


LEGEND
— Positive Zones
❷ Railway Substations
— Negative Zones
--- Substation District
Substation No.
Mach. Capcy in K.W.
❶ 1500, 1200, 850, 800
❷ 1000, 800
❸ 1200, 1000
❹ 800, 800
❽ 1200
❿ Abandoned
⑰ 400, 400
⑱ 1400, 800
Charleston Line
ASSINIBOINE RIVER
Portage Ave.
Academy Rd.
Grosvenor
Maryland St.
Lilac St.
Corydon St.
Pembina Hwy
Jubilee Ave
River Park
Osborne
Arlington St
Sargent Ave.
Sherbrook St.
Notre Dame Ave.
William Ave.
Logan Ave.
Broadway
Ellice Ave
Kennedy
Princess St.
Donald St
Main St
McPhillips St.
Arlington St.
Sinclair St.
Dufferin Ave.
Selkirk Ave.
McGregor St.
Mountain Ave.
Bonnerman Ave.
Main St.
RED RIVER
Tache Ave.
Provencher Av
Marion St.
Rue Des Meurons
St. Mary's Rd.
Higgins Ave
Sutherland Ave.
Euclid Ave.
Hespeler Ave.
Kelvin St
E. Kildonan Road
Talbot Ave
Johnson Ave.
Watt St.
Munroe Ave
0 2000' 4000' 6000' 8000'

SKELETON MAP OF WINNIPEG, SHOWING ELECTRIC RAILWAY LINES, RAILWAY SUBSTATIONS AND THREE-WIRE ZONES

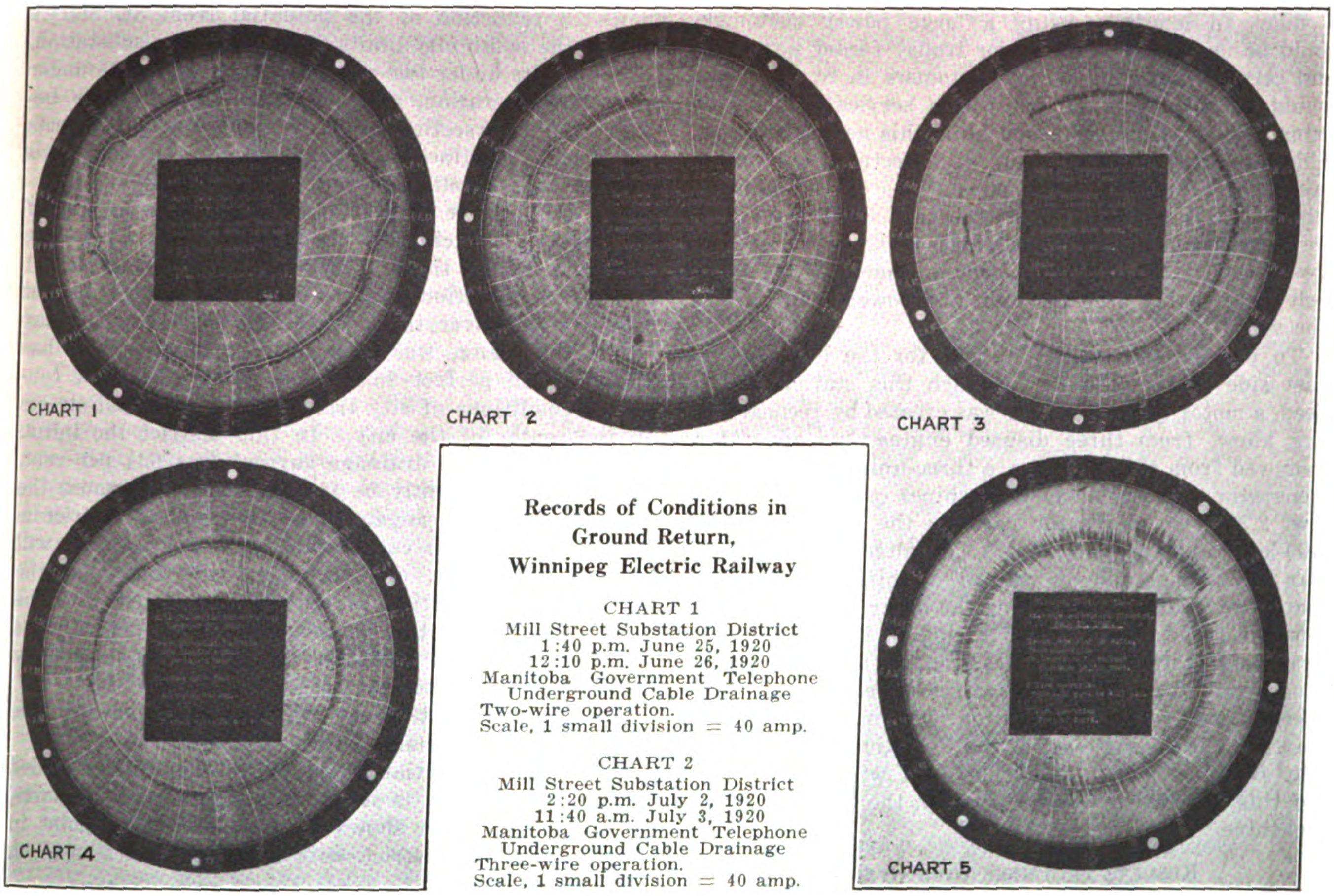
STATUS OF THE THREE-WIRE SYSTEM IN 1918

The "state of the art" in 1918 was very carefully investigated by the writer, who found that the three-wire system was then in successful operation in Brisbane, Australia; in the vicinity of Los Angeles, Cal.; in Omaha, Neb., and in Milwaukee, Wis., with installations projected for immediate use at Springfield, Mass., and Wilmington, Del., and recommended for New Orleans, La.

From the accumulated practical experience from various sources of first-hand engineering information, it appeared that the conditions of trolley distribution in

Winnipeg lent themselves readily to changing the system over from two-wire to three-wire operation. Besides the heavy cars in use and the light rails, the substation motor-generator units are of sizes available for balancing in three-wire operation with a minimum of rearrangement, and all permanent substations but one had at least two machines. The feeder distribution is nearly all overhead. The trolley lines were originally subdivided into very few sections, and this fact had given rise to more or less inconvenience at times of accidental breaks in the trolley system so that the operating staff rather welcomed the idea of sectioning the lines.

The paramount consideration was the reduction of track potentials and gradients to within the limits required by law, so it was regarded as a matter of minor importance whether the cars of certain lines were kept continuously on the same feeder and trolley sections or not. It is sometimes thought that it is unwise to take a chance of stalling the cars of some particular line at one part of their run, by reason of some electrical failure that affects one section but not the others, but as the Winnipeg car lines are not susceptible to a great degree of segregation in the center of the city this feature did not require special treatment, and after more than a year's operation in one district and some months' operation in two other districts, one of which is the central district of the city, there has developed no reason to revise the general arrangement of sectioning. Line failures are rare, and in extreme cases of emergency everything can be paralleled on the two-wire system, if necessary.



Records of Conditions in Ground Return, Winnipeg Electric Railway

CHART 1
Mill Street Substation District
1:40 p.m. June 25, 1920
12:10 p.m. June 26, 1920
Manitoba Government Telephone Underground Cable Drainage
Two-wire operation.
Scale, 1 small division = 40 amp.

CHART 2
Mill Street Substation District
2:20 p.m. July 2, 1920
11:40 a.m. July 3, 1920
Manitoba Government Telephone Underground Cable Drainage
Three-wire operation.
Scale, 1 small division = 40 amp.

CHART 3
Mill Street Substation District June 2, 1920
Track potential in volts from Higgins and Main to Portage and Main; distance 3,450 ft.
Two-wire operation.
Scale, 1 small division = 1 volt.

CHART 4
Mill Street Substation District Nov. 23, 1920
Track potential in volts from Higgins and Main to Portage and Main; distance 3,450 ft.
Three-wire operation.
Scale, 1 small division = 1 volt.

CHART 5
Fort Rouge Substation District June 19, 1920
Track potential in volts from substation to Grosvenor and Stafford; distance 10,350 ft.
Two-wire operation from 1:35 p.m. to 4:05 p.m.
Three-wire operation, rest of chart.

The general method adopted for three-wire operation is the so-called "sectional method," in which the alternate sections of any double-track or single-track line are of opposite polarity, progressively along the line.

The general method of sectioning followed is to set off three zones from each substation to the extremity of its feeding district, and to reverse the middle zone of the three. A number of variations have been made from this general standard to meet particular cases, but this general principle was the one adopted, it having been established by E. R. Shepard of the Bureau of Standards that this combination offers the lowest reduction of track potential combined with the tendency for stray currents in underground cables to flow continuously toward the substation, as compared with any other system of sectioning.

The Winnipeg Electric Railway's original system of substations and railway generating units, as arranged prior to 1918, was as follows:

No.	1	Mill street station	1—1,500-kw.	1—1,200 kw.	3—800 kw. M.G. sets
	2	Fort Rouge substation	1—1,000-kw.		
	3	St. James substation	1—1,200-kw.	1—1,000-kw.	
	4	North End substation	2— 800-kw.		
	8	Logan Ave. substation	1—1,200-kw.		
	10	Assiniboine substation	1—1,400-kw.		
		Total capacity	12,500-kw.		

It had been realized that any scheme for the mitigation of electrolysis would probably necessitate the utilization of every pound of feeder copper that could be made available from the entire railway and lighting system of the company. It had, therefore, been decided before the writer was retained that a new substation should be created in St. Boniface, east of the Red River, at a point contiguous to the right-of-way of the 60,000-volt transmission line over which power is transmitted from the hydro-electric power plant to the receiving station at Mill Street, for by so doing a heavy alternating current feeder of six 500,000-circ.mil cables, about 2 miles in length, serving a large power customer, could be nearly all salvaged for trolley feeder purposes, and certain important power customers in St. Boniface would be given very much better service. The first thing to do was to design and build this new substation. This was fitted up throughout with electrical equipment taken out of various other substations of the railway, where it was not working at full capacity. The transformer equipment comprised three 1,000 and three 800-kw., 60,000/2,200-volt transformers, much of the 2,200-volt power being used for light and power customers in the vicinity.

To provide the trolley current for the lines on the east side of the Red River which this station was to feed, a motor-generator unit was created by reconstructing anew, from three disused engine-type generators removed from their engines, a three-unit railway motor-generator. The component machines consist of an 800-kw. 2,200-volt alternator used as the motor and two 400-kw. railway generators. The alternator originally ran at 90 r.p.m. and the railway machines at 100 r.p.m., but it was found upon testing the latter that they would operate satisfactorily at 90 r.p.m., so this combination was decided upon, and the machine was designed, erected and operated as a three-unit, three-wire machine.. Thus three-wire trolley distribution was made possible in most of the district east of the Red River from the new St. Boniface substation. The load within easy reach of this substation was well within the capacity of this machine.

RESULTS IN THREE-WIRE OPERATION

The first demonstration of three-wire operation, however, was made in the district fed by the Fort Rouge substation. One of the 800-kw. machines was taken out of Mill Street substation and moved to Fort Rouge. The relatively small amount of change in the Fort Rouge switchboard was made during the winter of 1918-19; some 6 or 7 miles of feeder copper were transplanted into the Fort Rouge district, and the feeder system there rearranged, and on March 30, 1919, three-wire operation began in this district. It was successful from the start, although refined results were somewhat interfered with by the fact that the track potentials on the lines north of the Assiniboine River fed from stations No. 1 and No. 10 were exactly as they had been previously, and considerable return current going back to No. 10 station near Main Street from the district extending a mile or so to the west of it was shunted through the railway tracks across the bridges over the Assiniboine river. This changed the track potentials in the tracks in the Fort Rouge district from what they would have been had this shunting of track current been preventable.

Tests made in May, 1919, showed that the reduction of track potentials taken between the substation and the principal outlying points in the Fort Rouge district was from an average of 11 volts under two-wire operation to an average of 3 volts under three-wire operation, a reduction of 73 per cent.

THREE-WIRE DISTRIBUTION EXTENDED

These results were considered sufficiently good to warrant the extension of three-wire operation to the remainder of the system. On Oct. 1, 1919, the three-unit railway motor-generator at the new St. Boniface substation, above described, was placed in three-wire operation. The results in the St. Boniface district showed a reduction of the potential from St. Mary's road at the south city limits to St. Boniface substation, from 10 volts under two-wire operation to 4 volts under three-wire operation, and the potential difference between the intersection at Tache and Marions Streets and the St. Boniface substation, around the loop, was reduced from 5 volts to 1 volt.

The Mill Street substation, which is the largest of any, had its switchboard changed over for three-wire operation during the first half of 1920, and on July 1 three-wire operation was begun in the central district of the city. Everything tested out perfectly the day before the change was to be made, and the system has worked with perfect smoothness under the most congested conditions of city traffic on the principal streets in the center of the city. In this district the initial reduction in cable drainage current was 62½ per cent. This will subsequently be further reduced, because the present zoning arrangement of this central district is such as to cover a considerably larger area than will be the case later, on account of the fact that the Sherbrooke substation is not yet completed, and the Mill Street substation now has to carry not only its own territory but also that which will be ultimately carried by Sherbrooke.

The above reduction of stray current is shown in the pair of drainage charts here reproduced.

The track potential reduction in the heavily loaded Mill Street district is shown in a second pair of charts, while a fifth chart shows the reduction at a point in the Fort Rouge district, with a lighter load at a much greater distance.

In October, 1919, the writer submitted the complete plan for changing over the entire system to three-wire operation. This is shown on the map on page 584.

Among Professor Ganz's original recommendations in his 1915 report it had been suggested that a new substation should be constructed near the intersection of Portage Avenue and Sherbrooke Street, which is the center of a fairly heavy load. The significance of this recommendation lies in the fact that it is 3¼ miles from Mill Street substation No. 1 to the St. James substation No. 3, on the west city limits, and that the traffic on Portage Avenue is quite heavy, with an appreciable traffic also to be cared for on Sherbrooke Street and on Sargent and Notre Dame Avenues, the next adjacent lines on the north.

The Assiniboine substation No. 10, located on Main Street near the Assiniboine River Bridge, had originally been the site of the first steam power plant, and although the steam plant operation had been discontinued for a number of years, the building had still been continued as a source of electric railway distribution by installing a 1,400-kw. motor-generator in it. This condition meant that No. 1 and No. 10 substations together, they not being very far apart, fed a large district for about a mile west of Main Street, and all the return current naturally had to flow back east toward Main Street, making a fairly heavy pitch or gradient of track potential all the way down Broadway, Portage Avenue, Sargent Avenue, and Notre Dame Avenue, from Sherbrooke Street to Main Street. The neutral point between Mill Street station and St. James substation was also near Sherbrooke Street. It was thus logical not only to transplant No. 10 substation to the west but also to select a new site for it in the vicinity of Portage and Sherbrooke Streets.

As the whole situation thus pointed to the importance of reducing the track potential between Sherbrooke Street and Main Street to the lowest possible amount, it was decided to transplant the Assiniboine Avenue 1,400-kw. machine to a new substation to be built in the above named locality and add an 800-kw. machine from Mill Street to it, in order to get three-wire operation in the new Sherbrooke district, replacing the latter machine at Mill Street by creating another reconstructed motor-generator out of two old engine-type generators, an 800-kw. alternator and an 850-kw. direct-current generator, still standing in the old Assiniboine steam plant. Three 833-kw. lowering transformers and a 22,000-volt cable from Mill Street supply the power.

This plan has been carried out accordingly, the substation building on Sherbrooke Street is now completed and the equipment is being installed in it. Two-wire operation, with the 800-kw. machine, has already been tried out from this station and has shown that the track potential along Portage Avenue from Sherbrooke Street to Portage and Main Streets, about 1 mile, can be reduced from about 12 volts to 2 volts, and that with three-wire operation the potential difference on this heavy line will be practically negligible.

The Logan Avenue substation has but one machine in it, and as there is no other motor-generator available to pair with it for enabling three-wire operation it was decided to extend the negative insulated return feeder system that had several years previously been installed there with a negative booster.

This station is to be fitted with a new arrangement of resistances in such a manner that the track in front of the station will be the point of lowest potential of the track system, which has not always been the case hitherto, due to faults in the original installation.

The three-wire system causes frequent reversals of stray current in underground cable sheaths in districts where the traffic is light. The scheme of cable drainage contemplates maintaining all present drainage connections into the substations. When circumstances require, it is proposed to use small negative boosters, or "suckers," of about 1-kw. capacity each with resistances in series, if needed, to assist in determining the inward direction of cable drainage current, subject to the approval of the Public Utilities Commission, which under the law has jurisdiction over the amount of drainage to be applied to all underground cables.

SPECIAL CONSIDERATIONS IN THREE-WIRE DISTRIBUTION

With the three-zone system of three-wire sectioning and only two machines in a substation, the positive machine is apt to be overloaded and the negative machine underloaded, when both are the same size or nearly so. It has been found necessary in several cases to vary the zoning arrangement to favor the substation machinery by dividing the load more evenly between the two machines. Several outlying suburban lines reaching into distant districts have their polarity reversed, on account of the sparseness of parallel underground structures, but it is likely that positive and negative zones will have to be alternated frequently on light lines just within the outskirts of the city.

In the case of the North End substation, the two machines are of the same size, 800-kw. each, and the load in the district is already about as much as the two machines can carry. Consequently it has been necessary to cut the district up into more than three zones of opposite polarity in each direction, so as to have the aggregate negative load more nearly equal to the aggregate positive load. This has worked very successfully, and the cable drainage current predominates inward.

DETAILS OF THE SECTION INSULATORS

The method of sectioning the trolley wire consists simply of placing two standard section insulators in series, with the adjacent tips only a few inches apart. There have been no accidents whatever to the overhead construction from accidental short circuit, either between trolley wires or feeders of opposite polarity. The only accidental occurrences chargeable to the three-wire system have been an occasional short circuit caused by careless platform men placing both trolley poles of double-ended cars against the trolley wire on opposite sides of a 1,200-volt breaker when turning cars, which happened in a very few instances when the central district of the city was changed to three-wire operation during the past summer. As the two breakers in series make a rigid spot in the trolley wire that causes the trolleys to wear out the breaker by pounding, it is probable that a single breaker with 16 in. of insulation will be gradually substituted for each pair.

Permanent potential wires are installed from all outlying extremities to the substation in each district, connecting to a permanent recording track potential voltmeter in the substation, from which charts can be taken at any time, thus enabling a constant check on the resulting distribution of track potentials to be made.

About 38 miles of No. 10 insulated weatherproof wire are required.

The regulation regarding track potentials is as follows:

> . . . the maximum potential difference between any two points one thousand (1,000) feet or less apart on said rails or other metallic conductors will not exceed one (1) volt, and further, so that the potential difference between any two points more than one thousand (1,000) feet apart on said rails or other metallic conductors will not exceed seven (7) volts, such maximum voltage drop *to be the mean value between the highest momentary peak and the average for the thirty minutes of maximum load,* but such track voltage requirements shall apply only on a business day and not to abnormal operating conditions brought about by fires, storms or the movement of crowds on holidays.

The above method of computing the average track voltage result is not Professor Ganz's, but was borrowed from the unofficial standard method of interpreting the British Board of Trade regulations used in England. A little study will show that the *legal* average of a fluctuating voltage curve will be higher than the real average, in the proportion that the momentary peak exceeds the real average. Therefore, the actual average must be brought below 7 volts, if the legal average is not to exceed 7 volts. This very rigid restriction is being met in Winnipeg by the three-wire system in a very remarkable degree, even before the system is completed.

Completion of the system, hitherto delayed by the inability of manufacturers promptly to deliver even the simplest details of electrical equipment, is looked for within a few months, and after the final adjustments have been made a more comprehensive record of results which have actually been accomplished will be available.

SUBSTATION CHANGES

The changes in substation connections were very simple. Fortunately, many of the machine panels were already provided with double-throw main switches, on account of the earliest installation of motor-generators having been designed to operate interchangeably with the railway circuits and with a commercial 500-volt power circuit, which is still maintained by the company. This fact was particularly helpful in working out the changes in the Mill Street substation, which is the largest and most centrally located.

The principal task in arranging this switchboard consisted in the addition of a new negative busbar and the installation of a heavy single-pole circuit breaker, which can connect the positive and negative buses by being closed when two-wire operation is desired.

The breaker is maintained open for three-wire operation. This general principle of bus connection is followed in all stations to connect and disconnect the positive and negative buses for changing from two-wire to three-wire operation.

The original internal connections of the machines themselves are not altered and the relation between the field and armature connections of the generators is not changed when the polarity of the machine is reversed. Usually the same machine is always run on the same side of the system. The same feeders are also maintained permanently at the same polarity in order to establish fixed conditions of automatic cable drainage.

Interlocks are being devised which will automatically prevent mistakes by substation operators in throwing machine and busbar switches when changing polarity.

The schedule of substation equipment under the new arrangement will be shown in table below:

Mill street	1—1,500-kw.	1—1,200-kw.	1—850-kw.	1—800-kw.,	4,350 kw.
Fort Rouge	1—1,000-kw.	1— 800-kw.			1,800 kw.
St. James	1—1,200-kw.	1—1,000-kw.			2,200 kw.
North End	2— 800-kw.				1,600 kw.
Logan	1—1,200-kw.				1,200 kw.
St. Boniface	2— 400-kw.				800 kw.
Sherbrooke	1—1,400-kw.	1— 800-kw.			2,200 kw.
				Total	14,150 kw.

Another feature of this installation, which will be added to it during the next few months, is a system of feeder-tie switches to be mounted on poles at the boundaries of adjoining feeding districts and worked by control wires from the nearest substation, so that some of the positive feeders and some of the negative ones may be used to interconnect the substations and operate the whole system in parallel on either the three-wire or two-wire system. This is intended to safeguard continuity of service on the three-wire system as much as possible in case of failures of machines in the substations; to permit three-wire operation of the whole system throughout the entire twenty-four hours (it being customary to shut down all but the Mill Street substation from midnight till morning), and to permit change-over to two-wire operation quickly if required in extreme emergencies.

The foregoing feeder rearrangement has so far been carried out without the purchase of any quantity of new feeder cable. Enough cable will be salvaged to provide whatever may be deemed advisable to supplement the trolley wires on several of the heaviest routes, to prevent overloading of the trolley wires, especially should one of the trolley wires happen to pull apart, which sometimes happens during the extreme cold winter weather. The total amount of feeder cable in use in the trolley distribution system in the city of Winnipeg is about 75 miles, of which about 20 miles is being taken down and re-erected to feed the new arrangement of positive and negative sections and to provide the above-mentioned system of tie feeders.

INVESTIGATION OF SELF-CORROSION

In all previous investigations and attempts at electrolysis mitigation in Winnipeg the peculiar chemical composition of the soil in and about the city had been ignored.

The deterioration and occasional complete destruction of underground structures, built of cement concrete, by the alkaline salts dissolved in the ground water has been so widespread in western Canada that the engineering profession has been compelled to recognize the risk run by all such structures and take steps to minimize it where possible. The general public is now aware of the continual jeopardy in which all buried concrete structures are placed, by virtue of being in soil containing a high content of soluble alkaline salts, which are mostly carbonates, sulphates and chlorides of magnesium, calcium and sodium, in combination.

The destruction of even the best concrete by these alkaline solutions in the soil led the writer to institute an investigation, with the aid of a professional chemist of high standing, to determine the effects of the contact of such solutions upon cast iron and lead, both with and without access of stray electric current.

The investigation is not yet complete, but enough work has been done in the laboratory and corroborated by examinations of buried pipes in areas where stray current does not exist to demonstrate that the customary attitude of blaming stray current from the railway for the widespread pipe corrosion in Winnipeg, under the existing soil conditions, is subject to considerable modification. The programme of the construction work necessary to achieve the reduced track potentials and gradients will not, however, be altered in any way by reason of this recently acquired knowledge of self-corrosion possibilities.

ORGANIZATION

The field work in the foregoing programme has been done by the construction force of the electrical department of the Winnipeg Electric Railway. The earlier part of the work of execution, comprising the design and construction of electrical details in Fort Rouge and the design of the electrical connections in St. Boniface substation, was begun by G. A. Mills, then electrical engineer, and brought to completion by Arthur Trott, electrical superintendent, who also had executive charge of designing and carrying out the details of all electrical switchboard changes at Mill Street, North End, St. Boniface and St. James stations and of all details of the new electrical equipment at the Sherbrooke substation.

The difficult task of changing over the railway switchboard at Mill Street substation from two-wire to three-wire was also laid out and executed by Mr. Trott, with the assistance of K. C. Ferguson. Their work also included the mechanical and electrical assembly of the reconstructed motor-generators. The trolley and feeder rearrangement was executed by O. W. Boyle, superintendent of electrical distribution. The mapping of the circuits and working up the details for their rearrangement, together with the large amount of field testing required to prove out results, were done by H. G. Stewart. To the interest, foresight and loyal co-operation shown by the entire organization is due the smoothness and the freedom from interruption of electrical operation during the transition period. The execution of field work not yet completed will be carried out by D. K. Lewis, recently appointed electrical engineer of the company.

The responsibility for the general conception, design and supervision of the entire scheme and for the engineering procedure throughout has been carried by the writer.

Illinois Utilities Hold Successful Joint Convention in Chicago

Papers and Discussion on Shop Personnel and Maintenance, Track Labor-Saving Devices and Automatic Substation Operation—Joint and Sectional Sessions Were Held Each Day, the Former Devoted to General and the Latter to Specialized Topics

FROM a railway standpoint, a very valuable and practical paper on automatic substation operation and the discussion that followed were outstanding features of a joint convention of the Illinois Electric Railways, Illinois Gas and Illinois State Electric Associations in Chicago on March 15 and 16. The joint meetings of the three associations were held during the forenoons, while separate simultaneous sessions were held each afternoon. At the opening session, on March 15, the joint meeting was addressed by W. M. Willett, president of the Gas Association, who referred to the significance of the joint convention. He said it demonstrated that the utility companies have recognized that the fundamental interests of these three utilities are one and the same. He considered this recognition in itself to be a great stride forward as it is only a short time since at least two of the organizations represented considered themselves competitors, and that the recognition of any virtue in one by the other would have been considered a sign of weakness. One of the happy results of the struggle for existence during the past few years has been the cementing together of these great lines of industry until today they are seeking co-operation. They are drawn together by a natural, logical and fundamental bond. The great work for the immediate future is to extend this period of co-operation and confidence to include the 7,000,000 customers served in the State.

In addition to the transaction of the business of the convention, the meeting was occupied for the remainder of the first morning by an address by John F. Gilchrist, vice-president Commonwealth Edison Company, Chicago, on the financing of public utility extensions through the sale of securities to the customers.

At the joint session on the second forenoon Charles H. Munroe and Martin J. Insull, presidents of the American Gas Association and National Electric Light Association respectively, addressed the meeting. Philip H. Gadsden, president of the American Electric Railway Association, was to have addressed the meeting, but was unable to be present.

Mr. Munroe spoke briefly on the work of the American Gas Association, with particular reference to the effort which had been made to bring about a basis of taxation that would remove the unfair advantage now obtaining for municipal bonds sold to cover the cost of public utility plants. He pointed out that because of the exemption of municipal bonds from the income tax, a big differential in favor of the municipal bond over private corporation bonds, though issued for the same identical property, is set up. He said that people who are in the upper register of the income tax and are required to pay back to the Government 73 per cent of their income are forced to buy tax-exempt bonds. Because of this situation, the bonds of the privately owned utility company would have to yield 22 per cent in order to be equivalent to a 6 per cent municipal bond. The Gas Association endeavored to secure the co-operation of the two other major utility associations in obtaining exemption of privately owned utility bonds from the income tax until such time as a constitutional amendment could be passed which would place a tax on municipal bonds representing utility plants. However, there was some feeling on the part of the other associations that this was not just the right way to go about it and the matter was dropped, to the regret of Mr. Munroe. He said, however, that Carter Glass had devised a scheme which would accomplish indirectly what his association had been unable to do directly. It is impossible to tax municipal property except by a constitutional amendment, but it is possible to tax the income from the operation of such municipal utilities. This, if carried out, would probably serve to remove the advantage municipal bonds now have over the privately owned utility bonds.

Mr. Insull spoke at some length of the work of the N. E. L. A., its service, engineering and publicity departments, and also of the success which has followed the geographical section reorganization of the association. He emphasized the point that excellence of service on the part of the utilities is the best means of creating and preserving good public relations.

A paper was also presented by W. L. Abbott, chief operating engineer Commonwealth Edison Company, on the broad subject of "The Consumers' Stewardship of the Coal Deposits."

PROCEEDINGS OF ELECTRIC RAILWAY SECTION

At the electric railway section meeting on the afternoon of March 15 M. J. Feron, general superintendent of transportation Chicago Elevated Railroads, read a paper which described the method of keeping a continuous traffic check on the elevated roads and North Shore Line. This paper appears in abstract elsewhere in this issue. In discussing Mr. Feron's paper, D. E. Parsons, general manager East St. Louis & Suburban Railway, East St. Louis, Mo., said that to an operating man in Illinois outside of Chicago Mr. Feron's paper was somewhat like a fairy story. He did not believe there is any property outside of Chicago requiring an organization for traffic survey alone. Most of the analyses are accomplished by observation of the number of passengers carried on the different divisions, either weekly or monthly, and in cases of unusual conditions, daily. He spoke of the difficult rush-hour problems in East St. Louis and said that while the regular and non-rush-hour schedules in East St. Louis are seldom changed, it is necessary to subject the rush-hour schedule to frequent and radical changes. Control of the service during the rush hour is nearly all done by observation through the supervisors in charge of the different divisions. The rush-hour service is augmented by trippers, which are regularly scheduled for a certain period of time each morning and afternoon, and extras, which do not run on any schedule but are under the supervision of the assistant superintendent of transportation. These extras are handled to the best advantage through agreement between the supervisor and the assistant superintendent as to how they will be operated on any particular day. Conferences are held about twice a week to determine the use of the extras.

In East St. Louis, where the different industries close at different hours, it is possible to use one car on as many as four routes during the evening rush hour, thereby getting the full benefit of each car and not allowing any layover of consequence at any particular point. The lines are generally of short haul and it is easy to handle the extra cars in this way.

About double the number of cars are required for rush-hour operation as are necessary for the non-rush-hour service. One route requires nine cars for the non-rush-hour schedule and twenty-two cars in the evening rush hour. On the stockyards division four cars are run during the non-rush-hour, while in 1920 it required twenty-six cars to give the rush-hour service.

Mr. Parsons also described the operation of the company in a community of about 25,000 people, in which the city cars serve as feeders to the interurban line which runs to St. Louis. Some years ago these cars were operated like taxicabs for the benefit of the residential patrons. For example, the motorman would ring his bell on the outbound trip to notify the patrons that he would be back in a little while, so they could hurry with their breakfasts, and the motorman would then stop in front of each patron's residence on the way back. This personal service had to be stopped, as there were cases where the motorman and a patron had some little difference and the former would refuse to stop in front of the patron's residence. This gave rise to some difficulty and it was necessary to change the regulations for stops at street intersections only.

J. M. Bosenbury read a paper on some aspects of shop personnel which appeared in the issue of the ELECTRIC RAILWAY JOURNAL for March 19, 1921. John Sutherland, master mechanic Tri-City Railway, Davenport, Iowa, discussed this paper at some length, telling of some of the shop practices followed by his company. He said that all rolling-stock is inspected and oiled on a fifteen-day basis. During the war, when the company had 312 cars on the system and needed every one of them in service every night and morning, the shop department was given only seven hours each day in which to take care of the inspection and maintenance work. For fourteen months all of the cars, almost without exception, were in service every day.

Several questions were raised in regard to the fifteen-day inspection period. Mr. Sutherland explained that the use of slack adjusters, which had eliminated four men from the inspection force, and the oil wells in the modern motors made this fifteen-day inspection period possible. In addition to the fifteen-day inspection, every car is given a thorough overhaul once a year, whether there is apparent need of it or not. This inspection plan applies only to the cars used in city service. These average from 150 to 178 miles per day, and of the total number eighty-four are equipped with modern motors which Mr. Sutherland believed could run thirty days without oiling if necessary. Questioned as to the kind of oil used, he explained that at the present time both Standard and Texaco were being used and that this is the first year in ten that the company has not had an oil contract.

One of the factors in the excellent results obtained with this infrequent inspection is that all bearings are renewed once a year whether or not this is needed. All armature shafts have been made a standard size so that all bearings are interchangeable and are clamped in place instead of being held with a dowel pin. A good grade of wool waste is used and "teased up" every fifteen days when the new oil is put in. Mr. Sutherland explained that he employed but one armature winder and a helper, and had 1,013 armatures on the property, and that much outside repair work was done also.

Asked why he preferred the time basis to a mileage basis for inspection, Mr. Sutherland replied that the fifteen-day inspection period had been started eight years ago and had been so successful that no change had been made, but he had no preference other than this. In reply to further questioning, he said that the total cost for the maintenance of equipment amounted to about 8 per cent of the gross, or from 2.9 to 3.2 cents per car-mile.

There was also some discussion about the efficiency of labor, and Mr. Sutherland explained that some time ago 40 per cent of the shop force was discharged and that today the production is equal to what it was before.

STARTING THE NEW EMPLOYEE RIGHT

Following a paper on the consideration to be given the new employee, by W. R. Helton, Chicago Elevated Railroads, which appears elsewhere, there was a general discussion of the difficulties and advantages of union labor in electric railway shops, particularly as to the wisdom of promoting union men to supervisory positions. The views taken were quite divergent, the officials of the Chicago Elevated Railroads being quite enthusiastic about the measure of co-operation which they had been able to obtain from union employees, although operating on the open-shop principle.

F. E. Fisher, general superintendent Chicago, Ottawa & Peoria Railway, Joliet, Ill., said that the method of following up the employees recommended by Mr. Helton was especially applicable where the size of the property was large enough to justify the employment of a personnel specialist and the necessary clerical force to keep the records. On the small properties, however, the follow-up work of the new employees falls to a large extent upon the foreman of each department through his daily association and contact. This makes it necessary to select the foremen with great care in order that the best results will be secured. In connection with this follow-up work, Mr. Fisher said that the holding of a school of instruction at frequent intervals for the different departments had been of great value. At these meetings matters of interest to the company and the employees of the department in session at the time are discussed by the heads of the departments, their foremen and the men, resulting in an efficiency through understanding and knowledge which far offsets the cost.

Mr. Fisher said that in his judgment the most important feature of starting off a new employee was, as Mr. Helton had stated, to instill in his mind a favorable impression of the company, his working conditions, the possible opportunity for advancement in his new field of labor, etc. If this is accomplished, the man becomes a satisfied and ambitious employee to start with, and if his efforts are given proper recognition the chances are that he will make a permanent and efficient employee. As evidence of the success attained along this line, he pointed out that the head of every department of his company was a man who had been connected with the company for a long term of years and had worked his way up through the ranks.

Mr. Fisher also commented that the follow-up on employees means more than just watching to see that the proper amount of work is performed in an efficient manner. It means that if an employee is apparently neglecting his work, or if his name is appearing too often on accident reports, something is wrong, that his mind is not on his work. Possibly some financial or family trouble is worrying him, and his foreman or immediate superior should be the first to notice this condition and at an opportune time approach him on the subject in such a manner as to secure his confidence and thus be in a position to help him out, thereby removing the possibility of an accident, or something worse. Co-operation between officials and employees is more than ordinarily necessary at this time in order to insure efficiency in operation.

APPLYING QUICK-TRAINING METHODS TO LINEMEN

At the second session of the electric railway association three papers which aroused a great deal of interest were presented. The first of these was by Theodore Blech, on the subject of "Graduating 'Mike' as a Lineman in Three Months"; the second by Charles H. Clark, on "Labor-Saving Devices of the Maintenance of Way Department and What They Save," followed by a three-reel motion picture showing the construction methods followed by the track department of the Cleveland Railway, and the third by Charles H. Jones, on the results of automatic substation operation. The first and third of these papers appear in abstract elsewhere in this issue. Mr. Clark's paper was abstracted in the March 19 issue.

In reply to questions on the special method of training linemen, Mr. Blech explained that after completing the course the new linemen are divided into classes A and B, while the old, experienced linemen are considered in class C, the three classes having different rates of pay. The class A and B linemen are considered qualified to work on "cold" lines, but they do not attempt to handle any live lines until after they have acquired actual experience in the work. The average age of the men secured to take the special training work has been twenty-one and one-half years. A good many of them are high school graduates who, it is expected, will make good additions to the engineering department later on. Mr. Blech explained that it was at first hard to interest the men in the work until it was pictured to them in the light of adventure, which has apparently been a successful appeal. The men were paid 55 cents an hour while going through the school at first, but this has now been reduced to 50 cents.

CLEVELAND CONSTRUCTION METHODS PICTURED

Considerable interest was manifest in the construction methods of the Cleveland Railway, and Mr. Clark was asked numerous detail questions, most of which have been covered in various articles in the ELECTRIC RAILWAY JOURNAL describing several phases of the track construction work in Cleveland. Summing up the total saving which has been accomplished through the extensive use of machines in this work, Mr. Clark said that since 1910 wages have increased 163 per cent, while the cost of the track construction work has increased but 40 per cent.

Speaking of the advantages of tilting the rail ¼-in. inward, Mr. Clark explained that this overcomes the need for tie rods, causes the wheel to fit the rail so that the wear takes place on the back instead of on the flange side, practically does away with corrugation and saves about 25 cents a foot. The rails are tilted by a special preparation of the steel ties used, which costs about 10 cents extra per tie. The concrete type of track construction is used practically everywhere in Cleveland, except on some short pieces of unimportant track, or where it is impossible to keep traffic off the track until the concrete can set. In these cases the track is tamped up on crushed stone, which is grouted in thoroughly, making practically a concrete construction.

In reply to a question Mr. Clark said that it is necessary to tamp the concrete under the steel ties in order to get a good bearing. Not only is the concrete tamped under the ties as poured, but it is tamped again about 50 ft. back from the pouring point, where it has begun to set. Asked about the standard use of high T-rail instead of girder rail in Cleveland, he called attention to the fact that this type of rail is now $5 less a ton than the girder rail. He closed his remarks by commenting that the Cleveland Railway was the first to reduce wages in the track department, a reduction from 50 cents to 40 cents an hour having been made.

S. J. Steiner, assistant engineer maintenance of way Aurora, Elgin & Chicago Railway, in discussing Mr. Clark's paper, commented that in interurban work the ditcher is an excellent labor-saving device, since it may be used for loading and unloading various materials as well as for doing its normal work of ditching and shoveling. He spoke also of the saving to be realized from treating ties and said that the number of renewals per year was only about 50 per cent as great with treated ties as with untreated.

C. B. Coates, Chicago Pneumatic Tool Company, spoke of the substantial saving which may be realized from the use of machines for track drilling and driving screw spikes. He described briefly improvements which have been made in the design of the motors used in this work by his company, whereby the free-running or no-load speed of the motors has been greatly reduced. This avoids the burning of drill points at the start and finish of a hole. He also mentioned the improvement brought about through the use of automatic resetting circuit breakers which avoids any possibility of burning out the motor, without involving delay and annoyance in resetting the circuit breaker. This feature is particularly advantageous when drilling high carbon steel rail. He also spoke of the readiness of the company to develop a dry-drilling tool if a sufficient demand develops.

DISCUSSION ON MR. JONES' SUBSTATION PAPER

A. P. Jenks, General Electric Company, Chicago, commented that the information brought out by Mr. Jones should carry considerable weight with the operating men as to the reliability and ruggedness of the automatic equipment. When the automatic control equipment for railway substations was first put on the market, most every one thought of it only in connection with interurban railroads, but its field of application is now considered practically unlimited. He said that in the future the large urban system will be the largest user of this type of equipment, replacing present hand-operated stations, since economies resulting will in most cases show a very handsome return on the investment, justifying the installation on a money-saving basis if for no other reason. It will also be used undoubtedly in an extensive way in connection with the electrification of steam railroads.

Mr. Jenks spoke of the extent to which automatic equipment has been employed and said that the General Electric Company has sold more than 100 equipments ranging in size from 300 to 2,600 kw. A very important installation is being made this year in Australia, consisting of eight 1,000-kw. substations for use in connection with the electrification of one of the steam railroad systems. An extensive installation of automatic equipment is also being installed by the Kansas City Power & Light Company on its Edison three-wire system. This will comprise five substations, four of which will contain two 1,500-kw. converters and the fifth a 2,600 and a 2,300-kw. machine and involve an investment of approximately $500,000. The automatic control equipment may now be considered as absolutely standard and the manufacturer is prepared to furnish it in capacities up to 5,000 kw.

E. J. Blair, assistant to the president Chicago Elevated Railways, emphasized the point that very good results may be obtained from putting automatic control equipment on old rotary converters, even though they may be of comparatively small capacity, locating them at points intermediate to the present substations. Because of the load-limiting resistances it is possible to keep the converter on the line during what would ordinarily be heavy overload conditions, and this makes it possible for the machine to be operated at a much better continuous load factor and thus enables one to "get away with" a 500-kw. machine where perhaps a 1,000-kw. unit would normally be specified on a new purchase.

S. A. Ralston, Rockford, Ill., and Edward Taylor, E. W. Allen and Hall Roosevelt of the General Electric Company, and Victor Thelin, Chicago Surface Lines, discussed Mr. Jones' paper. A prepared discussion by S. E. Johnson appears elsewhere in this issue. Mr. Roosevelt endeavored to show the members how to go about the rather involved economics of automatic substation installation on large city properties in determining the most economical layout of manual and automatic stations. Mr. Thelin told of the success which had been had on the Hammond, Whiting & East Chicago Railway with the installation of automatic reclosing circuit breakers at the end of a 30-mile section. The practice here is to depend upon a large substation for the main power supply, while a subsidiary station, in which the reclosing circuit breakers are installed, is started up in the morning, the breakers set, and then left all day without an attendant. This has produced a very substantial saving and involved no trouble thus far. Mr. Thelin expressed the view that it is highly desirable to have resistance in the main rotary converter circuit so that the machine will remain on the line under overload conditions for a reasonable time, but he considered it inadvisable to place resistance in the feeder circuits. His reasoning for this was that it is desirable that the feeder circuit breaker should be thrown out in case the line gets down on the rail, and remain out until the line gang can remove the trouble.

Ralph H. Rice, Board of Supervising Engineers, Chicago, commented briefly on how far the application of automatic equipment should be extended on large city systems and the economics of the number of substations. He said that in Chicago, with thirty-five substations, he thought that this was not a sufficiently large number to represent the most economical scheme. He raised the question of whether in such systems the full automatic equipment should be applied to substations or only certain of the automatic features, contending that where the power is practically never off, some of the automatic features may not be economically justifiable.

CONVENTION CLOSES WITH JOINT BANQUET

The joint banquet of the three associations, held on the evening of March 16, was very largely attended. Rufus C. Dawes, Chicago, acted as toastmaster. In his opening comments he made the point that the investment in the several public utilities is so very enormous that it would be impossible for the public to take on so huge a public debt. He considered it to be to the interest of the public and the investors that the utilities be kept in private ownership and operation, with a complete understanding between public and companies. The speakers at the banquet were the Hon. Ira P. Copley, United States Congressman from Aurora, Ill.; Charles A. Munroe, president American Gas Association; David Kinley, president University of Illinois, and David Gschwindt, president Illinois State Electric Association.

Making Continual Traffic Checks*

By M. J. Feron

General Superintendent of Transportation Chicago Elevated Railroads and C., N. S. & M. R.R.

During each twenty-four hours the Chicago Elevated Railroads operate a total of 2,584 trains and 8,661 cars, or an average of three and one-third cars per train, with a total of 191,000 car-miles per day. During the maximum evening rush hour, which is from 5 to 6 p.m., we carry 61,000 passengers out of the Loop District alone. To take care of the enormous peaks efficiently, we found it absolutely necessary to create a traffic survey organization, consisting of a superintendent of car service with the necessary assistants. The function of the traffic survey organization is the collection and compilation of information concerning traffic characteristics so that the officer in charge of operation will have such information as will lead to maximum operating efficiency.

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*Abstract of paper presented before Illinois Electric Railways Association in Chicago, March 15, 1921.

All our traffic data are collected in the field by men who have no other duties to perform. They are located on the different roads at points where passing trains have their maximum load, and they become very expert at collecting these data. The figures thus obtained are entered on forms and include the number of the first car on each train, the number of passengers in each car of the train and the branch of the road from which the train came or is going to, as the case may be. These data are collected continuously every day in the week, including Sundays, from 6 a.m. until midnight. A survey is taken of the traffic between midnight and 5 a.m., twice each month. After collection, these data are sent each day to the office of the superintendent of car service, where they are compiled and tabulated. The information is there transferred from the daily forms to a monthly form.

The purpose of this monthly form is to show the loading conditions of each train on the road at any time of the day or any day in the month, except for Saturday and Sunday. On these days an entirely different schedule is operated than on the other five days of the week, so that the records for Saturdays and Sundays are kept on separate forms.

These data furnish a picture of just what each train is doing day by day for the month. They also help in the preparation of new schedules. Memoranda are kept also of the weather conditions on each day.

In addition, the number of passengers passing through each station is registered. At heavy stations, readings of the register are taken every five minutes. A count is also taken at heavy transfer bridges.

PRACTICE ON NORTH SHORE LINE

The Chicago, North Shore & Milwaukee Railroad operates a total of 247 trains on week days and 266 trains on Sundays. On week days forty-four of these are limited trains, operating between Chicago and Milwaukee, thirty-two are express trains, operating between Waukegan, Ill., and Chicago, the remainder being local trains running between Evanston, Waukegan and Milwaukee, and between Lake Bluff and Area. On Sundays there are seventy-two trains between Chicago and Milwaukee, thirty-six each way. Of this number thirty-five are express trains between Chicago and Waukegan, and the others are local trains.

The car-miles run on this line are from 17,000 to 23,000 per day. The number of passengers varies from 30,000 to 38,000 on week days and from 38,000 to 45,000 on Saturdays and Sundays. On account of this variation it was found necessary to take a daily traffic survey of this business, but due to the length of the road, it was not practical to collect the data in the same manner as on the Elevated Lines. We therefore supply each conductor with a traffic report form, showing the names of thirteen important stations along the line. The conductor enters up the number of passengers on his train when leaving each station. He turns this card in at the office at the end of his trip with his cash report. These traffic cards are then checked to the number of passengers on the train at any point. The data are then transferred to a monthly sheet. The collection and tabulation of these data is considered one of the most important duties we have to perform.

Graduating "Mike" as a Lineman in Three Months*

By THEODORE BLECH
District Superintendent Public Service Company of Northern Illinois, Waukegan, Ill.

THE demand for man power which has affected all industry since 1917 had a disastrous effect on the power stations. This was largely due to fixed rates and rising costs, and utilities could not keep step with wages offered by manufacturers. With the ranks of the utility companies becoming depleted, the writer advocated a radical departure from the traditional method of "making" linemen. The transition from a groundman to a lineman usually required from two to four years, as the position of a "hot" lineman was rightly considered a sacred one due to its impending risk and responsibility. It was this need for trained linemen which prompted the Public Service Company of Northern Illinois to put into action a plan of making a lineman out of "Mike" in three months. We were successful in Waukegan with this plan and now are well ahead with the third successive class of initiates.

Waukegan, located on Lake Michigan, is some forty miles north of Chicago and surrounded by a number of large industries. This district, of which the city is a part, known as District A, takes in about 400 square miles of Lake County, comprising about a dozen municipalities. There were four engineers in this district, who, together with the meter foreman and the line construction foreman, constitute the school "faculty."

When the linemen's school was first advertised common labor was paid $1 per hour. The young man of adventurous vein who wished to acquire good knowledge and a trade that insured him a permanent living was appealed to by two quarter-page advertisements. The newspaper editors gave us an interesting write-up. The response was surprising.

The applicants were addressed as a university would address prospective students. They were promised a three-month college course with the exception that they would be allowed a nominal wage to defray their expenses, with the understanding that upon graduation their rate would be adjusted to conform to the company's standard rate.

Generally speaking, the course comprised a daily lecture and quiz from 8 to 9:30 a.m. and thereafter practical training in the field. Lately there has been added a weekly evening course in which the elements of electricity are explained. This is open to all employees and particularly to the student lineman. The school is in charge of a line foreman who has had seventeen years of experience.

THE LECTURE CURRICULUM

In brief, the following is an outline of the lectures:

Mondays—A meter foreman elaborates the principle of the electric meter, not only from a theoretical but also from a practical standpoint. The meter foreman also teaches resuscitation by the "prone method."

Tuesdays—An engineer handles such subjects as the development of modern alternating current system; changes required by local conditions, such as changing to three-wire system, increasing size of conductors; use of step-down transformers; remodeling existing lines; work order and agreement sketches; Underwriters' Code; utilities rulings; transformer connections, external and internal, and discussion of problems submitted by students.

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*Abstract of paper presented before the Illinois Electric Railways Association, March 15, 1921.

Wednesdays—The district superintendent familiarizes the students with the complete network of transmission lines, explaining the difference in construction. Later he takes up the organization, and other various welfare functions, such as savings fund, pension system, safety organization, N. E. L. A. work and the Co-operative Council (organization of employees and management representatives) and, toward the end of the course, a complete review of the work done by all other teachers is made.

Thursdays—The assistant inspector teaches the principles of electricity, beginning with Ohm's law. He mostly confines himself to theory and carries on a quiz course which leaves every student carefully posted.

Fridays—The chief clerk dwells on the work done by other departments.

Saturdays—The line construction foreman takes up construction work following along the school's previous week's practical work, gives his viewpoints on good work and points to be avoided.

THE PRACTICAL WORK OF THE COURSE

The first day the students are taught the use of pliers and connectors. They are then taken out to the pole yards for the next two weeks. They set first a 20-ft. pole, which they are taught to climb, and then proceed to set six to eight 30-ft. poles which are crossarmed, anchored and wired, both for primary and secondary service. Then the whole line is dismantled and rebuilt.

The third week the class is taught how to hang, connect and remove a 1-kw. single-phase transformer. Later on a regular three-phase bank is installed. All of the above work is on "dead" lines and takes up about one month.

During this period every operation, whether it be climbing, handling of tools, making splices or repairing of cut lines, is drilled over and over again until every man does the work to the entire satisfaction of the foreman. The simple trick of throwing a handline between two wires is practiced until the students hardly ever throw wild.

Beginning with the second month the students start to work on the 220-volt secondary distribution lines. This gives them the first contact with live circuits. They run and repair services, repair secondary lines, straighten poles and pull up slack wires. Stress is put on thoroughness and not on speed, as the object is still training.

Upon completion of the course the men are transferred to the regular line gangs of other districts.

THE COST OF THIS TRAINING WORK

It is difficult to state definitely what the cost of a course has been. The only expense to consider is one month's wages, salary of the foreman and use of truck and driver. After the first month the crew is doing some maintenance work, and so becomes an asset instead of a liability. The truck is utilized mornings to haul freight to the storeroom while the class is attending lecture, thereby reducing the expense materially. The tools are furnished the men with the understanding that they become their property provided they remain in the company's employ six months after graduation.

During the six months ended Feb. 16, 1921, we graduated nine men who are now employed in other districts and the present class is composed of seven men, six of whom will probably graduate.

This experiment is commended to the larger electric companies, where, it is believed, the results obtained will be more far reaching and beneficial.

Introducing the Employee to the Job and Following Him Up*

BY WALTER R. HELTON
Manager Real Estate Department (formerly Employment Manager) Chicago Elevated Railroads.

THE law of first impressions applies forcibly to the man entering upon a new job. Care in directing the formation of these first impressions is rewarded by a state of mind of the man that makes for better results.

This was illustrated in my own case, when a number of years ago, in following my trade in car building, I secured a job at a car-building plant in Chicago. Here so little attention was paid to my partner and myself in getting us started, and we had so much trouble in finding the needed supplies, that we did not stay long. On the day we left nine other experienced men did the same thing. This shop was advertising for men every day.

Our next job was in the repair shop of one of the largest Eastern railroads, where, regardless of the fact that the work was all done out in the yard, we were satisfied with the work mainly because the foreman and the master mechanic seemed to consider it a part of their job to get us nicely started. To this day the period of employment in that company's service is remembered as pleasant, and a feeling of friendliness exists toward that great railroad corporation.

Every man who enters upon a new job is to some extent handicapped more or less by what might be termed "stage fright," and anything said or done to remove that feeling will react in the man's more rapid attainment of efficiency. His first impression should be that he is more than a mere cog in a wheel. In addition to explanation of the detail of job a brief outline of the social activities of the employees, their interest in the dances, club features, other entertainments, etc., will aid in arousing the interest of the new man and help him to feel that he is one of the family.

When the new man has his "feet on the ground" it is well to go after the production end, at which time the allowances in bonus or other rewards should be carefully explained and demonstrated.

Often a man is left to his own resources after he has started work and is allowed to develop his own line of training incidental to the particular job, shop or organization in which he is engaged. The result of this is lower production, both in quantity and quality. A carefully planned, rigidly executed system of follow-up will invariably pay handsome returns for the time and expense incurred by having some one who is possessed of considerable tact.

The methods of initiation and follow-up as outlined herein are not practiced in detail by the Chicago Elevated Railroads, although a great deal of progressive work has been carried on in this direction by them.

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*Abstract of paper presented before the Illinois Electric Railways Association in Chicago, March 15, 1921.

Checking Up On Automatic Substation[*]

A Complete and Detailed Study of the Functioning of the Equipment in the Substations on the North Shore Line—Counters and Recording Instruments Were Used to Produce a Very Enlightening Record of Operations—Test Runs on Three Stations Show Their Efficiency and the Distribution of Losses

By CHARLES H. JONES
Chicago, North Shore & Milwaukee Railroad, Chicago, Ill.

IN ORDER to handle a very large increase in the business of the Chicago, North Shore & Milwaukee Railroad it became necessary in 1916 to make extensive additions to the power system as it then existed. It was adequate to handle the load of single-car operation, but with the advent of heavy train operation, passenger and freight, there was need for considerable improvement in the trolley voltage. There was on the system at this time 9,500 kw. in rotary converter and 3,000 kw. in step-up transformer capacity and there is now 14,500 kw. of rotary converter and 4,500 kw. of step-up transformer capacity, an increase of 52.6 per cent in converter capacity and 50 per cent increase in transformer capacity. With this equipment it is possible to handle approximately 100 per cent increase in alternating-current kilowatt-hours purchased. This is due to the fact that the new equipment was interspaced between the original substations, thereby reducing the amount of line loss and making available additional power for effective traction purposes. As shown in Table I, the total energy consumption per car-mile has been reduced from 5.78 to 4.31 kw.-hr. This reduction is due to a general improvement in operating efficiency, one of the factors of which is the substation interspacing but the exact amount for which this is responsible cannot be determined. The other figures in Table I will give a good idea of the rapid growth of the business of the company, and the graphic schedules reproduced herewith will show at a glance the service given for which power must be supplied.

TABLE I—GENERAL STATISTICS ON POWER CONSUMPTION TREND ON NORTH SHORE ROAD

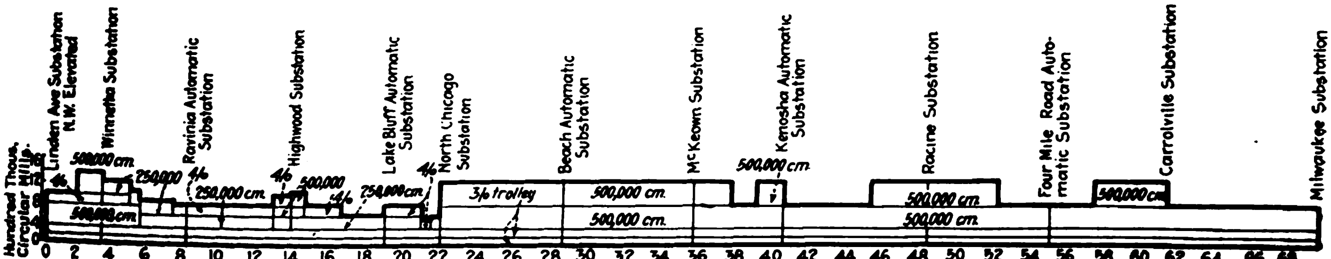
Year	—Car-Miles Operated— Passenger	Freight	Passengers Carried	A.C. Kw.-Hr. Used on Interurban System	A.C. Kw.-Hr per Car-Mile on Interurban System
1915	2,450,988	272,088	6,762,518	15,160,975	5.78
1916	2,830,317	348,320	7,459,689	17,892,122	5.83
1917	4,034,352	413,762	10,374,243	23,207,845	5.45
1918	5,355,632	517,744	11,875,249	28,481,021	5.05
1919	6,128,254	457,264	12,425,634	28,309,649	4.67
1920	7,074,419	887,399	13,388,238	29,314,722	4.31

LAKE BLUFF AUTOMATIC RAILWAY SUBSTATION, NORTH SHORE ROAD

Before this method of power development was entered into, consideration was given to raising the line voltage on part of the system to 1,200 volts, but this plan was abandoned on account of the excessive cost of changing car control equipment and old motor equipment. Consideration was also given to the installation of additional feeder copper, but this was also abandoned on account of the heavy cost. In an article published in the ELECTRIC RAILWAY JOURNAL of Jan. 11, 1919, I showed that it would cost approximately $650,000 to accomplish the same voltage betterment that has been made with interspaced substations, and fundamentally this would have been the wrong method of correction to apply. The existing feeder capacity is shown in an accompanying diagram, no change having been made since before 1916.

Power is purchased from two sources, which at times makes it necessary to do considerable high-tension switching from one power source to another, so that the automatic stations have had rather severe operating conditions.

Before going ahead with the installation of automatic substations, a careful study was made of installations already made at that time. Although our sub-



Hundred Thous. Circular Mills.
Linden Ave Substation N.W. Elevated
Wilmette Substation
Ravinia Automatic Substation
Highwood Substation
Lake Bluff Automatic Substation
North Chicago Substation
Beach Automatic Substation
McKeown Substation
Kenosha Automatic Substation
Racine Substation
Four Mile Road Automatic Substation
Carrolville Substation
Milwaukee Substation
500,000 cm.
250,000
250,000 cm.
4/0
500,000
250,000 cm.
3/0 trolley
500,000 cm.
500,000 cm.
500,000 cm.
500,000 cm.
500,000 cm.
500,000 cm.
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68
Distance in Miles

FEEDER CAPACITY DIAGRAM OF NORTH SHORE ROAD

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[*] Abstract of paper presented before Illinois Electric Railways Association in Chicago, March 16, 1921.

TABLE II—BEACH AUTOMATIC SUBSTATION OPERATIONS DURING JANUARY, 1921

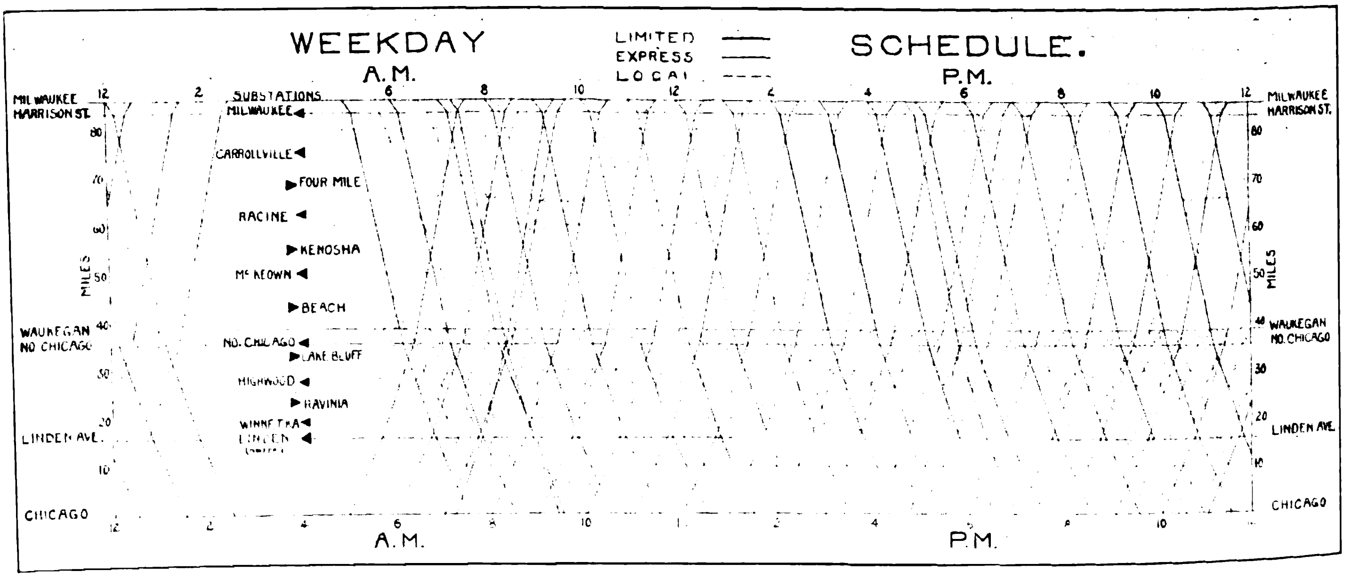
Day	Date	Hours Since Last Inspec'n	Hrs. Sta. Run Since Last Inspection	A.C. Kw.-Hr.	D.C. Kw.-Hr.	Number of Operations of Apparatus Since Last Inspection: Controller	Oil Switch	Contactors 18	Contactors 20	Contactors 21	Relay 27A	Thermostats 19	Thermostats Res.	Average per Hour: D.C. Kw.-Hr.	Average per Hour: Operations of Station	Remarks
Saturday	1	25-00	18-30	6,625	5,570	21	21	21	50	17	0	0	0	301.1	0.84	
	2	24-00	18-45	6,670	5,610	14	14	14	83	32	0	0	0	299.2	0.583	
	3	23-00	17-30	6,835	5,750	21	21	21	82	64	2	2	0	328.2	0.915	
	4	24-00	17-15	6,045	5,070	21	21	21	65	33	0	0	0	294.0	0.875	
	5	24-00	17-00	5,575	4,670	18	18	18	53	39	0	0	0	274.1	0.75	
	6	24-00	16-45	5,470	4,570	16	16	16	44	14	0	0	0	273.0	0.667	
	7	24-00	17-15	5,510	4,610	16	16	16	49	15	0	0	0	267.5	0.667	
	8	24-00	18-15	5,785	4,830	17	17	17	36	41	1	0	1	264.7	0.708	
Sunday	9	25-00	18-00	6,280	5,260	21	21	21	51	25	0	1	0	292.2	0.84	
	10	22-00	16-15	5,750	4,830	18	18	18	37	11	0	0	0	297.2	0.818	
	11	25-00	16-30	5,875	4,920	22	22	22	69	7	0	0	0	298.1	0.88	
	12	24-00	16-30	5,525	4,620	22	22	22	41	41	0	0	0	280.0	0.917	
	13	24-00	19-00	6,540	5,460	18	18	13	78	72	1	1	1	285.8	0.75	No. 18 contactor counters out of order.
	14	24-00	18-00	5,840	4,890	15	22	20	62	30	0	5	0	271.9	0.625	Oil switch counters out of order.
	15	24-00	17-00	5,875	4,930	18	22	18	50	59	2	0	1	290.0	0.75	Oil switch counters out of order.
Sunday	16	25-00	20-15	7,415	6,240	10	23	10	54	20	0	0	0	308.1	0.40	Oil switch counters out of order.
	17	22-00	18-30	7,140	6,010	3	6	3	56	13	0	0	0	325.1	0.136	Oil switch counters out of order.
	18	25-00	18-30	6,530	5,470	13	25	13	57	46	2	13	0	295.9	0.52	Oil switch counters out of order.
	19	24-00	19-20	6,280	5,270	9	24	9	49	15	0	0	0	272.2	0.375	Oil switch counters out of order.
	20	26-30	21-00	7,445	6,250	12	20	12	53	77	3	0	0	297.8	0.453	Oil switch counters out of order.
	21	24-00	16-45	5,680	4,790	24	31	24	43	42	1	5	1	286.1	1.00	Oil switch counters out of order.
	22	21-30	14-10	4,355	3,660	19	19	19	43	56	2	0	1	258.2	0.883	
Sunday	23	24-00	15-00	5,545	4,620	27	27	27	62	14	7	0	0	308.0	1.125	
	24	23-00	17-00	6,835	5,830	7	7	7	39	98	0	0	0	343.1	0.304	
	25	29-25	21-00	7,440	6,240	17	17	17	52	37	1	0	0	297.0	0.577	
	26	18-35	13-10	4,080	3,400	14	14	14	33	7	0	0	0	258.5	0.753	
	27	25-00	18-45	6,380	5,360	14	14	14	50	31	0	0	0	286.4	0.56	
	28	24-00	17-45	5,460	4,580	16	16	16	30	12	0	0	0	258.0	0.667	
	29	24-00	17-15	5,180	4,320	19	19	19	42	13	0	0	0	250.4	0.792	
Sunday	30	25-00	17-30	5,830	4,900	22	22	22	32	0	0	0	0	280.0	0.88	
	31	22-00	16-30	5,375	4,510	20	20	20	24	12	0	0	0	273.4	0.909	
Totals		743-00	544-55	187,170	157,040	524	593	524	1,568	993	22	27	5	8,915.2	21.919	
Average per day		23-58	17-35	6,037.7	5,065.8	16.9	19.1	16.9	50.6	32.03	0.71	0.87	0.16	287.5	0.707	

station erection has extended over almost four years, and other installations around the country have been carefully investigated, it has not been found advisable to change the design of building or the layout either on account of these investigations or on account of defects showing up in our own experience. A detail description of our substation design was published in the ELECTRIC RAILWAY JOURNAL in the issue already referred to. An exterior photograph of one of the substations and some interior views are shown herewith.

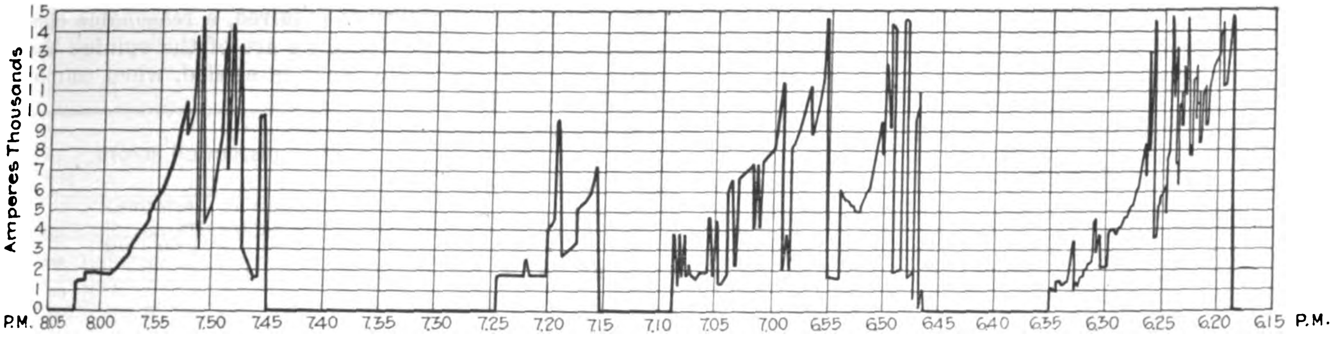
On account of the rapid growth of the load on our power system it was necessary to install the equipment in a temporary manner as hand-operated stations without waiting for delivery of the automatic control, and they were operated in this way while the installation of automatic equipment was being made. The first stations installed were those at Beach and Kenosha, followed by Four Mile, Lake Bluff, Libertyville and Ravinia; the last is just now being put in service. All of these stations are 25-cycle equipments except Ravinia, which is 60-cycle. All the 25-cycle stations are laid out for 33,000-volt service, but some are temporarily operating on 13,200 volts. The 60-cycle station is supplied from a 20,000-volt line, with provisions for 33,000-volt operation at some future date.

EXACT OPERATING DATA DESIRABLE

From the start it was apparent that it was very desirable to know what occurred in the station between inspection periods. Accordingly, a number of mechanical counters were attached to various pieces of the apparatus in such a manner as to record the number of operations. This gave a very close check on how the station was acting and up to a very short time ago no other checking method was available. However, the General Electric Company has recently devel-



GRAPHIC SCHEDULE OF NORTH SHORE ROAD FOR WEEKDAYS



TYPICAL TWO-HOUR RECORDING AMMETER CHART OF AUTOMATIC SUBSTATION

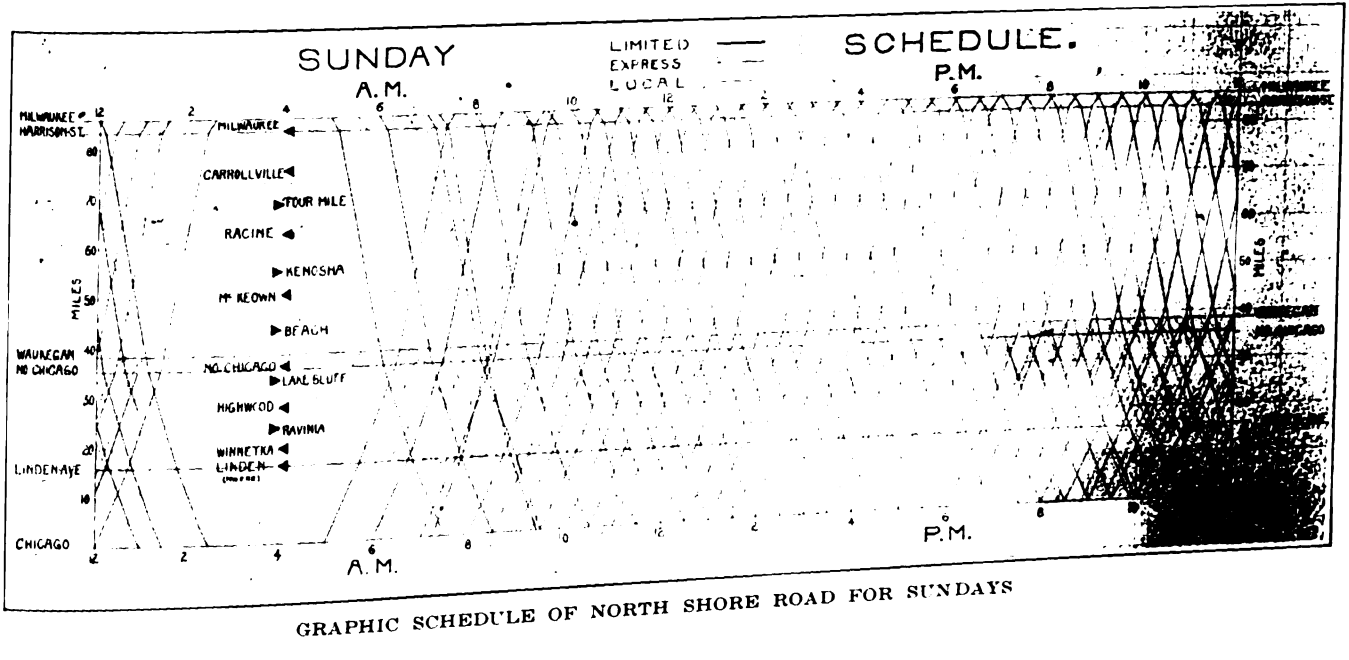
oped a recording instrument which gives a very complete record of station operation by means of an ammeter element and nineteen recording pens actuated by various pieces of the equipment, as shown in an accompanying illustration.

The inspector reads these various counters on daily inspection and enters them on a report card which is sent to the office and tabulated on a monthly sheet, Table II. In this way the various operations of the station can be followed from time to time. It was from records of this kind that the operating statistics of Table III were obtained. In addition to this record a log book is kept in each station in which these same readings are entered daily together with a report on all failures or unusual occurrences. A Bristol recording voltmeter chart is used for indicating station on and off the line and from this the time during which the machine is operating is calculated every day.

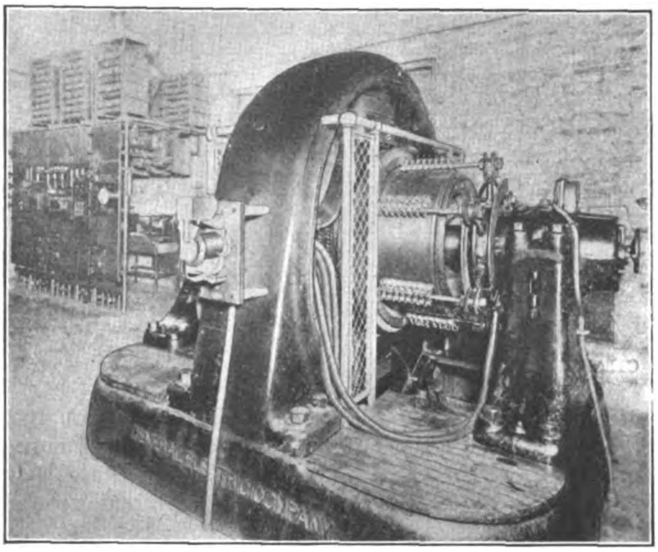
From this table it is quite apparent that the stations have been given a very severe tryout and if any serious defects existed they would have shown up by this time. On Kenosha station, which has made more than 33,000 operations since its installation, there has been no appreciable wear or excessive maintenance on any of the apparatus. In fact, the main contacts on which most of the wear occurs have never been removed, and from our experience up to date it is impossible to determine what the life will be or what the maintenance will amount to. As far as the number of operations are concerned, Kenosha station had had the equivalent of 22.7 years of service in a hand-operated station, assuming four operations per day in such a station. This means a corresponding heavy service on the balance of the equipment and the results speak very well for the correctness of design and ruggedness of equipment. The average load on the Beach and Kenosha substations is considerably higher than would be possible to obtain in hand-operated stations. This is due to the load-limiting resistances keeping down the momentary peaks, thereby making it possible to carry

TABLE III—AUTOMATIC SUBSTATION OPERATING STATISTICS

Station	Size Unit, Kw.	Date Started	Total D.C. Output to Jan., 1921	Total Hours Operated	Total Number of Operations	Total Operations of First Res. Contactor	Average Output per Operating Hour	Average No. of Station Operations per Day	Average Number of Operations of First Res. Contactor per day
4-mil	500	11- 2-18	1,948,600	9,712.8	24,709	9,298	200.6 Kw.	31.25	11.62
Kenosha	500	4-15-18	3,310,420	11,005	33,141	29,159	301.0	33.4	29.4
Beach	500	12- 5-17	4,926,745	16,854	21,562	56,387	292.0	19.4	50.2
Lake Bluff	1,000	2-26-19	3,782,030	11,726.8	7,196	8,520	323.0	10.65	12.6
Libertyville	300	12- 6-19	471,400	6,737	13,980	33,323	70.0	35.7	85.1



GRAPHIC SCHEDULE OF NORTH SHORE ROAD FOR SUNDAYS

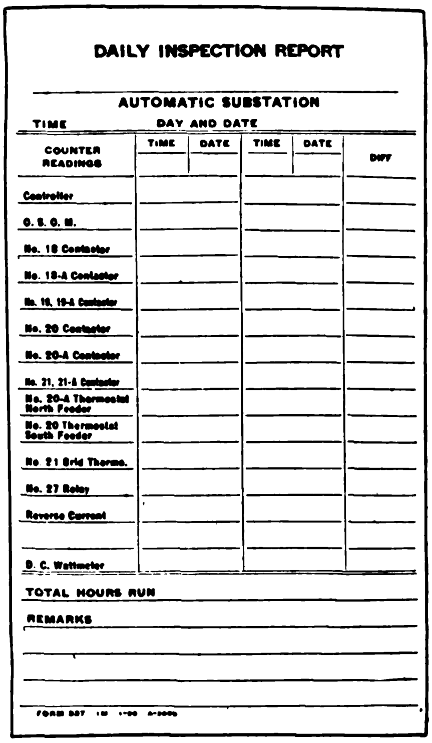


INTERIOR VIEW SHOWING LOCATION OF VARIOUS SUBSTATION EQUIPMENT

a considerably heavier load on automatic than on hand-operated stations. While this is a feature which could be applied to manual as well as automatic stations, it is nevertheless a regular feature of automatic equipment and this type of station should be given credit for it.

HOW MUCH INSPECTION IS NEEDED?

Among operators of this type of equipment there has been considerable controversy about the amount of inspection required and it has varied on different properties from daily to weekly. The amount required undoubtedly depends upon the load on the equipment, the reliability expected and seriousness of an occasional failure. From an inspection of our operating records, we believe that with as complicated apparatus as this, which performs so large a number of operations and where absolute reliability is required, a reasonable close inspection is needed. Hence we are of the opinion that daily inspection is about what is needed, when coupled with recorders which give an indication of what goes on between inspection periods. A typical section of a recording ammeter chart is shown in an accompanying illustration which indicates the character of load on a 500-kw. station. As the automatic substation design is only in its infancy, some failures were to be expected and some changes in design of apparatus required. But from a complete tabulation (Table IV) of these failures on the North Shore Road, it is quite evident that they have been comparatively few in number and of a minor nature. Since the causes have been located, a great many of these sources of trouble have been eliminated entirely. A summary of this tabulation shows that the failures per 1,000 operations of the various stations have been remarkably few. See Table V.



DAILY INSPECTION REPORT

AUTOMATIC SUBSTATION

TIME DAY AND DATE

COUNTER READINGS	TIME	DATE	TIME	DATE	DIFF
Controller					
O. S. O. M.					
No. 18 Contactor					
No. 18-A Contactor					
No. 18, 18-A Contactor					
No. 20 Contactor					
No. 20-A Contactor					
No. 21, 21-A Contactor					
No. 20-A Thermostat North Feeder					
No. 20 Thermostat South Feeder					
No. 21 Grid Thermo.					
No. 27 Relay					
Reverse Current					
D. C. Wattmeter					

TOTAL HOURS RUN

REMARKS

FORM OF DAILY INSPECTION REPORT USED ON NORTH SHORE ROAD

TABLE IV—RECORD OF FAILURES OF AUTOMATIC SUBSTATION EQUIPMENT ON C., N. S. & M. R.R. SINCE SUBSTATIONS WENT INTO SERVICE

			Numbers of Failures					
Name of Apparatus	Nature of Trouble	Permanent Remedy Applied	Beach Substatio	Kenosha Substation	Four-Mile Substation	Lake Bluff, Substation	Libertyville Substation	Total
Time delay cutout relay	Contacts burned	Redesigned relay head and substituted new contact metal	..	7	..	1	..	8
Time delay cutout relay	Coil burned out		..	1	1	1	..	3
Time delay cutout relay	Toggle failed to lock	Redesigned relay head	1	2	..	..	..	3
Time delay cutout relay	Out of adjustment		..	..	..	2	..	2
Instantaneous control relay	Open circuit		..	..	..	1	..	1
Instantaneous control relay	Resistance grounded		..	..	..	..	1	1
Instantaneous control relay	Chattering	New type relay substituted	..	..	..	..	1	1
Instantaneous control relay	Plunger stuck	New type relay substituted	..	..	1	2	..	3
Contact-making voltmeter	Stuck		1	..	..	..	..	1
Controller motor	Burned out		..	1	1	..	..	2
Controller motor	Commutator dirty		..	1	1	1	..	3
Controller	Poor contact of a segment		..	1	1	1	..	3
Controller	Brake stuck		..	..	..	..	1	1
Exciter	Polarity reversed		..	3	..	..	..	3
Resistance thermostat	Contact out of pivot	Thermostat redesigned	1	1	2	3	..	7
Resistance thermostat	Contact burned off		..	..	..	1	..	1
Oil switch	Motor burned out	Redesigned operating mechanism	..	2	1	..	..	3
Oil switch	Guide block broke	Redesigned block and fastening	2	3	..	..	..	5
Interlock on hand reset	Loose contact		..	..	..	4	..	4
Hand reset	Defective latch	Readjusted	..	6	..	..	..	6
Field relay	Screw loose on contacts		1	3	..	1	..	5
Field relay	Low voltage—would not close	Coil winding changed	..	..	1	1	2	4
Field relay	Grounded		..	..	1	..	..	1
Polarized relay	Poor contact	Contacts changed	..	2	1	..	..	3
Underload relay	Contacts burned	Contacts changed	..	3	..	..	1	4
Underload relay	Stuck open		..	..	..	..	4	4
A.C. no-voltage relay	Poor contact	Redesigned relay	1	1	1	..	..	3
Reverse-current relay	Burned out-lightning		..	..	1	..	..	1
Brush-lifting device	Coasting not enough or too far	Redesigned mechanism	..	..	..	24	..	24
Master relay	Poor contact		..	..	..	2	..	2
A.C. low-voltage relay	Resistance burned out		..	..	..	1	..	1
A.C. low-voltage relay	Broken lead		1	..	..	..	..	1
Load-limiting relay	Stuck		..	..	..	..	2	2
Load-limiting relay	Bad contacts		..	..	..	..	1	1
Controller motor contactor	Grounded		..	..	..	..	1	1
Field contactor	Burned contact		1	..	..	..	..	1
Totals			9	37	13	46	14	119

TABLE V—SUMMARY OF FAILURES

Station	Total Number of Operations	Total Number of Failures	Failures per 1,000 Operations
4-mile road	24,709	13	0.526
Kenosha	33,141	37	1.113
Beach	21,562	10	0.4638
Lake Bluff	7,196	46	6.392
Libertyville	13,980	13	0.929

The high average of one failure per 1,000 operations at the Lake Bluff substation, as shown in Table V, is due to defects which have developed in the brush-lifting device. These defects, however, have since been corrected, so that failure from this cause has been entirely eliminated.

From Table IV it is apparent that of the 119 failures, the causes for seventy-four have been eliminated by redesigning pieces of apparatus. The remaining failures are of the usual class found in all complicated apparatus and these can be kept at a minimum only by careful inspection and maintenance.

THE FINAL ANALYSIS SHOWS A SAVING

The final test of whether or not the automatic substation is to remain depends upon its ability to make a reduction in operating expenses. On the North Shore line this has amounted to approximately $41,351 after charging against the station all legitimate charges such as inspection, interest and depreciation on equipment, and taking credit for elimination of station operating labor and idle running losses, but not for any portion of the reduced line losses. This saving has been made on 10.87 station years of service, or $3,804 per station year. Expressed on a basis of kilowatt-hours converted, this amounts to a reduction of 0.2863 cent per direct-current kilowatt-hour output.

RECENT TEST YIELDS VALUABLE DATA

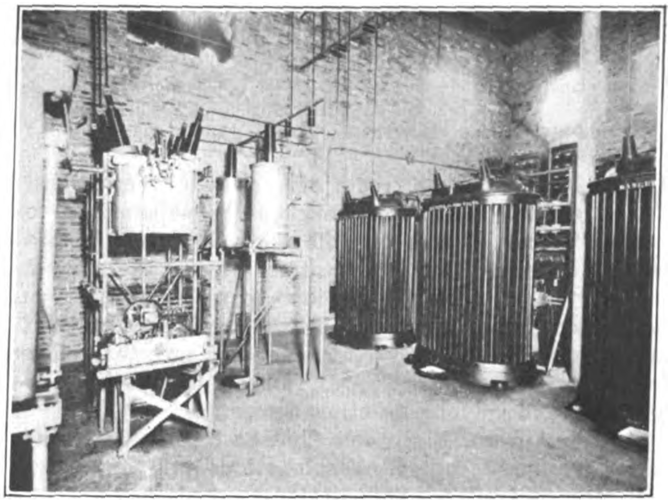
We have just completed a very comprehensive series of tests of three of these stations in conjunction with the General Electric Company for the purpose of determining exactly the losses which occur in the stations, due to automatic operation. During these tests a great many interesting facts were found which have done considerable toward increasing our confidence in the equipment and the savings which they make possible.

Table VI contains a summary of a forty-eight-hour efficiency run made on each of the stations under test, which shows the efficiency of the stations and the distribution of losses in the various parts of the equipment.

TABLE VI—SUMMARY OF 48-HOUR EFFICIENCY RUNS ON THREE SUBSTATIONS

	Kenosha	Lake Bluff	Libertyville
Capacity of converter	500 kw.	1,000 kw.	300 kw.
Total running time	1,271 min.	2,310 min.	2,219 min.
Running time, per cent of total run	44.2 %	80.3 %	77.0 %
Number of starts	69	4	26
Average length of running period	18.5 min.	9.6 hr.	1.4 hr.
Total input to station	7,536.7 kw.-hr.	16,080 kw.-hr.	4,108.5 kw.-hr.
Total output from station	6,130 kw.-hr.	14,218 kw.-hr.	3,200 kw.-hr.
Efficiency of station	81.5 %	88.5 %	78 %
Average load, per cent of machine rating	59.7 %	37.3 %	29 %
Time 1st resistor was in cir.	132 min.	19.3 min.	....
Time 2nd resistor was in cir.	23 min.	0.94 min.	....
Per cent converter output lost in resistors	2.2 %	0.48 %	0.2 %

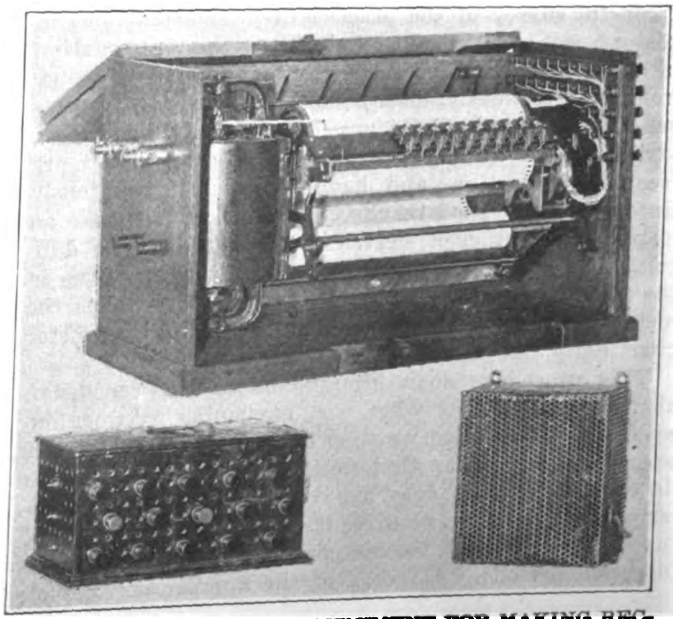
Percentage Distribution of Input to Station:	Kenosha	Lake Bluff	Libertyville
Total output to trolley	81.5	88.5	78.0
Total consumed by resistors	1.86	0.43	0.16
Total consumed by A.C. control, operating	0.16	0.11	0.27
Total consumed by A.C. control shutdown	0.041	0.006	0.027
Total consumed by A.C. control starting	0.016	0.0006	0.011
Total consumed by A.C. control stopping	0.003	0.00009	0.02
I^2R and core losses of control transformer	0.11	0.07	0.30
Total consumed by No. 32 relay	0.01	0.02	0.05
Total consumed by D.C. control	.38	.36	.85
Total consumed by converter in starting and going on the line	1.04	0.02	0.34
Total losses in converter and power transformers	14.88	10.48	19.99



ANOTHER INTERIOR VIEW SHOWING ARRANGEMENT OF SUBSTATION EQUIPMENT

The automatic substation has been one of the greatest developments in the railway power field in recent years and its advent has made radical changes in power distribution engineering which are going to result in higher efficiency and better operating conditions on properties where it may be employed. Its field of application is practically unlimited, but the details of application and modification which may be required to suit certain localities are problems which must be studied and worked out for each location. On first consideration the automatic substation appears to be a very complicated piece of apparatus, but when we consider that it performs practically the same function as multiple-unit car control has done for years under much more severe conditions than exist in a substation there is no reason why it should not prove entirely satisfactory.

Our own experience has borne this out and we are very well satisfied with the results obtained.



AUTOMATIC RECORDING INSTRUMENT FOR MAKING RECORD OF AUTOMATIC SUBSTATION OPERATION

A. E. & C. Automatic Substation Experience*

BY S. E. JOHNSON
Engineer Overhead Construction Aurora, Elgin & Chicago Railroad, Aurora, Ill.

MR. JONES' paper treats of a system where there is enough inspection work on the substations to warrant a crew of men for this work alone, and he has been able through his organization to compile data not only very valuable in the efficient operation of his own particular system but which can be used as a basis of calculation for other systems of like character. The follow-up system on causes of failures is especially interesting and valuable to other companies.

On the Aurora, Elgin and Chicago Railroad we have seven manually controlled substations and one automatically controlled. This station was originally manually controlled, but was changed over to automatic in September, 1918. It is located approximately 10 miles from the nearest hand-operated substation. An hourly schedule is operated both ways with trains consisting of one to three cars through the winter. During the summer months very heavy picnic service is operated on this branch, and these trains usually have about six cars.

SOME UNUSUALLY SEVERE OPERATING CONDITIONS

The service under which this station must operate during the summer months is very severe; I believe more severe than automatic substations were originally intended to serve. The starting current drawn by our particular car equipment is heavy and on account of the exceptionally long distance between substations, the automatic equipment must naturally take care of practically all of the current taken by trains until they are well away from the station. This made it necessary to set the thermostat on the line resistance grids so high that the grids would be at red heat before the machine would be cut off. By this means any cars in the vicinity of this substation are given power to move them regardless of overload.

When our station was placed in operation, the matter of regular inspection was given a great deal of study. A careful survey of the practice of other companies in this respect was made, and from the information gathered the period of inspection was found to range from daily to weekly, most companies, however, inspecting daily. We finally adopted the weekly inspection, partly because we had no organization to handle a more frequent inspection, and have followed it religiously since with very good results. In addition, we make an inspection after each electrical storm, though no difficulties have ever shown up. An operator who lives in the vicinity charges the lightning arresters, takes the meter readings and changes the recording voltmeter chart daily, but does no further inspection work.

This procedure soon brought us to the conclusion that we must know what was happening between inspection periods, and we soon developed and installed a special signal device that notifies the train dispatcher in case the station does not come in on the line properly when a demand requires it. This device has allowed us to forget about the automatic station between inspection periods. A record of the number of complete operations of the station is made by the use of a Bristol recording instrument. We have averaged one failure per 750 operations.

By the installation of automatic equipment at our one station we were able to save $11.90 per day in labor alone, and I feel certain a considerable amount in repairs, which we are unable to check. The average daily output has increased from 4,000 kw.-hr. per day to 6,500. This is due to the fact that under manual control a train starting at the station knocked out the breaker on the rotary and it was then impossible to close it again until the train was some distance away. Under automatic operation, however, the load-limiting feature permits the station to furnish power to the train continuously. Another advantage is that the service on this branch is improved, as we are able successfully to handle heavier trains under better voltage conditions.

The stations mentioned in Mr. Jones's paper operate a good many times per day, one in particular sixty-nine times. I believe that a station can operate too many times per day. In this particular instance, the station perhaps operated five or six times per hour during rush periods, and if this is true, I believe it would be advisable to install a device that would hold the machine in on the line during this period and thus save the wear and tear of these additional stops and starts.

On our system we have a period between 1:30 a.m. and 5:30 a.m. when there is no train service, but have deemed it advisable to hold the station on the line with a time clock to improve voltage conditions at our shop located about 5 miles away.

Automatic substations are now an accomplishment and no longer an experiment. They are truly reliable, more so in fact than manually controlled stations, and they will show great economy right from the start.

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*Abstract of written discussion on paper by C. H. Jones, abstracted above, read at meeting of Illinois Electric Railways Association, Chicago, Ill., March 16, 1921.

City Bank on Trade Conditions

THE bulletin of the National City Bank for March, 1921, has the following to say on what it calls "the great miscalculation which is tying up trade and industry at this time."

> Something has happened that has affected the buying power of millions of people, and other millions are trying to ignore it and think they can go on selling their own goods or services at the same rates as before. Trade is dull and millions of people are out of work because the adjustments that are necessary to restore the equilibrium are not made.
>
> Merchants refuse to reduce the prices of goods they have in stock, and perhaps argue plausibly in justification of their policy, but trade languishes and quicker witted competitors will replace their high cost goods with low cost ones and take the lead in the trade.
>
> Wage earners stand for the maintenance of wage scales, and as the public is unable to buy goods made upon that level of cost, the mills close down or run on half time, with a great loss of wages, without corresponding reduction in the price of the product to consumers, most of whom are wage earners.
>
> The printers of New York City wanted more wages last fall, and a committee of well-intentioned gentlemen selected to arbitrate the case awarded an increase by some process of reasoning which left the state of the printing business and equilibrium between the printing business and the general business situation entirely out of account. The result was that the wage increase, by increasing the cost of printing at a time when the public had less money to spend for printing, aggravated the situation and resulted in a reduction of employment and of actual wage payment.
>
> That illustrates the whole situation. It is shortsighted to be always thinking that the wages can be fixed by simply an agreement between employer and employees. There is a relationship between each industry and all the other industries which must be taken into account.

Profitable Conference of N.Y.E.R.A.

At the Quarterly Meeting Held in New York City on March 18 the New York Electric Railway Association Discussed Informally the Safety Car, Freight and Express Traffic and Valuation Matters—Inspirational Address Was Delivered by Homer L. Ferguson

INFORMALITY, frankness and a general willingness to contribute the results of experience were the characteristics of the twenty-fourth quarterly meeting of the New York Electric Railway Association, held at the Biltmore, New York City, March 18. The morning session was occupied by the reading of a paper on "Special Franchise Valuation" by L. R. Brown, engineer New York State Railways, Rochester, followed by an interesting discussion and a conference on "Solicitation of Electric Freight Business," opened by the reading of a contribution by T. H. Stoffel, Westinghouse Electric & Manufacturing Company.

At noon the members of the conference were entertained at luncheon by the association in a room adjoining the conference hall, after which the discussion was resumed with the one-man car as the focus of interest. No formal paper on this subject was presented. The program closed with an address on economic conditions and tendencies by Homer L. Ferguson, president Newport News Shipbuilding & Dry Dock Company, Newport News, Va.

Mr. Ferguson's remedy for the present condition of affairs is greater industry and economy in production, greater thrift and deflation of costs. Prices are not fixed by a mysterious influence, he declared, but by the laws of trade and finance. Waste and inefficiency in production must be removed. Overhead expenses should be reduced, companies must expect less profit and labor has to do its share in cost reduction, if this country is to meet world competition.

The usual evening banquet following the conference was omitted.

Mr. Brown's paper and the resulting discussion are abstracted below. A report of the remaining discussion will be given in a later issue.

Special Franchise Valuation

BY L. R. BROWN

Engineer New York State Railways, Rochester, N. Y.

THIS is an age of valuation. It is also an age of taxation. The two go hand in hand. The laws of New York State have for many years required each public service utility to submit each year a valuation of all its property, both real and personal, together with a report of gross receipts and operating expenses. The object is to furnish the state tax commission with information from which it can determine the value of the franchise.

Besides being of use to the state tax commission, this tax report furnishes an excellent opportunity for each company to make a valuable inventory and valuation of its property. For this purpose it should be very carefully prepared and revised each year. The electric railway companies of the State, especially the up-State companies, have not yet fully realized the importance and value of this report.

The tax commission at Albany is a very just and considerate one and has on its staff able engineers who are willing to give any company the best advice and aid in making the valuation as called for, and in compiling other information for the report. The commission allows each company to make its own valuation but insists that this be fair and reasonable. The commission advises that this valuation should approach original cost but recognizes the fact that most companies are unable to produce original cost figures and so has asked for "Cost to Reproduce New" and also for "Present Value Allowing Depreciation." By "Cost to Reproduce New" it appears that the commission means the cost to reproduce the property in its present condition but using unit costs that prevailed at the time the property was constructed, or at least using prices not inflated by the war.

The following is the "net earnings rule" which the commission applies to valuations and data submitted in the reports made by the various companies to determine the value of special franchises for tax purposes:

General Application.—From the gross receipts derived from the operation of the property deduct the operating expenses and a fair return upon the value of the tangible property, real and personal, necessary to the operation of the plant. The amount thus remaining should then be capitalized at a reasonable rate per cent to ascertain the intangible value which attaches to the operation. To this intangible value should be added the present value of the tangible property in the streets. The sum of this intangible value and the tangible value represents the value of the special franchise. This is a simple statement of the rule. Its application, however, requires some further elucidation.

1. The operating receipts should exclude all receipts that are not derived from the operation of the franchise; for example, the receipts derived from the operation of pleasure parks, sale of concessions, etc. Rents of lands and buildings not necessary to the operation of the franchise should also be excluded. In like manner the corresponding expenses in the conducting of these outside enterprises, which are dissociated from the operations under the franchise, should be excluded from the operating expenses.
2. The value which represents the investment in these outside enterprises should not be included in the value of the tangible property upon which the return under the rules is allowed.
3. The operating expenses should include taxes and a fair sum representing annual depreciation to a plant and equipment, which annual depreciation may not be covered by renewals and repairs during the year.
4. The rate of return to be properly employed must be determined upon the facts governing the degree of hazard or reasonable confidence in the enterprise, not being based upon speculation but upon the facts as demonstrated in the conducting of the business.
5. The rate per cent used for capitalization is usually assumed at 1 per cent rate higher than the rate of return, to compensate or allow for the uncertain circumstances which may be involved in the general question of appraisal.
6. If the nature of the business conducted is of such a character as to require an unusual amount of cash to be kept on hand as representing a working capital and therefore not available for investment or for dividends, it is proper that a reasonable amount of cash working capital should be included in the amount upon which the return is allowed. The amount of such cash must, of course, be determined by experience and knowledge of the actual requirement of cash for that purpose.

7. In determining the value of the tangible property, development expenses are not to be included, neither is the expenditure for paving, which attaches to the first cost of the installation of the plant to be considered a part of the value of the tangible property, although the amount which is actually expended for paving may rightfully be included in the amount upon which the return is allowed. However, after the intangible value has been determined, the item representing the cost of paving is not to be included in the value of the tangible property in the streets when the value of this tangible property is added to the intangible value to give the amount representing the value of the special franchise.

8. The intangible value attaching to the property as a whole having been determined, a proper apportionment of that intangible value must then be made as between that part of the intangible value which attaches to the operations in the streets and highways and that part of the intangible value which should be fairly attributed to the operations upon private right of way. The most equitable apportionment of such intangible value is necessarily upon the basis of per cent of gross receipts derived from the operations in the streets and highways and the per cent of such gross receipts as is derived from the operations upon private right of way.

9. The proper intangible value attributable to the special franchises having thus been ascertained, a still further apportionment of this intangible value must be made between the different tax districts where the property used in connection with the franchise is represented in more than one tax district. This apportionment between districts should also be made upon the basis of gross receipts derived from the operation in each tax district.

10. The value of the tangible property used in connection with the special franchise must, of course, be ascertained for each tax district and the value of such tangible property be added to the intangible value ascertained for that tax district to form the special franchise valuations for a particular tax district.

11. It frequently occurs that there are circumstances and conditions which may be peculiar to any one property, such as burdens upon the franchise imposed by the authorities who grant the franchise, as well as other circumstances and conditions surrounding the property which must be considered in connection with the application of the rule. The net earnings rule must, therefore, be applied with great care and must be employed with sufficient elasticity and judgment as will insure a fair and equitable determination of the value of the franchise.

An important fact concerning the application of the rule is that the net earnings used are the average net earnings over a period of five years and not the net earnings for the current year. This method avoids any great variation in franchise valuations and taxes, because the net income which is bound to fluctuate is the main determining factor in computing the franchise valuation under the rule.

Valuation for tax purposes is entirely different from valuation for rate-making purposes, and the two should not be confused. For tax purposes, the commission wants a stable valuation using unit prices ranging over a considerable period of time so as to represent as nearly as possible the investment cost of the property. The values furnished to the state tax commission by the companies should not include intangibles, for these are taken care of by the intangible value computed by the commission from the net earnings. Valuations for rate-making purposes on the other hand have been generally recognized to include certain intangible values such as "going concern" and "cost of financing." The proper basis of unit prices to use on a valuation for rate-making purposes apparently has never been definitely decided upon but it seems logical to assume that a company be permitted to earn a fair return on a valuation based on prices obtaining over the period of time during which the rates are in force. Thus it will be seen that valuation for tax purposes and for rate purposes are two very different propositions.

In 1917 the New York State Railways had an appraisal made of its property on a "cost-to-reproduce-new" basis using pre-war prices, most of which were based on a price trend extending over a period of ten years or more. The New York State Railways are a consolidation of some fifty original companies for most of which there are no cost construction data. Not only that but a considerable amount of the property has been reconstructed since the original construction. This valuation made by a competent engineering firm formed the only basis to indicate the real worth of the property. It also gave the company for the first time what was really its actual value.

The value of the property, which had been reported to the state tax commission each year, was considerably less than the new appraisal value even when the intangibles were not considered. Realizing this a meeting of the officials of the company was called and it was decided that in fairness to themselves and to the public the values in the tax report should be changed to agree with the appraisal of the property even though it might mean an increase in the taxes paid by the company. No intangibles were included in the tax report but the values included items of overhead covering such costs as legal expenses and interest and taxes during construction.

To show the reasonableness of the prices used in the appraisal and subsequently in the tax report, several of the principal elements are here listed:

Girder rail per ton	$39.60	Copper base per pound	$0.185
T-rail per ton	30.40	Concrete per cubic yard	3.27
Untreated wood ties each	0.67	Common labor (city), per hour	0.204
Yellow pine lumber, per M.ft.	42.75	Common labor (interurban), per hour	0.184
Steel shapes per ton	28.80		
Brick pavement per sq.yd	2.30		

Using these unit prices one mile of standard track construction without pavement and consisting of 7-in. plain girder rail, wood ties and crushed stone ballast cost about $28,000. This included about 35 per cent of tangible overhead which was added to the field costs.

When these figures were submitted to the state tax commission in March, 1918, they reasoned that it would be unfair to increase the New York State Railways valuation when the values that had been previously submitted were already as high as those submitted by other electric railways in New York State. At the suggestion of the commission, the New York State Railways are this year reducing the tangible overhead costs from 35 per cent to 20 per cent of the field costs, but the cost per mile will still be higher than the other roads of the state. Unit prices of material given on the reports of other companies agreed very closely with those of the New York State Railways. Discrepancies were found to be due to the very small labor costs for excavation and grading and for track laying and surfacing. Figures of thirty cents per foot of single track were used in some cases for track laying and surfacing in city streets. Another reason other companies reported lower figures than the New York State Railways was because they had entirely omitted such field costs as tools and construction appliances, superintendence and field accounting, inspection, liability insurance, contingencies and omissions. Likewise they had omitted altogether or used very small percentages to cover overhead costs such as legal and administration expenses and interest and taxes during construction.

A careful study of the net earnings rule of the state tax commission shows that an increase of valuation on the tax report does not necessarily increase the franchise valuation. Whether it is increased or decreased depends upon the relation of the "Present Value Allowing Depreciation" of the property to the net earnings. If the net earnings are very small, say almost zero for a period of five years, then the intangible value as computed according to the net earnings rule would be zero. In this case the franchise value would equal the "present value" as reported on the tax report and any increase of the one would increase the other. On the other hand, if the net earnings were reasonably large and the valuation small, then an increase in values on the tax report would increase the allowable return and thus reduce the net earnings. This would decrease the intangible value of the property which when added to the tangible property according to this rule might give a franchise value less than before. Generally speaking, a change in the value of the property on the tax report will have but little effect on the franchise value for what is gained or lost on the tangible will be offset by a loss or gain on the intangible if the net earnings rule is rigidly applied.

If to increase the values on the tax report to a reasonable figure would have very little effect upon the taxes it would seem good policy for the electric railways to revise their tax valuations. Would the electric railways of the state be willing to accept a fair rate of return on the value of their property as they themselves report it to the state tax commission? Can the companies reproduce their lines new for anywhere near the amount reported on their tax reports even with unit prices prevailing ten years ago? Why should not the electric railways of the state get together on this proposition and report fair increases in their taxes?

DISCUSSION OF MR. BROWN'S PAPER

The discussion on the above paper included three distinct items: (1) Valuations on a reproduction basis, (2) franchise tax as compared with a gross earnings tax and (3) paving requirements.

It was said that the franchise tax now assessed is a more favorable method of taxation than the gross earnings tax, which even if only 1 per cent would in many cases figure about the same as is now being paid by most companies in New York. If it were 2 per cent the amount would be more except in the case of the Interborough.

As things are now, the tax commission uses some discretion in cases where companies cannot meet the assessments and has only recently granted the Brooklyn Rapid Transit Company a $10,000,000 reduction in the value of its franchises. Under the gross earnings tax there could not have been any such relief. The real trouble with the franchise tax is in its administration. The tax itself is satisfactory. The companies which feel they should have a reduction in this tax should send their operating men to explain the facts to the commission and not depend upon a lawyer for this purpose.

It was further pointed out that in the valuations submitted to the tax commission care should be taken to see that only such property as is actually in service is included. Deductions should be made for obsolete equipment and also for power plants, when power is purchased. In figuring depreciation, the straight-line method should be used and full information covering such deduction should be attached to the report. In figuring property value the commission has to work on an average per mile of track and if companies figure too low or too high, such an average is affected according to the method of weighting used.

The need of valuations has been overlooked in the past, but it must be borne in mind that valuations for taxation, rate making and issuance of securities differ, due not to the inventory but to the inclusion of various "overheads," depending upon the purpose for which the valuation is made.

Figures for the value of railway property should be kept by the railway and the tax commission in a uniform manner, first according to the Public Service Commission allocation of accounts and then subdivided further according to municipalities through which the railway operates.

PAVING REQUIREMENTS

Paving requirements under the present law compel the street railway to pave and maintain between its tracks and for 2 ft. on either side. In the discussion these requirements were held to be unfair, as there is no valid argument why a railway should lay pavement only to have this worn out by others. The rails in the streets are really of advantage to a community, for heavy trucking can track these rails. Then, too, in winter with snow on the ground they provide a highway, while at other times the parking of vehicles at the sides of the street drives the traffic onto the railway strip. Two bills on paving are now before the State Legislature, one of which repeals the present law, while the other makes it more onerous. The paving situation, especially along state highways, should be, it was said, under a new commission, and the present law repealed. If the actual facts could be presented to the Legislature, some relief, it was believed, might be obtained, and it was voted to refer the whole subject of paving to the association's legislative committee.

Attention was also directed to a bill now before the Legislature, which, while only applying specifically to the Borough of Queens, might after passage be construed to apply elsewhere. This bill gives the local authorities in Queens the right to compel relocation of tracks even though the railways had laid their rails where ordered by previous municipal authorities. The reason for this is the refusal of the New York & Queens County Railway to change from an unpaved side location to a paved center location on a street that was being improved with paving.

A speaker asked if it was possible for the State highway maintenance tax to be saddled upon the trolley lines by the various municipalities. It was held to be a legal matter and attention was called to the bill now before the Legislature which, while it was believed to be unconstitutional, would allow this maintenance tax assessment to be passed along to the railway the same as any other assessment.

In Massachusetts, it was brought out, the law requiring the railways to pave between the tracks and outside had been repealed. The railways now maintain pavements only where it is so specified in their original franchises. As for changes in grade, location, etc., required due to state highway construction or reconstruction all such expenses are borne by the state except the renewal of ties, rails, etc. The railway company usually does its own work and renders bills for the proportion to be paid by the highway commission.

New England Outlook Is Bright

Speakers at Club Meeting Refer to Better Conditions—Governor Cox Elected Honorary Member of New England Club

THE twenty-first annual meeting and banquet of the New England Street Railway Club were held on Tuesday of this week at the Copley-Plaza Hotel, Boston. Edward Dana, general manager Boston Elevated Railway, was elected president of the club for the coming year. The other officers chosen were: Vice-presidents Ralph D. Hood, Haverhill, Mass.; W. J. Flickinger, New Haven, Conn.; T. H. Kendrigan, Manchester, N. H.; T. B. Jones, Burlington, Vt.; Alfred Sweeney, Lewiston, Me., and Walter C. Slade, Providence, R. I.; secretary, John W. Belling; treasurer, Fred F. Stockwell; members of executive committee, I. A. May, C. H. Wood, W. W. Field, F. B. Walker, L. P. Morris, A. A. Hale and L. D. Pellissier.

There were about 400 guests at the banquet in the evening. I. A. May, retiring president, presided and introduced his successor, Mr. Dana, who after expressing his appreciation of the honor of election said he wished to be of service to the club and pledged his best efforts throughout the coming year. Continuing he said:

"If I lived in the past I would fancy myself arguing before the old Public Service Commission about plans which would save money and still give better service, and waiting months for a decision, instead of presenting facts to a Board of Public Trustees who act promptly and get results.

"The members of this club have been a credit to the industry during its years of uphill fight and now that the future promises to be so bright I know that I will have the co-operation of every single member (and some new ones also) in the effort to make the record of this year one of continued progress and greater results."

The assets of the club were reported by President May as $4,000, including more than $3,000 in cash.

The toastmaster was Alonzo R. Williams, general counsel Rhode Island Company, Providence, and a descendant of Roger Williams, who was referred to as a pioneer in interstate commerce. Mr. Williams gave a humorous account of the qualifications of a railway attorney and was very happy in his presentations of the other speakers. At the conclusion of his introduction of Governor Cox of Massachusetts, the Governor, on motion of Ralph D. Hood, was unanimously elected an honorary member of the club. The only other honorary member of the club is Past-President William H. Taft.

Governor Cox expressed his pleasure at this election and also at the note of optimism in Mr. Dana's address. Too often today, he said, we hear predictions of failure and despair, but in his opinion there are just as great opportunities today as ever for those who are willing to give service.

Mayor Andrew J. Peters of Boston, who spoke next, voiced the thought that there is now a clearer understanding by municipalities of the needs and possibilities of service of local transportation companies, and he declared that no contract between two such organizations can be successful unless it is to the advantage of both sides.

Senator S. P. Spencer of Missouri, the next speaker, referred to the difficulties which the electric railway industry had experienced during the last few years and to the recognition by the Federal Electric Railways Commission of the essential nature of the service and the need for a sympathetic understanding of the problems of the industry by the public. He then discussed pending immigration legislation.

The toastmaster then called upon Arthur Gaboury, superintendent Montreal Tramways. Mr. Gaboury referred to the visit of the club to Montreal last June and suggested that the club this summer might like to go to Quebec, visiting Montreal on the way. The meeting closed with a vote of thanks to the speakers, proposed by President May.

Is Public Ownership Inevitable?

THE principal speaker at the meeting of the Philadelphia section of the American Society of Civil Engineers, held on March 7, was William S. Twining, director of city transit, Philadelphia. While the address related in part to the local transit situation, the speaker took the occasion to outline the results of his broad study of the subject of urban transportation in general, and its relation to municipal government as at present constituted. Mr. Twining said that although he has been considered by some as favoring municipal supply of transit service, he does not favor this under present form of governmental administration, but he believes that because of certain conditions which he outlined public ownership is inevitable in large cities. Service at cost, he considers, is simply disguised public ownership and operation, for the private corporation under such conditions is no longer a free corporate agent, but a de facto agent of the public. The service-at-cost plan is simply a halfway station on the road to public ownership and operation, a temporary expedient aiming to utilize existing machinery for transit service while governmental machinery is being evolved.

According to Mr. Twining history shows that transit development is proceeding in three fairly well-defined stages, as follows: The first was the era when transportation was considered a private business with which government had little or no concern; the second stage was inaugurated when transit service began to be regarded as a semi-public business, as it is regarded today. The third and final stage, only recently entered upon, is that of its universal recognition as a public business and function of government. Today transit service is in an unsettled condition principally because of the conflicting opinions as to its nature. Paraphrasing Lincoln, transit service cannot exist half government and half industry. The public would not countenance any proposal to abolish governmental control, so that the only alternative is full public ownership in the supply of the service as a branch of municipal activity.

Under the Public Service Company laws of Pennsylvania, for instance, the state assumes responsibility for the quality of the service to be rendered by the corporation and determines what are reasonable rates for the service, so that the management to all intents and purposes is state management. But if the capital used in public service is practically placed under the care of the state and all business risk disappears, the necessity for stockholders also disappears. If with commission regulation, we must submit to all the disadvantages of public management, complicated by functioning through corporate officials, why not simplify the relationship by having public management function direct?

Mr. Twining thinks also that the report of the Federal Electric Railways Commission is pessimistic as to the continuance for long of private ownership.

Safety of Passengers in Steel Cars*

Analysis of a Large Number of Accidents to Cars Shows that Their Superstructures Should Be Strengthened—Wire Cables Appear to Offer an Effective Means of Arresting Progress of an Invading Car Before It Penetrates Far Into the Structure

BY FRANK M. BRINCKERHOFF
Consulting Engineer, New York City

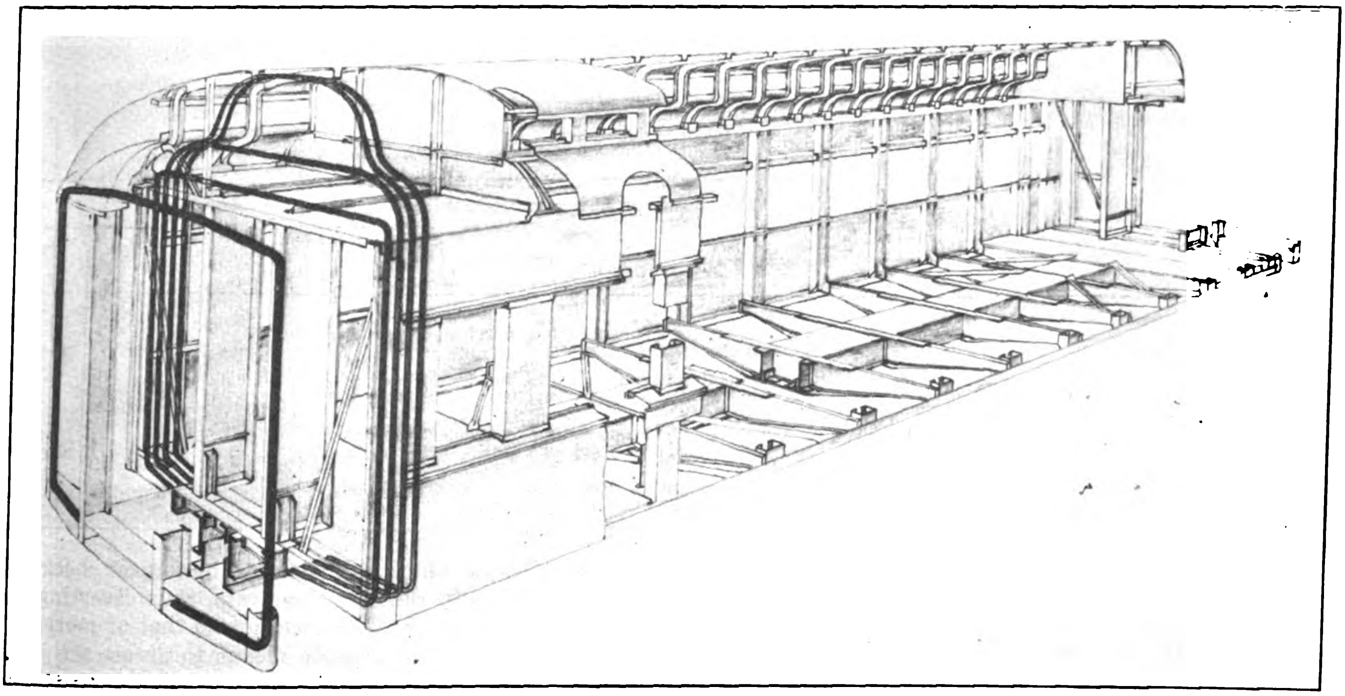
THE general adoption of steel in place of wood in the construction of passenger train cars some fifteen years ago marked a distinct advance in the art of car building. Various problems arose during the change, and many have been successfully met. The two most important problems to be solved were and still are safety of passengers and weight of complete car.

That some steel passenger cars are heavier than the wooden ones which they displace in service seems to be indicated by the significant fact that the adoption of steel passenger-train cars was frequently accompanied or closely followed by the purchase of heavier locomotives to handle the new passenger equipment.

With regard to the problem of safety of passengers, I wish to give in condensed form the results of an extended investigation of the behavior of passenger train cars when derailed or in collision and to point out that, while the steel structure affords much greater safety to passengers than did wooden car bodies, modifications can be made in the superstructure of steel cars which will greatly increase their ability to resist destructive shock.

It was natural that the early design of steel car structures should follow conventional lines and that the evolution from the all-wood car to the all-steel car should be gradual. It is now possible, however, to examine the photographic records of typical accidents to passenger trains and profit by past experience when designing and building new equipment.

Examination of many illustrations of accidents of the derailment and sidewiping class soon led us to the conclusion that distribution of metal which would strengthen the superstructure of the car as compared to the strength of the underframe was highly desirable. During the last ten years or more, 315 cars have been built according to a system evolved by us, with the purpose constantly in mind to produce a car body structure of great strength but still of a weight not in excess of wooden car bodies of similar size and equipment. The side-frame members of these cars are organized in the form of a girder extending from the side sill to the side plate at the roof line, a height of 7 ft. 6 in. or more. The underframe of this system includes center sills adequate to sustain the shocks of collision, draft, etc., but instead of being of the fish-belly type designed to be self-supporting between truck centers, as is the usual custom, the center sills of this system are uniform in section throughout their length and are supported approximately every 6 ft. by heavy cross-bearers between the high girder side frames. The center sills, being thus supported, have no measurable deflection and are therefore superior in capacity to



PERSPECTIVE VIEW OF CAR FRAMEWORK, SHOWING PROPOSED ARRANGEMENT OF CABLES FASTENED TO CENTER SILL resist end shock to those of much greater weight and depth which are self-supporting between bolsters. By this co-operation between side frames and center sills a great reduction in weight per car is accomplished and yet a much stronger body structure results.

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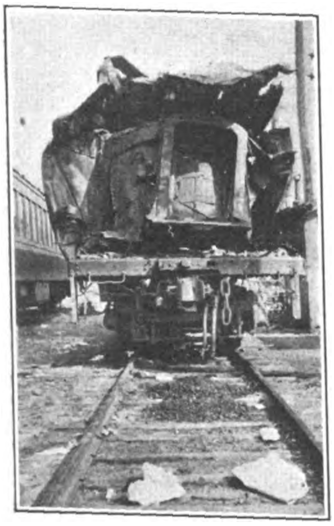
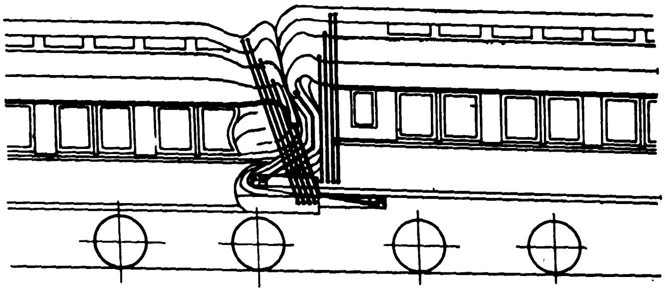
*Abstract of a paper presented before the New York Railroad Club, March 18, 1921, followed by a summary of the resulting discussion.

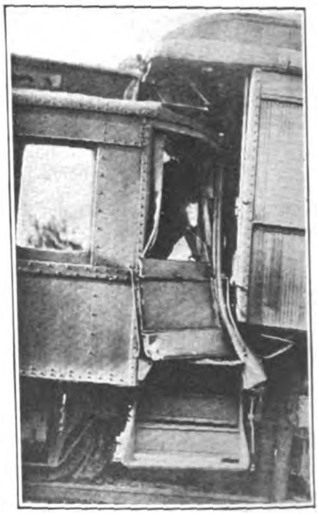
The ends of the bodies of these cars are reinforced against the stresses of impact to an extent considered appropriate to the service in which the cars are employed. Some of those cars being electrically operated in tunnel service, others in suburban steam and suburban electric service, others in through line steam service at high speeds and in heavy trains.

The system of reinforcement of the ends of the car body co-ordinates the body end walls with the members of the high girder side frame and roof in the form of a rectangular tube with ends barred to prevent penetration by an impacting body. This is accomplished in the through-line car by the introduction of two new members.

1. An anti-telescoping tie plate extending across the car from side plate to side plate and lengthwise of the car for about 6 ft., forming a flat ceiling for the lavatory, passageway and saloon and being securely riveted to the plate of the high girder side frame.







TYPICAL VIEWS OF RAILROAD WRECKS AND EFFECT OF PROTECTIVE CABLES IN RESISTING PENETRATION

At left, the joints connecting the side walls, hood and roof are inadequate to resist the bursting stress exerted on the invaded structure by the invading body.

At right, the underframe of the invading car over-rides the underframe of the invaded car, the point of contact being a foot or more above the floor.

The sketch in the center shows the effect of the protective cables in resisting penetration of one car by the other.

2. Special deep piers forming the posts for the door in the end of the car body. These piers are approximately 21 in. deep and, as in some classes of accident they may be subjected to tension, the web plates of these piers pass through the upper tie plates and also through to the underframe and are together with their flanges securely riveted to each of these members.

The corner posts and the adjacent side posts of the car body are also specially designed to withstand the shock of cornering collision.

Careful analysis of some typical photographic records of railway wrecks lead to the following conclusions:

1. The underframe of the modern steel passenger car is adequate to withstand the shock of the most violent collision.

2. The underframe of the invading car over-rides the underframe of the invaded car and wedges its side walls apart, the point of impact being a foot or more above the floor according to the upward angle assumed by the over-riding underframe.

3. The superstructures of steel cars fail to protect the passenger space, when over-ridden in collision by a car having a steel underframe, because of the relative weakness of the invaded superstructure as compared with the heavy underframe of the invading body.

4. The joints connecting the side walls, hood and roof are subjected to tension because the invading body having penetrated between the side walls, exerts a bursting stress on the invaded structure. The members composing the roof are always light in section and the joints connecting them to the side walls equally inadequate to resist the heavy tension stress of collision.

5. The structure of the invading car is subjected to compression, and as the joints connecting its members are better able to resist compression than the invaded car structure is to resist tension, the invading car body is seldom seriously damaged.

Accurate computation of the forces expended in a collision between trains is practically impossible. Two reactions, however, occur in all rear-end collisions, which can be used roughly to gage the violence of the shock, namely: (1) Depth of penetration by the invading car, and (2) the distance the standing train is driven ahead by the force of the collision.

With these reactions in mind it seems highly desirable that the invading car be restrained from penetration by some device which will cushion the impact shock and impart motion to the standing train, thus diverting the force from the work of destruction to that of motion.

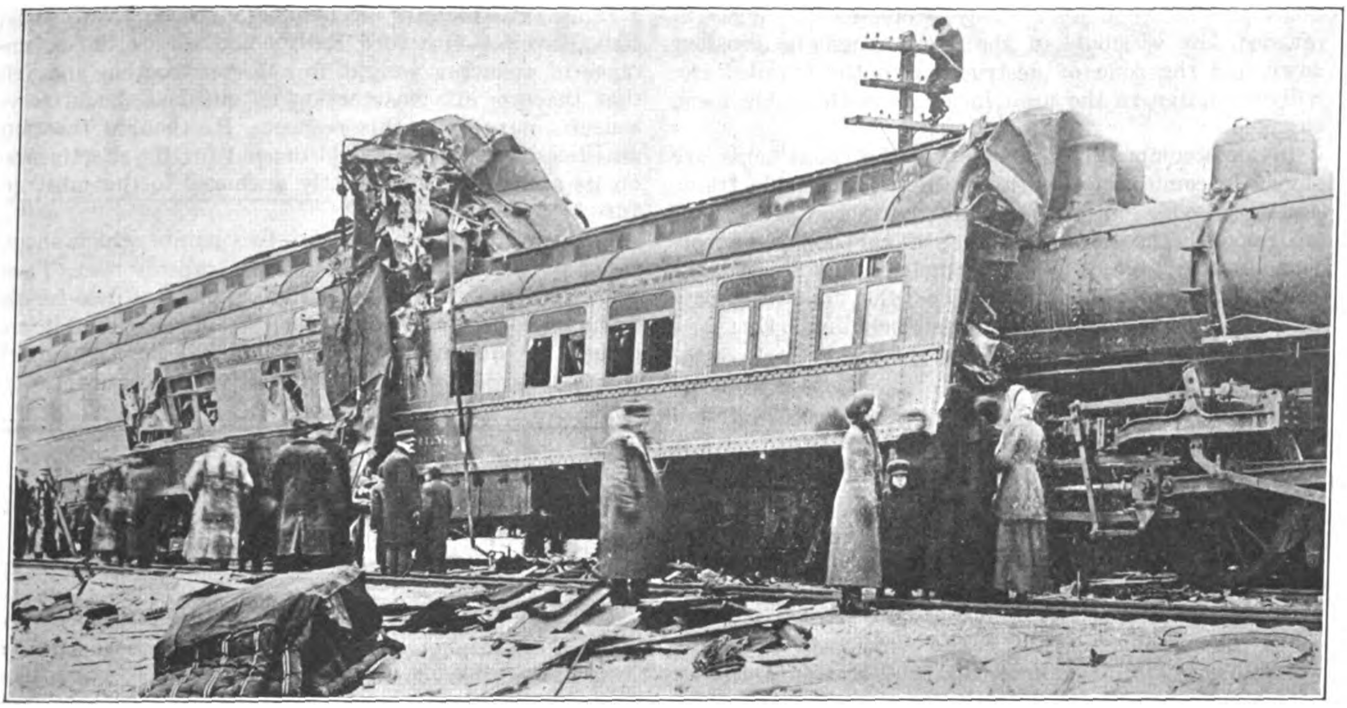
The problem is to provide means to arrest the progress of an invading car before it penetrates deep into the structure, meantime transmitting the force of the collision to the standing train to set it in motion.

The essence of this problem is the element of time, and the structure best adopted to solve the problem must contain members which will act to resist penetration at the vestibule end and interpose a rapidly increasing resistance to the progress of the invading car.

The essential characteristics of a member best suited to accomplish the above ends are: (1) Flexibility to avoid shearing; (2) elasticity to avoid abrupt stressing; (3) high ultimate strength in tension to resist the bursting stress exerted by an invading car.

Manifestly the material best adapted to meet the above requirements is wire cable. The manner of introducing the wire cable in a car structure may vary considerably. One form may be as follows:

A wire cable anchored to the underframe of the car passing through the vestibule buffer sill, up through the vestibule corner post, across the hood, down the opposite post, through buffer sill to anchorage point at underframe.



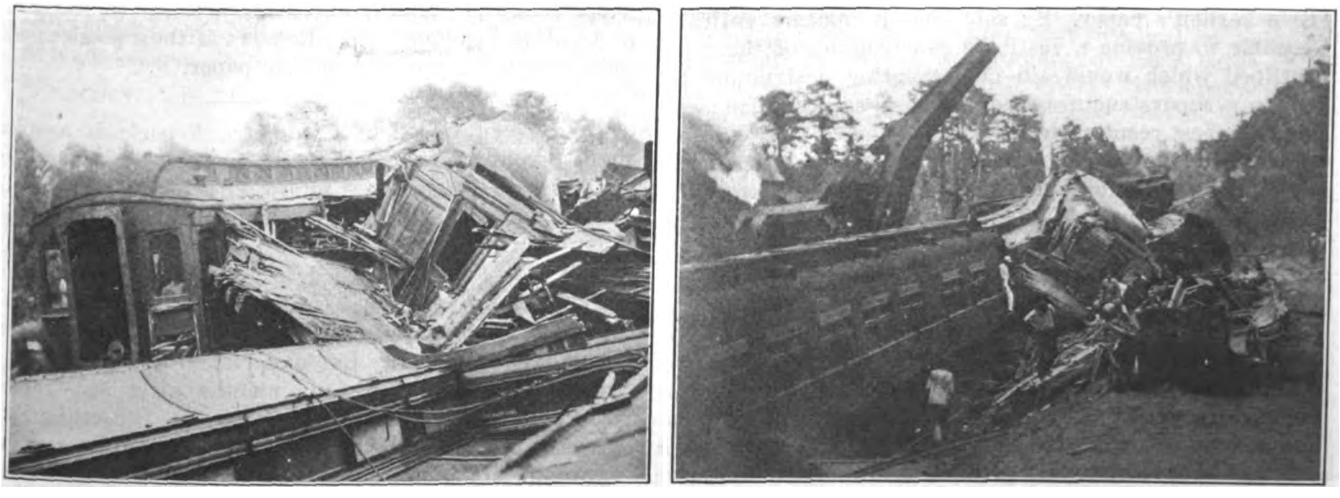
THE PENETRATION OF THE LOCOMOTIVE SELDOM EXTENDS THE DEPTH OF THE VESTIBULE. THE GREATEST DAMAGE OCCURS WHERE ONE CAR OVER-RIDES ANOTHER

The loop is thus distended in such a manner that the vestibule end of an invading car will penetrate within the loop. The initial shock of collision will be met by the vestibule end posts. When the resistance of these end posts is overcome and as the invading body progresses, the cable loop, together with the members of the invaded vestibule, will be drawn in and down against the vestibule of the invading body, crushing both within the confines of the loop.

The more resistant the structures thus crushed, the greater will be the energy absorbed and the greater will be the pull exerted by the cable, through its anchorage in the underframe, to impart motion to the mass.

The design further provides for a second group of cables, imbedded in the body corner posts and body end frame, to act as a second line of defence against the invading car. Should the force of the collision be not completely dissipated through the resistance of the vestibule end posts and the cable in the vestibule end, the invading car body will next encounter the high resistance of the body end wall, and the second group of cables will come into action upon being encountered by the invader. The second group of cables, being also anchored to the underframe and distended in loop form, will also draw the structure of the invaded car down and in upon the invader and similarly impart motion to the mass. This second group of cables will also act to draw downward and inward the roof and sides of the invader.

The arrangement of the cables is purposely such that it is impossible to bring an abrupt stress on them. They are distended in an approximately rectangular loop by members which, when subjected to collision shock, are bent and distorted by the cable which is of superior strength to any member with which it is associated except only the center sill to which it is anchored. For example, the combined tensile strength of the cable loops shown in the illustration is 2,000,000 lb., and therefore equivalent to the ultimate strength of center sills having a cross section of approximately 50 sq.in.



WHEN THE UNDERFRAME OF ONE CAR OVER-RIDES ITS NEIGHBOR THE UNDERFRAME ACTS AS A SHEAR AND SPLITS THE SUPERSTRUCTURE OF THE INVADED CAR. THIS DERAILMENT OCCURRED AT A SPEED OF ABOUT 50 M.P.H.

Consequently when a car body protected by cables is invaded, the vestibule of the invader will be crushed down and the zone of destruction in the invaded car will be limited to the area inclosed by the cable loops engaged.

In an accompanying illustration the cable loops are shown in combination with our high girder side frame and body end reinforcement as first described. This we consider the strongest form of car body construction in use today. When completely equipped with cable loops, this design provides the following path of resistance to penetration by an invading body:

1. A rigid vestibule end wall having as high initial resistance as practicable.
2. Cable loop, inclosing the vestibule end wall and acting to retain the structural members in the path of the invading body, upon the failure of the initial resistance of the vestibule end wall.
3. A rigid body end wall including the strong piers at the doorway and the deep body end reinforcing plate, collectively more than five times the section of the vestibule end.
4. The second group of cables which will act to prevent disruption of the body end wall structure and any further penetration.

The resistance effected by the cable loops is cumulative and the ultimate resistance will not be reached until the wreckage of both vestibules is compressed in a tangled mass within the confines of the loops engaged. The crumpling of the structural members within the cable loops will act to cushion the shock. The resistance will increase rapidly in a series of steps beginning with the resistance afforded by the rigid vestibule end posts and reaching a peak equal to the accumulated resistance of the four stages in the path of resistance above described. The body end structure being of much greater strength than the vestibule end structure will insure that the vestibule structure must be practically destroyed before the initial resistance of the body end structure is overcome and the second group of cables called upon to resist further penetration. I believe that only in cases of the utmost violence will the body end of the invaded car be crushed in and the ultimate resistance of the main cable be developed.

DISCUSSION OF MR. BRINCKERHOFF'S PAPER

James E. Howard, engineer-physicist Interstate Commerce Commission, opened the discussion of Mr. Brinckerhoff's paper. He said that it appears entirely feasible to provide a vestibule construction of the type outlined which would aid in preventing destruction of the car superstructure and increase safety. He said that the best results would be accomplished by providing a flexible means to reduce disastrous effects of accidents at comparatively low speed, but he felt that at extremely high speed it would be almost impossible to prevent destruction. He expressed the belief that the dissipation of the effect of collisions should take place outside the confines of the car body and that the outer end and the vestibule should be given careful consideration. His understanding was that steel wire cable advocated by Mr. Brinckerhoff was not intended as a substitute but as an adjunct to the present type of construction. A great advantage of such cable is its flexibility which enables it to take short bends. Its greatest usefulness would be in transmitting shocks to some heavy members of the car structure.

James C. Hassett, mechanical engineer New York, New Haven & Hartford Railroad, dwelt on the advantages of reducing weight in car construction and felt that the type of construction as outlined should serve a useful purpose in this respect. He thought that any anti-telescopic device would depend for its effectiveness on its ability to be efficiently anchored to the substructure of the car.

L. B. Stillwell brought out two points which should be of particular interest to electric railway men. These were that this type of construction offers a field for the reducing of weight of car bodies and also that it provides an underframe which would be particularly adapted to the installation of electrical equipment.

Association News

Committee on Valuation Meets

THE initial conference of this year's American Association committee on valuation was held at association headquarters on March 19. Those present in addition to Chairman Martin Schreiber, Public Service Railway, were C. F. Elmes, Sanderson & Porter, New York; G. W. Gillespie, Associated Gas & Electric Companies, Ithaca, N. Y.; W. H. Maltbie, United Railways & Electric Company of Baltimore, and W. H. Sawyer, E. W. Clark & Company Management Association, Columbus, Ohio. Acting Secretary J. W. Welsh also attended the meeting.

Two subjects, both of which were suggested by last year's committee in their report, were up for discussion. One of these was on the uniform procedure of appraisals. The consensus of opinion of those present was that the forthcoming report should cover in detail as far as possible the economic procedure to be followed in making appraisals with the idea of pointing out what parts of the property should be most carefully inventoried due to the amount of investment involved. The other subject was the rate of return. It was planned that a discussion would be submitted by one of the committee members for analysis at the next meeting.

As this issue of the ELECTRIC RAILWAY JOURNAL goes to press the Engineering Association committees on equipment and building and structures are in session at association headquarters. Reports of their sessions will be given in a later issue of the paper.

In a recent issue of *Commerce Reports* is a statement about the necessity of modern transportation facilities in Harbin, a Chinese city of 300,000 population. It says that both Japanese and Russian companies attempted to obtain the contract for a street railway, but it was finally awarded to a Chinese concern. The specifications call for 8 miles of double track and 5 miles of single track, with an overhead trolley system. The Chinese company has undertaken to have a part of the line in operation four months after construction work has been started and to pay 30 per cent of the gross receipts to the municipality as soon as cars are running. It is unreasonable to suppose that receipts will exceed expenditures for several years after the completion of the tramway.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Sliding Scale Franchise

Committee of Engineers at Duluth Suggests This as an Incentive to Economical Management

After two months of work a committee of six Duluth engineers has drafted a service-at-cost franchise which it has submitted to the Civic Council of Duluth and to the Duluth Street Railway for consideration as a fair and reasonable solution of the city's railway problem.

The proposed franchise provides that the dividend return to the company shall vary inversely with the fare charged on the railway as an incentive to economical operation.

FRANCHISE SUBMITTED TO RAILWAY

A copy of the franchise has been placed in the hands of the Duluth Street Railway for comments and suggestions. The engineers will then consider all changes and in an amended form will resubmit the draft of the franchise to the Civic Council. After the franchise is finally amended to the satisfaction of the member bodies of the Civic Council, which include both business and labor organizations of the city, it will be presented to the City Council and will likely thereafter go to the people for a vote.

The outstanding feature of the franchise is that the city is permitted to retain broad rights of regulation over fares, service and improvements, while the company would be rewarded for good performance by being allowed increased dividends as the fares might decrease. The measure creates the office of supervisor of street railways in the city government and to take the place out of politics it is stipulated that the appointee to this office must be qualified with at least eight years experience in railway work, five of which must be in the capacity of an executive.

FIVE-CENT FARE POSSIBLE

The new franchise provides that dividends shall be paid only on the actual value of the company's property—a figure to be agreed upon later from computations covering a period of the last five years. The measure would therefore entail a recapitalization of the company to eliminate any possibility of "watered stock," which seems to be a bone of contention in the present street railway fare controversy.

The committee of engineers asserts that a preliminary valuation of the company's property has convinced it that by recapitalization the company can charge a 5-cent fare and still earn dividends of 8 per cent. As stated previously there would be a sliding scale for fares and dividends, one going up as the other went down, or vice versa.

With reference to the amortization provision of the franchise it has been stated that the length of the grant is twenty-five years. The franchise provides that if at the end of ten years the city should decide to purchase it would only be necessary to raise the fare 1 cent, thereby creating a fund out of which the property could be purchased. At the end of fifteen years the property would automatically become the city's without bond issue or any further expense.

An arbitration provision in the franchise would make recourse to the courts a last resort for the settlement of railway problems. Rates of return, service and the question of the use of traction facilities would be taken before members of this arbitration board. The city charter of Duluth already provides for arbitration of labor disputes between the company and its employees and the franchise follows in line with the city charter.

The present franchise of the railway expires in 1931.

New York's Transit Relief Measure Before Governor

The Assembly of New York on March 22 passed the Governor's transit bill by a vote of ninety-one to fifty-six. The Senate had already passed the measure, which now will be sent to the Governor for final action. W. Ward Smith, secretary to the Governor, has announced that Mr. Miller will give a public hearing on the measure at noon on March 29.

Debate on the measure brought out fiery statements. Assemblyman Jesse of New York City, a Republican, declared the Legislature's action would bankrupt the party and that Democrats might be in the majority in the Assembly in the next Legislature.

All the Democratic Assemblymen and the Socialists voted against the proposed measure.

Assemblyman Reiburn, New York City, Democrat, started the seven-hour debate by asserting the bill to be the "most brazen and bold" ever introduced in the Legislature. In the course of his remarks he said:

> The measure seeks to foist upon the people of New York City obsolete street cars and run-down railway equipment. It seeks to take away from the people any possibility that they might in the future earn a few per cent interest on the $300,000,000 invested in their subways.
>
> You Republicans are taking away the last vestige of home rule. You are attacking the faith of contracts, and the men who are putting this over will be in danger of the safety of their own property. You are committing the greatest crime against the people. You are taking their property away without due process of law.

Thompson's Plan Heard

Lively Hearing and Embarrassing Questions at Session on Chicago Traction Issue

As a result of a public hearing held before the Illinois State Legislature on March 15 it was announced that several important amendments would be offered in connection with the plan of Mayor Thompson for "people's ownership" of the Chicago Surface Lines and a 5-cent fare. It is understood that the Mayor of Chicago will agree to changes in his bill which will provide for a referendum vote prior to the granting of additional taxing powers for the purpose of paying a deficit in operating expenses; a referendum vote if the question should arise of absolute purchase of street railway property in the "transportation district"; provision for a lower fare than 5 cents if this becomes possible; referendum vote to decide whether the $25,000,000 now in the "traction fund" should be turned over to the "district."

MAYOR HIS OWN SPOKESMAN

Mayor Thompson as well as Special Counsel Cleveland and Barrett spoke on behalf of the proposed legislation. They had to answer some embarrassing questions, and when Attorney Cleveland was asked why the present utilities commission, which is favorable to the city administration, did not take steps to establish a 5-cent fare at once he said:

> As long as the present utilities act is on the statute books we must abide by it. Repeal the utilities act and we can start something.

The Mayor stated positively that the city could operate the surface lines at a 5-cent fare at a profit. Attorney Cleveland was asked why it is not intended to include the elevated lines in the plan, and he replied that inasmuch as these roads were organized under different laws and owned their right-of-way it would not be policy to attempt to put them into the initial plan.

Attorney Cleveland also expressed the opinion that the surface lines could at least have made operating expenses in the past year under a 5-cent fare. When he was asked if he thought it right to spend the taxpayers' money to pay any part of street car fares he said:

> If the taxpayers can be forced to furnish the money to build boulevards for the rich who ride over them in automobiles it will be perhaps just as well for part of the taxes to be spent in a way that will give the great mass of the people some benefit.

One objection was that the bill creates a new taxing body while a great number of taxing bodies are already operating in Chicago. Further consideration of the bill was deferred.

Taxpayers Not Restrained

Suit by Fourteen Residents of Seattle in Municipal Railway Fight to Proceed to Regular Trial

In a decision handed down on March 13 Federal Judge Jeremiah Neterer denied the motion sought by the Puget Sound Power & Light Company, Seattle, Wash., for a temporary injunction to restrain the fourteen taxpayers suing the city in Superior Court from doing any act which might result in causing a breach of the $15,000,000 railway contract, or default in payment of the interest on the bond issue. Judge Neterer held that there is no controlling force in the statement made by attorneys for the company that the state court is without jurisdiction, and should be enjoined from proceeding in the taxpayers' action.

Judge Neterer held that the taxpayers' action in the Superior Court is to protect the general fund of the city from invasion for the purpose of depleting the special fund for any purpose. The recourse of the plaintiff, he held, is clearly to maintain the integrity of the special fund.

The court refused to enjoin the state court in proceeding in this matter and held that it is presumed to have full jurisdiction. The taxpayers, Judge Neterer held, are not proceeding against the special fund, which is separate and distinct from the general fund. The temporary restraining order against the fourteen taxpayers, issued on Feb. 21 and continued on March 1, has accordingly been dismissed.

ANOTHER HEARING FIXED

Attorneys for the Puget Sound Power & Light Company, following Judge Neterer's decision, immediately filed a new motion in the U. S. court, asking again for a temporary injunction against the taxpayers. The new motion asks that a temporary injunction issue, restraining the taxpayers, and each of them "during the pendency of the above entitled cause from instituting any suit against the plaintiff or making the plaintiff a party to any suit which it is or shall be claimed, that any provisions of the bonds issued by the city of Seattle, under ordinance 39,025, are invalid, or that alleges or claims that the city of Seattle was not obligated, out of the gross revenues of the municipal street railway system to pay into the special fund, created by such ordinance, the principal and interest of such bonds as provided by such ordinance."

The new motion was set to be argued on March 21.

Boston "L" May Run Buses

The Boston (Mass.) Elevated Railway has petitioned for permission to own and operate motor vehicles which do not run on tracks or rails. The matter was brought to a head by a notice from the city of its intention to repave Market Street, Brighton. This would make necessary relaying of the elevated's tracks on this street at an estimated cost of about $85,000. Inasmuch as only 1,700 people use this line daily, the trustees of the road decided that the expense was prohibitive.

If the pending petition is granted, operation of electric cars on this 1½-mile line will be discontinued and instead two buses will be operated, whether 16 or 25 seaters has not yet been decided. Fare will be the same, with better headway.

It is said that from time to time, as it becomes necessary, to rebuild the tracks on poorly patronized lines the elevated may again have recourse to the jitney franchise, but at the present time the Market Street line is the only one where the change is considered necessary.

One-Man Car an Issue in Pennsylvania

R. H. Horton, traffic engineer of the Philadelphia Rapid Transit Company, appeared recently before a committee of the Pennsylvania House in opposition to a bill introduced in the Legislature making it unlawful to run or operate or permit to be run or operated any car on a street passenger railway with a crew consisting of less than two men.

He said that the bill would affect the Philadelphia Rapid Transit Company in three ways: (1) In the operation of safety cars; (2) in the operation of trains of surface cars; (3) in the operation of subways and elevated lines. He showed that all three of these methods of operation as at present conducted by the company are safe, economical and advantageous. In conclusion he said:

> We realize that this committee is not so much interested in maintaining economical conditions for Public Utility Companies as in protecing the lives, interests and rights of the citizens, but I wish to point out that if this bill is enacted it will not make street railway transportation any safer, but these companies will be obliged to employ more men to do work which is not useful and we maintain that every man not doing useful work is a charge on the community and no less so than if he were in the Almshouse. Particularly is this so in this case because the laws of the State, enforceable through the Public Service Commission, limit the amount of return which a street railway may earn, but in limiting it state that these companies should earn a reasonable return upon a fair valuation of the property. That being the case it means that the citizens will pay the operating expenses of these companies and a reasonable return and it also means that every legitimate economy which can be made in those operating expenses will immediately reflect itself to the advantage of the citizens in that it means improved service or a smaller bill that they will have to pay.
>
> I present for your consideration the fact that through advancing costs service has been removed from 1,596 miles of electric railway track in the United States during the past three years, and 931 miles of track of this has been junked. Upward of 5,700 one-man cars are in use and were it not for their proved safe, economical operation, many communities would be entirely deprived of transportation.
>
> Street railways in Pennsylvania have not had an easy time through the period of the war or the reconstruction period following, and I believe that the Legislature very clearly sees that all legitimate economies which the railways can make should be encouraged and not condemned.

The Philadelphia Rapid Transit Company owns twenty-five safety cars which are all operated on what are known as the Darby, Media and Chester division.

Nominations Rejected

New Jersey Legislature Fails to Confirm Governor's Selections—New Names Advanced

New Jersey's Public Service Commission has most certainly become the plaything of politics. Within the state itself the various moves that have been made in connection with the commission are all well known, but they do point a moral elsewhere. One of the latest developments was the failure of the Legislature on March 20 to confirm as commissioners two of the three men previously nominated for places on the commission by Governor Edwards, a Democrat and a hold-over. Since then, however, another chapter has been added by the Senate confirming on March 21 the nominations of Judge Harry V. Osborne and former Judge John J. Treacy, Democrats.

SENATORS PLAY POLITICS

The men who had been rejected for appointment were James A. Hamill, Jersey City, former Congressman, and Joseph E. Hoff, Princeton. The refusal of the Republican majority in the Senate to confirm Mr. Hamill and Mr. Hoff was put upon the ground that the appointees were not men of affairs, possessing the qualifications needed by public utility commissioners. Intimations that political considerations, among them a desire to embarrass the administration, prompted the Senate action were resented by the Republican members of that body. It is, however, significant that in confirming the appointment of Harry Bacharach, former Mayor of Atlantic City, the Senators supported the only Republican nominated.

Last September the Governor removed the old commissioners from office on the charge of neglect or misconduct. This the commissioners resented. They questioned the right of the Governor in the courts. The Supreme Court upheld that official. Appeal was then taken to the Court of Errors and Appeals. That body likewise sustained the Governor. The board, however, continued to function as a regulative body until the Supreme Court decision affirming the "ouster" was rendered on Dec. 27. Since then there has been no regulative body acting. Meanwhile the Legislature passed a measure amending the utility act so as to curtail the power of the Governor in the future by making the removal of commissioners possible only through impeachment.

EMERGENCY LEGISLATION PENDING

Matters have been complicated still further by a provision in the utility law that changes in rates filed with the commission and not acted upon within three months shall go into effect automatically. In consequence of this clause the Public Service Railway will be in a position, if it so desires, to put into effect 10-cent fares throughout New Jersey on April 1. Emergency legislation is pending, however, which would meet the situation thus arising.

Municipal Ownership Urged

Author of New Orleans Bill Says Persons Interested in Preserving Private Ownership Have Forced Issue

Former Senator E. M. Stafford, delegate to the State Constitutional Convention from the eleventh ward of New Orleans, La., and sponsor for an ordinance intended to place the local railway system in the hands of the city, disclaims hostility to present security holders, but says the public has lost faith in eastern transportation "Greeks" bearing gifts.

SEES CITY OWNERSHIP ONLY SOLUTION

On the contrary, he says, as much as he was formerly opposed to public ownership, just so insistent is he now that with proper safeguards municipal ownership furnishes the only solution of the problem. He maintains that the railway itself has forced the hand of the municipality through the present broken down system of transportation, discredited and unable to finance itself to function properly. He contrasts the management of the old water-works company with the present management of the Sewerage & Water Board, and asks pointedly: "Who would want the old water-works system back again?"

He said in part:

> In New Orleans the hand of the municipality is being forced. If private persons had run the railway system satisfactorily the subject would never have come up for discussion. In the railways matter public ownership is being forced by those who have loudly protested against such ownership.
>
> On one hand we find a broken down system of transportation, discredited and unable to finance itself to function properly, and on the other hand we find a patient, suffering community which has to put up with a decrepit system, and to pay increased rates for inferior service.
>
> Public ownership of this utility is the only solution for the tangled situation. Please bear in mind that public ownership is not a theory advanced by radicals, but is forced on the municipal authorities by the failure of private ownership. The problem of readjustment appears too large for local financial interests, and the public has lost faith in eastern transportation "Greeks" bearing gifts, whose management of a great public utility has caused the public to lose faith in public utility investments. The credit of the city seems to be the only solution. The people must have better service and at a reduced cost.
>
> We remember how the old water-works company was managed. It gave us muddy river water and poor service and defied the people, just as the railway is now doing, until the state authorities took charge of the matter. Who would want the old water-works system back again? Surely public ownership of this utility has been a success.
>
> As much as I was formerly opposed to publish ownership I am now convinced that with proper safeguards it is the only solution of the great problem that has been forced on the people of New Orleans for solution.
>
> I am not determined on the passage of the ordinance without amendment. I realize that the time of the convention is short, and if the people are to obtain relief through its efforts the matter must be placed before it in time to secure the best thought of the members of the body.

SERVICE-AT-COST OPPOSED

The Building Trades Council of New Orleans has filed a protest with the Commission Council against the adoption of the cost-plus plan of operating recommended by the eastern representatives of the security holders of the New Orleans Railway & Light Company. This method had also been approved by the special masters in chancery, appointed by the judge of the Federal District Court, as one of the means of solving the railway problem. Commissioner Maloney, of the public utilities committee of the Commission Council, is himself rather lukewarm in his support of the cost-plus plan.

The citizens' advisory committee at New Orleans has asked the public to help straighten out the railway tangle. This appeal is made by and through Hugh McCloskey, chairman of the advisory committee and former president of the New Orleans Railway & Light Company.

Labor Surplus on Coast

There is a surplus of labor available for electric railways on the Pacific Coast. The Pacific Electric Railway, Los Angeles, has announced that it is on the point of refusing additional applications and the United Railroads, San Francisco, has ceased counting the number of applications received. As matters stand now the labor turnover is comparatively low and the morale is greatly improved. The United Railroads employed less than twenty men in the month of January.

A strike recently of union employees of the Great Western Power Company, called almost without warning, was promptly broken and after a few days the company was able to recruit more men than were needed.

Union labor, however, exerted a powerful influence at the California State Capitol. The King tax bill, referred to previously in the ELECTRIC RAILWAY JOURNAL, proposes an enormous increase in the taxation of large corporations, public utility corporations included; the proposed eight-hour law would increase the operating cost of the electric railways of the State by many millions of dollars annually and the anti-safety car law, well camouflaged but nevertheless purely a labor measure, would prohibit the operation of the 268 safety cars now in service in California. The King tax bill, while it did not originate with the union organizations, was supported by that element.

One in Fourteen Has an Auto

Western states have taken to the automobile much more rapidly than has the East and South, according to data secured by the Omaha Chamber of Commerce from the state departments handling automobile registrations in each State. There are now about 7,500,000 automobiles in the United States or an average of one for each 13.8 persons, according to the figures compiled. Trucks are included with pleasure cars because many states do not segregate the types of vehicles. California heads the list with one car for every 6.2 persons. Iowa ranks fourth with 7.9, New York thirty-fifth with 18.6 and Mississippi last with 41.1. Of the first 25 on the list, twelve are western states; the last 10 are practically all southern or southeastern states.

Power Matter a Problem

This and Wage Contract and Interurban Railway Operating Agreement Consume Attention at Toledo

While Toledo's bus regulatory measure lies slumbering in Council the officers of the Community Traction Company and Commissioner W. E. Cann have before them the matter of a power contract, new wage contracts, and the framing of interurban contracts.

POWER RATE CONSIDERED HIGH

The power contract, submitted by the Toledo Railways & Light Company and signed by officials of the Community Traction Company, has not been approved by the commissioner. He said he felt the rate was too high. The Rail-Light is asking 2.35 cents a kw.-hr.

This matter of the rate will be left entirely to Prof. H. E. Riggs of the University of Michigan, who has completed a survey of the local generating and distributing properties as a basis for a street lighting rate. The legal aspects of the contract have been passed upon by the city law director, who has picked what he considers a number of defects in the agreement.

Representatives of city and the company will sit down and iron out differences as soon as Mr. Riggs reports. If they cannot agree the Public Utilities Commission may be called in to establish a rate. In event they do not act the matter is submitted to arbitration.

The new wage contracts submitted to President Frank R. Coates, of the Community Traction Company, are practically identical with those of last year, which expire April 1. No increases in wages have been asked. The men are receiving 54 cents for first three months, 56 for additional six months, and 60 cents maximum at the present time. The company officials have not made any announcement concerning their attitude on the wages asked.

For the purpose of framing the contracts under which all the interurbans will operate in Toledo a committee has been named consisting of Commissioner W. E. Cann, representing the public; W. S. Roger, general traffic manager of the Detroit United Railway, representing the interurbans, and H. T. Ledbetter, representing the traction company, which owns the city lines. The ordinance provided for a ninety-day period for getting the contracts ready.

PASSAGE OF BUS ORDINANCE PUT OFF

The bus ordinance has been opposed by some union labor representatives but it is favored by the carmen's union. For three weeks now the vote on the ordinance requested by the Mayor, Commissioner and other city officials to regulate, bond, license, and determine routes for buses has been postponed from week to week. At each session Council has been beset with a lobby of bus owners.

Railway Plan Expounded

Assistant Manager of D. U. R. Speaks in Behalf of Detroit's Proposed Service-at-Cost Ordinance

E. J. Burdick, assistant general manager Detroit United Railway, on March 4 outlined before the Detroit Engineering Society the proposed service-at-cost ordinance which his company has prepared to submit to the voters of Detroit on April 4, through its initiative petition. He went into detail relative to the points wherein the service-at-cost plan differs from the cost-plus system, which has proved unsatisfactory in so many cases.

Preliminary to discussing the terms of the service-at-cost ordinance, Mr. Burdick gave figures which indicate the magnitude of the Detroit United system, and presented a brief résumé of the past dealings between the city and the company. The statement was made that the entire Detroit United system comprises about 1,000 miles and serves nearly one-third of the population of the state of Michigan.

Only the high points of the ordinance were touched upon by Mr. Burdick, with all references to politics strictly excluded. He explained that the thirty-year grant mentioned in the service-at-cost ordinance is not a franchise as the city has full control and right to purchase at the end of any year and the right to lease at the end of any year after the fifth year. The valuation of the property upon which the city, according to the ordinance, would guarantee a 6 per cent return is to be fixed by a board of arbitrators and cannot exceed the 1919 appraisal of $31,500,000. On this same valuation the city is to set aside monthly a sum sufficient to provide 2 per cent per annum to be placed in the city's sinking fund and to be used at the discretion of the city.

After dwelling briefly on the principal features, Mr. Burdick invited questions from engineers present. Some interesting questions were raised regarding the provisions of the ordinance and were fully explained in turn. Mr. Burdick was emphatic in his statement that there is no "colored gentleman in the woodpile." The ordinance, he said, is an earnest attempt on the part of the Detroit United Railway to settle Detroit's street car question once and for all along fair lines.

New Utility Court Planned in Iowa

Another court to interpose between the Iowa public utilities and their constituents is provided for in the Springer bill which has been adopted in the House of Representatives. The bill proposes to create a court of public service composed of three district court judges appointed by the chief justice of the Supreme Court of the State to review upon appeal all disputes between cities and public utilities as to rates and service. It grants to every corporation which comes under its plan an indeterminate permit to operate, terminable by the court of public service, whenever the court considers its continuance against public interest.

All light, power, gas and electric railways come under the provisions of the bill but telephone companies are excepted. An attempt to exempt Des Moines City Railway from the indeterminate franchise feature was defeated. If the bill should become a law both the Des Moines City Railway and the Des Moines Gas Company cases would probably come before the new court.

Electrification May Save Road

The Chamber of Commerce of Kansas City, Kan., has interested itself in a recent project to keep the Kansas City-Northwestern Railroad operating. The road has been in receiver's hands and the possibility of its being junked seemed very likely. A movement is now under way, however, to prevent this and to electrify the road, operating trains from the municipally owned electric light plant in Kansas City, Kan. L. H. Chapman, commissioner of water and lights in Kansas City, has stated that the city could afford to make a very low rate for power to bring about the electrification of the line. An engineering firm of Chicago agrees with Mr. Chapman that the project is a feasible one and that business men should not overlook so great an opportunity to continue the road in operation. Before anything tangible can be done funds must be raised to liquidate debts incident to the receivership.

Connecticut for a Square Deal

Results of a state-wide referendum by the Connecticut Chamber of Commerce indicate public opinion in Connecticut to be strongly in favor of legislation looking toward solution of the electric railway problem. This referendum follows a special report on electric railway conditions of the State compiled after nearly two years' work by a special committee consisting of Morgan B. Brainard, Hartford; Arthur L. Kimball, New Britain; R. W. Perkins, Norwich; Percy T. Litchfield, Bridgeport, and Arnold Turner, Danbury. The vote was overwhelmingly in favor of:

> All common carriers engaged in similar business being similarly taxed.
>
> Street railways being relieved of all paving requirements except the obligation to repair paving actually damaged by the companies.
>
> Street railways being relieved of all bridge building and maintenance requirements except the obligation to install and maintain the rails, wires and accessories used exclusively by the companies.
>
> Street railways having authority to operate motor buses in substitution for, or auxiliary to, existing lines, and to establish new bus lines, subject to jurisdiction of the Public Utilities Commission.
>
> Street railways having authority to abandon non-paying lines, or parts of lines, with permission of the Public Utilities Commission, after hearing.
>
> Municipal ownership only where it is impossible to induce private capital to operate a railway.
>
> Fares being determined by the relative cost of operating the street railway lines within a municipality or group of municipalities so interrelated as to riding habits as to make up a railway system essentially distinct from other systems in the state.

Forcible Arbitration Sought

Another Hearing at Albany on Appeal of Men to Require Strike to Be Arbitrated

Supreme Court Justice Howard at Troy, N. Y., on March 19 heard the application by Albany and Troy strikers for a peremptory writ to force arbitration of the dispute between the United Traction Company and its employees. Attorneys for the company fired eleven legal broadsides at the petition of the strikers. Chief among the legal objections raised by the company to the application which sought to invoke section 275 of the laws of 1920, the so-called "arbitration law," compelling arbitration of a dispute between two parties to a contract, were these:

> That the petitioners (the presidents of the two unions) are not employees of the United Traction Company.
>
> That the petition does not show that all the members of the Albany and Troy unions are employees of the company.
>
> That the statute law 275 does not authorize the petition nor authorize the petitioners to maintain the proceedings.
>
> That the arbitration clause in the contract between the company and its employes specifically mentions employees, and not members of the unions.

RAILWAY ATTORNEY EXPLAINS

Attorney Norton for the company in further explanation said:

> I want to call attention to section thirty-six, the arbitration section. Now this is not a general arbitration clause. It specifically sets forth that a month before the contract expires there shall be arbitration, which, if it is construed that the contract expires July 1 next, would mean it is too early for arbitration, or that if it expired Nov. 1 last, when the wage provision expired, it is too late for arbitration.
>
> Our final objection is that the petition on the face does not show the existence of any provision in a written contract to settle by arbitration a controversy between the petitioners or their alleged unincorporated associations and this respondent. I want to call the attention of your honor to the fact that the word "employees" is used and not the members of the said incorporated associations.

When the attorneys for the United Traction Company had finished their arguments the attorneys for the strikers were forced to ask that the argument of the petition be continued to give them time to answer. An arrangement was finally suggested by Justice Howard whereby the hearing will be continued on March 26. In the meantime both sides will file briefs.

For the benefit of the Mayors of the five cities in which the company operated Vice-president Weatherwax has reviewed the strike situation in a letter to them, indicating the extent to which the municipalities will be held liable by the railway for damage sustained to its property. Paragraphs from the letter touching specifically on these matters are as follows:

> We shall expect to be reimbursed for the destruction of our property, which has been substantial, and bills are in course of preparation and will be sent you in due course. It is unfortunate that the taxpayers must assume this burden. We cannot expect, however, to be reimbursed for the personal assults and damages to our employees. Human rights in this particular case seem to be subordinate to property rights.
>
> We believe that further and more effective measured should be taken to safeguard the rights of the public, our employees and our property, and hope that you can arrange to accomplish this at once.

Philadelphians Rejoice

Ten Years of Co-operation on P. R. T. Under Stotesbury-Mitten Management Celebrated by Banquet

E. T. Stotesbury and T. E. Mitten were tendered a testimonial banquet at the Hotel Lorraine on March 2 by the co-operative committees in celebration of the tenth anniversary of the successful operation of the co-operative plan on the lines of the Philadelphia Rapid Transit Company. Mr. Stotesbury was unable to be in attendance, due to his absence in Florida. The toastmaster was F. W. Johnson.

He said that only by looking back to March 2, 1910, was it possible to measure accurately the progress made since that time under the Stotesbury-Mitten management. John Lumbery, chairman of the employee committee of the transportation department, and other speakers from various branches of the service responded. They all reiterated the wonderful accomplishments under the present management.

THRIFT VALUE EXPLAINED

George W. Jackel, chairman of the general office department committee and president of the saving fund, told of the work done in inculcating thrift among the employees. Employees in the savings fund now number almost 8,000 members, with more than $1,000,000 well invested and money being deposited at the rate of more than $1,000,000 a year. This fund was started in 1919, when nearly everybody was spending madly and recklessly. In the face of this tendency of the times Mr. Mitten had pointed out to the employees the foolishness of such recklessness and had converted many employees into consistent savers.

George I. Zellers, another speaker, recited the difficulties overcome in winning the men to the Mitten plan after the ill will engendered previous to the coming of the Mitten management. He said that Mr. Mitten, however, had not only fulfilled his promises but had exceeded them. An engrossed volume containing the names of 10,214 employees of the company was presented to Mr. Mitten, and a similar volume was forwarded to Mr. Stotesbury.

Mr. Mitten was deeply moved. He said that the recent booklet showing the ten years of accomplishment under the Stotesbury-Mitten management, to which reference has been made before in the ELECTRIC RAILWAY JOURNAL, was put together at his suggestion for two reasons; first, so that the men might have before them a definite statement of the things that had been accomplished and in which they had had a part, and, second, because, knowing that Mr. Stotesbury had completed his term of work with the company, Mr. Mitten wanted to establish Mr. Stotesbury's work in the form of a monument to him.

He said that Mr. Stotesbury has already done for Philadelphia more than any other citizen could be asked or expected to do. He said that he was sending a telegram in testimonial to Mr. Stotesbury that he was sure "will sweep out of his mind clearly and cleanly all the difficulties that have occurred during his connection with us and leave only the wonderful feeling of accomplishment, so that he may consider that this ten years of work has been one of the greatest, if not the noblest, acts of his whole career. At least I am sure, and I am more certain of it than ever from that rising vote and that unanimity with which you arose, that we all together give him in saying farewell our respect and the love of the whole organization."

BUILDING FOR PERMANENCE

Mr. Mitten said that the call had come repeatedly from other cities to show them the way. During the last two years he had developed an organization which was self-perpetuating. The working out of the plan which the Mitten interests have in mind went beyond one man's lifetime. He then referred somewhat at length to the plan of organization of the Mitten Management, Inc., with Messrs. Tulley, Dunbar, Richardson, Joyce and P. J. Mitten as vice-presidents.

Mr. Mitten said that while he expected to die in harness he was nevertheless sure that the work would go on without him when his time came. It was in discussing this and other matters that Mr. Mitten made the reference to his son, Dr. Mitten, which has been quoted previously in the ELECTRIC RAILWAY JOURNAL.

In the testimonial to Mr. Mitten signed by the employees this hope was expressed:

"May your principles and practices serve as a perpetual well-spring of inspiration to others, and may their benefits and benign influences be extended to workers throughout all the land."

News Notes

New Agreement Will Call for Wage Cut.—It is reported that within the next two or three days the New York State Railways will offer the men in Rochester, Syracuse, Utica and Rome a new contract calling for a cut in wages from 60 to perhaps 45 cents per hour. The agreement between the company and the men expires on May 1 and under one of its provisions proposals for a new agreement must be submitted before April 1.

Bus Must Not Compete With Railways.—Permission to operate a bus line between Springfield and Peoria has been granted the Peöria-Springfield Motor Transit Company by the Illinois Public Utilities Commission. The company is allowed to have stations in seven towns, not including the terminals in Peoria and Springfield. The order of the commission prohibits the company from competing with any bus line now operating or with the electric railways in Peoria or Springfield.

"Ship by Trolley and Save the Highways."—The Indiana Service Corporation, Fort Wayne, Ind., has recently been doing some interesting advertising for the purpose of building up its freight business. This advertising has taken the form of "ads" three columns wide by 8 in. high. The only copy appearing in these advertisements has been this phrase: "Ship Your Freight By Trolley and Save the Highways."

Minnesota Measure Amended.—Eight amendments affecting the wording and intent of the substitute measure for the Brooks-Coleman bill providing for regulation of rates and securities issues of electric railway companies in Minnesota were adopted in the senate on March 10. A tenth amendment was rejected. Among the accepted amendments was one providing that only Minnesota corporations can receive indeterminate permits and franchises. Another designates the manner in which cities may acquire railway properties.

More Buses for San Francisco Municipal System. — A committee of citizens representing residents of the Twin Peaks district in San Francisco, Cal., have secured the approval of the Board of Supervisors for a bus line to serve this district and connect with municipal cars on the Market Street line. Two buses would be sufficient, according to the committee, to maintain the desirable service. The proposal is that the buses be put on as soon as the Market Street extension, a regrading project, is completed.

Municipal Men Still Seek Pay Increase.—Track and platform men of the San Francisco (Cal.) Municipal Railway have renewed their efforts before the Public Works Board to obtain a $1 a day increase in pay, which would mean a $6 a day wage. Failing to obtain the increase the men will appeal to the Board of Supervisors to meet the raise. The increase would effect more than 800 men. The Municipal Street Railway employees have been endeavoring for two years to obtain the $1 a day increase in pay.

Hearing on Utility Bills in Pennsylvania.—The various bills amending the Public Service Company law of Pennsylvania came up at public hearing on March 15 before the House judiciary general committee, and because only a fractional part of the representatives of the municipalities and public utilities had an opportunity to discuss the bills the hearing was continued after a two-hour discussion until March 22. The committee confined the remarks to the Fitzgibbon bill, giving the Public Service Commission discretionary powers to suspend increased rates until final action is taken by the commission and the McVicar bill, which requires that the utilities file data showing why increases are desired when making application for higher rates.

Financial and Corporate

New Cincinnati Directors

Indications Point to Early Consummation of Changes Suggested by Street Railway Director

Developments in the railway situation at Cincinnati, Ohio, during the past week included announcement of the appointment of two new directors of the Cincinnati Street Railway and the naming of a stockholders' committee among certain interests in Cincinnati Street Railway stock.

Charles W. Dupuis, president of the Citizens' National Bank, and Attorney Robert A. Taft, son of the former President of the United States, William Howard Taft, are the new members on the Cincinnati Street Railway board. Mr. Dupuis succeeds Stephen R. Burton and Mr. Taft succeeds Edward Goepper. It is understood that Mr. Taft represents the Taft and Mr. Dupuis the Kilgour interests on the board, adding thus to the influence of those two sets of interests in the directorate.

The personnel of the committee of stockholders includes Charles P. Taft, William Worthington, Edward Colston, Robert A. Taft, Edward W. Strong, Samuel Assur, Rufus B. Smith and Charles F. Windisch. Two of the members, Charles P. Taft and Robert A. Taft, are members of the directorate.

In connection with the announcement of the formation of the committee it was stated that the committee was appointed for the purpose of considering the problems arising out of the present situation. Just what relation it will have with the board or with the stockholders in general was not outlined. No intention to seek proxies or to represent other interests among the stockholders was indicated. The committee is considered to be strongly representative of the Taft interests.

The present situation continues to be the subject of daily conferences and consultation among the various interests. The conference committees of the Cincinnati Street Railway and the Ohio Traction Company held a meeting last week in an effort to reach an understanding as to the proposed reorganization of the two companies as demanded by William C. Culkins, Street Railway Director. At the conclusion of the meeting announcement was made that more time was needed to discuss the different phases and that a report of the committee's decision would be made when an agreement was reached. In the financial district it is believed that a practical plan for financing the system will be devised and submitted to the directorate and stockholders as a result of the conferences.

Mr. Culkins said that while he was not aware of the purpose for which the stockholders' committee had been formed he considered it to be in line with his recent request that steps be taken by the Union Traction Company, the Cincinnati Street Railway and the Ohio Traction Company to reorganize into an operating company.

The object of the reorganization, as proposed by Mr. Culkins, was to bring about a reduction of fares. He called upon the three companies to reduce their capitalization, settle certain demands which are said to be outstanding against the companies to the extent of $300,000 or $400,000, and to surrender the franchises under which they are now operating.

Another conference of the committees has been called for March 28.

Bids for Railway Sale Authorized

Justice George W. Cole in the Supreme Court of Erie County has issued an order authorizing William B. Cutter, as receiver, to advertise for bids for the sale of the property of the Buffalo & Depew Railway, Buffalo. The bids will be for all or any part of the equipment of the interurban line between the Buffalo city line and the village of Lancaster. It includes machinery, rails, ties, bridge, carhouses, power house and all other property real and personal including franchises. Bids may be made upon the understanding that the successful bidder shall have the right to operate or junk the property.

A partial list of the property shows 1,315 gross tons of steel rails; 121 gross tons of miscellaneous iron; 2,894 lb. of copper bands and ears; 12 miles of 00 trolley wire weighing about 25,464 lb.; approximately 12 miles of 350,000 CM feed wire weighing about 67,668 lb.; feeder taps and cross bonds weighing about 1,000 lb.; 27,000 railway ties; 90,000 ft. of bridge timber; four two-motor passenger cars; one four-motor work car and plow; one three-motor sweeper; and office furniture and fixtures.

Subway Alone Earned Charges

According to a statistical statement recently issued by the New York Public Service Commission, First District, all the railways in the Borough of Manhattan except the Subway Division of the Interborough Rapid Transit Company failed to earn fixed charges for the six months ended Dec. 30, 1920.

Two of the three companies divorced from the New York Railways combine failed even to meet operating expenses, while the third—the traction lines of the New York & Harlem Railroad—failed to meet its fixed charges.

The Third Avenue Railroad, including its subsidiary Westchester lines, earned its fixed charges except for full interest on its adjustment income bonds. A statistical study follows:

INCOME ACCOUNT — TRANSPORTATION SYSTEMS IN MANHATTAN AND THE BRONX

Six Months Ending Dec. 30, 1920

	——Interborough Rapid Transit Co.——								
	Total	Subway Division	Manhattan Elevated Division	New York Railways	Eighth Avenue Railroad	Ninth Avenue Railroad	Second Avenue Railroad	New York & Harlem Traction Line	Third Avenue Railroad (d)
Passenger revenue	(c)	(c)	(c)	$4,287,384	$561,607	$247,779	$476,136	$808,810	$6,565,646
Other revenue	(c)	(c)	(c)	512,053	10,625	5,000	28,208	13,153	176,313
Total operating revenue	$26,969,396	$16,806,448	$10,162,947	$4,799,437	$572,232	$252,779	$504,344	$821,963	$6,741,959
Operating expenses	18,034,299	10,764,966	7,269,333	4,613,994	619,317	300,941	479,498	764,004	5,464,491
Operating revenue	$8,935,097	$6,041,482	$2,893,614	$185,443	$*36,985*	$*48,162*	$24,846	$57,959	$1,277,468
Taxes	1,311,268	210,679	1,100,588	393,653	45,117	27,031	45,985	30,000	316,291
Operating income	$7,623,829	$5,830,803	$1,793,026	$*208,210*	$*92,202*	$*75,193*	$*21,139*	$27,959	$961,177
Miscellaneous income	316,253	(b) 290,790	25,463	293,155	17,415	1,875	922	257	....
Gross income	$7,940,082	$6,121,593	$1,818,469	$84,945	$*74,787*	$*73,318*	$*20,217*	$28,216	961,177
Fixed charges	10,622,342	5,939,602	4,683,239	1,402,725	37,706	3,904	94,835	108,550	771,721
Net income	$*2,682,260*	$181,989	$*2,864,770*	$*1,317,780*	$*112,493*	$*76,222*	$*115,052*	$*80,334* (a)	$189,473
Revenue passengers	496,595,522	308,285,537	188,309,985	83,298,107	11,232,143	4,973,305	9,852,902	16,176,205	133,883,595
Revenue transfer passengers	....	....	....	6,453,797	....	....	....	....	....
Free transfer passengers	....	....	....	2,034,057	....	11,939	251,553	1,638,856	27,529,721
Total	496,595,522	308,285,537	188,309,985	91,785,961	11,232,143	4,985,244	10,104,455	17,815,061	161,413,340
Miles of track	348.62	223.48	125.14	(c)	(c)	(c)	(c)	(c)	(c)
Active passenger car-miles	85,922,894	50,986,431	34,936,463	6,953,625	1,366,785	802,871	919,287	1,609,980	11,283,069
Passenger car-hours	(c)	(c)	(c)	1,047,519	189,820	104,941	132,663	213,321	1,440,189
Car-seat-miles — active	(c)	(c)	(c)	296,986,222	43,737,088	28,903,356	42,044,627	66,742,190	514,114,700

Note.—Figures in italics indicate deficit.

(a) Applicable to adjustment bonds — with interest charges of $563,399.

(b) Includes other operations (c) Details not available.

(d) Financial figures include and traffic figures exclude Westchester companies operating no cars in New York City.

$58,100 Deficit in Toledo

Showing for First Month Under Service at Cost Regarded as Far From Disappointing

Operations for the month of February, 1921, of the Community Traction Company, Toledo, Ohio, showed a deficit of $58,176, according to Commissioner Wilfred E. Cann, in his first monthly report to the Board of Control. In commenting on the report, Mr. Cann said:

> In view of the fact that a relatively low rate of fare, as compared with last year, became effective on Feb. 1; that industrial conditions in the city are in a stagnant condition; that we have not as yet had time to put into effect economies which may result in the rerouting of cars, I think you will agree that the showing made is far from disappointing, and I can safely assure you that despite the decrease in revenue for the first seven days of March over the first seven days of February this month's report will show a greatly improved condition.

The table gives details of operation for February, 1921.

The Community Traction Company has rented for office space the entire fourth floor of the Toledo Railways & Light Company building for $1,650 per month. The tax reserve set up for February is practically double what it would be ordinarily, due to the company being compelled by ordinance to have its fiscal year agree with the calendar year. The monthly tax reserve will approximate $7,750 hereafter.

The monthly credit to the depreciation fund has been fixed at the minimum allowed by the ordinance; namely, 0.5 per cent of the capital value. This amounted to $3,541 for the month. An allowance of 8 cents per revenue car mile is being made temporarily to the maintenance and repair fund. Undoubtedly this is insufficient to cover the necessary work for during the month of February the work undertaken cost $360 more than the allowance.

The city has through the operation of the sinking fund gained an equity in the company for the month's operation equivalent to $17,708. The interest on bonds and dividends on preferred stock was paid to a trustee to be held for the city until the company lifts the mortgage on the railway property.

The Toledo Railways & Light Company asked for a rate of 2.35 cents a kilowatt for power under a 25-year contract, compared to a rate of 2.28 cents per kilowatt as was formerly charged off to the railway department by the old Rail-Light company. Commissioner Cann states that the ordinance provides that the rate for power shall be a "reasonable charge based upon cost of generating power in a modern power plant," and that he has submitted the contract to Professor H. E. Riggs, University of Michigan, for comment.

STATEMENT OF INCOME, ACCRUAL AND OPERATING EXPENSES OF THE COMMUNITY TRACTION COMPANY, TOLEDO, OHIO

	Feb. 1920	Per Cent of Gross Revenue	Per Car Mile (Cents)
Passenger revenue	$270,551	95.78	......
Special car operation	16	.....	......
Revenue from transportation	$270,567	95.78	46.47
Station and car privileges	1,543	.55	......
Rent of tracks and terminals	9,632	3.42	......
Rent of equipment	694	25	......
Miscellaneous	50	...	......
Non-transportation revenue	$11,919	4.22	......
Gross revenue	$282,486	100.00	46.50
Cost of operation:			
Way and structures	21,754	7.69	3.575
Equipment	23,137	8.17	3.800
Overhead system	4,102	1.45	.674
Transportation	132,887	47.00	21.820
Traffic	6	.....	......
Power	57,447	20.38	9.440
General and miscellaneous	20,494	7.25	3.368
Expense of Street Railway Commissioner's office	742	.26	.122
Operating expenses	$260,569	92.20	42.86
Gross income	$21,917	7.80	3.64
Depreciation fund (*a*)	$3,542	......	......
Maintenance and repair fund (*b*)	360	......	......
Sinking fund	17,708	......	......
Taxes (*e*)	15,150	......	......
Interest on bonds (*c*)	40,000	......	......
Dividend on preferred stock (*d*)	3,333	......	......
Total deductions	$80,093	......	13.15
Net income from all sources	$58,176	......	9.51
Stabilizing fund balance Mar. 1 1921	$341,824		......
		Per Cent of Total	Per Car Mile
Revenue Passengers:			
Full fares at 6 cents	4,241,928	77.60	6.97
Children's fares at 1 cent	298,171	5.46	.49
Total revenue passengers	4,540,099	......	......
Transfers at 1 cent	851,344	15.60	1.40
Employees	75,849	1.39	.12
Total riders	5,467,292	100.00	8.98
Revenue per fare passenger (cents)	5.77	......	......
Revenue per revenue ride (cents)	5.02	......	......
Revenue per ride (cents)	4.95	......	......
Cost of operation per revenue ride (cents)	4.83	......	......
Cost of operation per ride (cents)	4.77	......	......
Revenue car miles	607,909	......	......

(*a*) Based on 0.5 per cent of capital value of $10,000,000.
(*b*) An allowance of 8 cents per revenue car mile credited to this fund. This figure represents over draft in fund
(*c*) $8,000,000 — 6% 1st Mortgage bonds outstanding.
(*d*) Preferred stock outstanding is $2,000,000 on 8 per cent basis.
(*e*) Two months charges due to ordinance requirements.

Results Better in Kansas City

Improved Efficiency With Reduced Personnel Contribute to Improvement There

Several items in the statistics of the Kansas City (Mo.) Railways indicate steady and marked progress during the past year and under the receivership, which has been in operation since September. During January, 1921, 15,431,572 passengers were carried, against 13,763,136 in January, 1920, including transfers, employees, and persons riding on passes. The figures for fares are for 1921, 10,425,502; and for 1920, 9,840,391.

The passenger revenue was $783,606 in January, 1921, against $725,021.10 in January, 1920. Costs have declined as receipts increased, despite the fact that larger amounts have been expended on maintenance and improvements. In January, 1920, for instance, $23,892 was spent on ways and structures, and $42,146 on this department in January, 1921. In January, 1920, power costs were $241,827 and in January, 1921, $210,155 although more cars were operated and more passengers carried.

FEWER EMPLOYEES

The reduced operating costs are reflected in the fact that in January, 1920, there were 3,900 employees, and in January, 1921, only 3,500 employees. In June, 1920, a voluntary wage increase was granted, amounting to about $500,000 a year on the basis of the number of employees then serving. Still labor costs in January, 1921, were $453,911, as against $466,000 in January, 1920. The increase in wages has therefore more than been offset in improved efficiency, permitting reduced personnel and less overtime.

One of the most interesting subjects of comparison is that of accidents and claims settled. There was an average of thirty-one accidents a day in January, 1920; and an average of twenty-two a day in January, 1921. The total number of accidents in January, 1920, was 957; while the total this year was 712.

The receivers have been setting aside $60,000 a month for claims; they have been settling every case immediately upon its arising, when possible—settling many more cases than the company had previously been able to dispose of proportionately to claims, and have accumulated a sum more than ample to meet the maximum demands, it is said, of pending liabilities.

Portland Notes Quickly Sold to Local Investors

Employees, customers and other individual investors not only absorbed the entire offering of $1,000,000 of 8 per cent five-year gold notes of the Portland Railway, Light & Power Company, Portland, Ore., in twelve days, but also piled up an over-subscription in the same period. The achievement is believed to be a record for the sale of local securities in the Portland district.

The average daily sales during the campaign aggregated over $90,000 and the total number of persons who purchased the gold notes is approximately 3,200.

The loyalty to and confidence in the company were displayed by the employees, nearly 70 per cent of whom bought a total of almost $400,000 of the notes.

Of the entire offering 90 per cent was disposed of in the immediate Portland district, the balance being scattered over the thirty odd communities receiving light, power and transportation service from the company.

One of the gratifying features of the campaign was the fact that nearly 70 per cent of the total sales were cash subscriptions and the wide distribution of the sales is shown by the fact that the largest individual order was for $7,500.

Results in Spokane Still Unsatisfactory

While the Washington Water Power Company's railway lines in Spokane were making a net profit of $78,970 during 1920 with the 6-cent fare, the traction lines of the Spokane & Eastern Railway & Power Company were losing a total of $144,029, according to the monthly reports submitted to the commissioner of public utilities.

The Washington Water Power Company was able also to set aside $174,600 from the year's receipts for depreciation. The Traction lines, operating at a loss, subtracted $14,649 for depreciation of property during the year.

Both companies are applying for an 8-cent fare.

The Water Power lines carried 20,500,075 passengers during 1920, while the Traction lines carried 9,274,743 passengers. The Water Power company made a profit of about one-third of a cent on each passenger. The Traction lines lost about one and one-third of a cent a passenger.

Heads of the two companies declare with equal emphasis that the 6-cent fare, in effect since April, 1919, has not solved their financial troubles.

Municipal Operation at Ten-Cent Fare Successful

The city officials of Ocean City, N. J., will apply to Chancellor Walker for the appointment of a trustee or receiver to operate the Ocean City Electric Railway during the coming summer season. The road has been operated during the past two seasons by a trustee appointed by the court. This was brought about by the company refusing to operate, after which the municipality petitioned the Board of Public Utility Commissioners to compel it to do so. The court then appointed a trustee and the municipality agreed to guarantee the cost of operation.

In the beginning the municipality guaranteed the cost of operation and maintenance only, any revenue over and above that amount to go to the bondholders. The first season there was very little left to divide among the security holders. The railway was finally allowed to increase the fare to 10 cents in each zone and last season the corporation earned and paid 6 per cent on the bonds, over and above operating expenses.

The permanent and summer residents of Ocean City agreed to the 10-cent fare in order that the road be kept in operation. The railway is the only one in New Jersey being operated by a municipality.

Financial News Notes

Will Abandon Belt Line.—The Public Service Commission has granted permission to the Belt Line Railway Corporation to discontinue service on its line on Tenth Avenue between Forty-second Street and Battery Place, New York. Business on the line has been steadily decreasing. The rails are to be removed by the company and the street repaved.

Dividend on Arrears Declared.—The directors of West Penn Traction & Water Power Company Pittsburgh, Pa., have declared the usual quarterly dividend of 1½ per cent on the preferred stock, payable May 16, 1921, to stockholders of record May 2. The board also declared a dividend of 1½ per cent on account of dividends in arrears accumulated upon its preferred stock prior to 1917, such dividend to be payable May 16 to stockholders of record May 2, 1921.

Brooklyn Receiver Would Resume Operation. — Lindley M. Garrison, receiver of the Brooklyn (N.Y.) Rapid Transit Company, has asked the Public Service Commission for permission to resume operation of the Park Slope line. Mr. Garrison intends, he says, to operate from Borough Hall to Park Circle during the morning and evening rush hours only. There will be no operation of the line on Sundays or holidays. The Public Service Commission has reserved decision.

Board of American Railways Increased.—At the annual meeting of the American Railways, Philadelphia, Pa., on March 17 the board of directors was increased from nine to twelve members. The new members are Charles F. Conn, James E. Gorman and Charles L. S. Tingley. The other members of the board are: Van Horn Ely, Lewis L. Dunham, John Gribbel, John J. Henderson, W. H. Lippincott, E. Clarence Miller, Charles R. Miller, Alexander C. Robinson and Thomas W. Wilson.

Valuation Being Made at Lynchburg.—The Lynchburg Traction & Light Company, Lynchburg, Va., recently made a valuation of its combined properties to be used as the basis of rate application. In order to confirm these figures the company is now having an independent valuation made by A. L. Drum & Company, Chicago. As soon as this work has been completed and the report submitted, the company expects to file its formal rate appeal, basing the increase asked on the need shown by each separate department of the service as disclosed by the appraisal.

Messrs. Stotesbury and Shelmerdine Out of P. R. T.—G. A. Richardson, vice-president of the Philadelphia (Pa.) Rapid Transit Company in charge of transportation, and Charles J. Matthews, president of C. J. Matthews & Company, leather manufacturers, Philadelphia, have been elected to the directorate to replace E. T. Stotesbury and W. H. Shelmerdine. The other directors re-elected by the Philadelphia Rapid Transit Company are Thomas E. Mitten, W. J. Montgomery, W. Y. Tripple, Frank Buck, W. C. Dunbar, and Jeremiah J. Sullivan.

City Restrained in Valuation Case.—Federal Judge C. W. Sessions at Memphis, Tenn., has granted an injunction restraining the city from collecting on more than 75 per cent of the total assessment against the Memphis Street Railway and other utilities. He held that the property of the utilities had been assessed on a 100 per cent valuation, while the appraisal of other real estate property was on a much lower basis. The complainants had already paid their taxes on a 70 per cent assessment basis. The new order by Judge Sessions means that they must now pay an additional 5 per cent. The Memphis Street Railway contended that it was operating on a service-at-cost basis, and that during the last six months the loss was $110,000. The opinion handed down by the court said that if the receivers were compelled to pay the disputed tax, which amounts to $71,250 the company would have to raise the rate of fare from 6 cents to 7 cents.

Another Bondholders' Committee in Brooklyn.—A protective committee of three has been formed by holders of Brooklyn, Bath & West End Railroad general mortgage 5s, dated Oct. 1, 1933, following a report of the Bank of America, trustee, on the application of the receiver of the Nassau Electric Railroad, Brooklyn, N. Y., to discontinue operation of the lines of the West End Company. The Brooklyn, Bath & West End is a predecessor company of the Nassau Electric Railroad. There are outstanding $121,000 of the general mortgage bonds which constitute a prior lien on property of the Nassau Electric Railroad. Retirement of the issue at maturity is provided for in the indenture securing the outstanding Nassau Electric first consolidated 4s, but since the institution of foreclosure proceedings on the Nassau mortgage, and the proposal of the receiver to discontinue operation on the West End line tracks, the formation of the committee was thought advisable by the trustee in order that the bondholders might be in a position to take concerted action as occasion might arise.

Traffic and Transportation

Louisville Appeal Heard

City Advances Contract Claim in Fare Controversy—Railway Contends City's Rights Are Regulatory

The appeal of the city of Louisville was heard by the United States Court of Appeals at Cincinnati, Ohio, on March 18 and 19. The case was carried to that court from the decision of Judge Walter Evans of the United States District Court of Louisville in connection with the injunction granted the Louisville Railway preventing the city of Louisville from interfering in the collection of a 7-cent fare. After hearing the appeal the court at Louisville adjourned until April 5.

The Court of Appeals did, however, order that in the interim the Louisville Railway issue receipts in the form of a stub on each strip of five tickets sold for 35 cents, this receipt to be held by passengers as a possible rebate voucher in the event the decision goes against the company. The company contended that to issue cash receipts with every fare collected would require a great deal of additional work and be very costly, but it indicated a willingness to co-operate by attaching rebate stubs to tickets.

The court further ordered that the company should give bond of $200,000 to secure receipt holders. In the event the company loses the suit the federal court will appoint a commissioner to supervise settling the receipt matters. The railway has ten days under the court order in which to arrange for issuing receipts, but the company reported that it would have receipts out within two or three days.

Six-Cent Fare Paid Voluntarily

The spectacle of car riders voluntarily paying a higher rate of fare than is called for in a franchise possessed by their city is being witnessed in Lakewood, Ohio, a suburb of Cleveland with a population of 41,000.

Lakewood has a franchise with the Cleveland Railway calling for a straight 5-cent fare or eleven tickets for 50 cents. This franchise is still in effect, but recently, under the service-at-cost franchise in Cleveland, it became necessary for the company to charge a 6-cent fare within the limits of Cleveland. Then for a month or more, Lakewood car riders enjoyed a longer haul for 5 cents than Cleveland riders were getting for 6 cents.

City officials of Lakewood said they would not stand for boosting the fare for Lakewood riders to that being paid by Cleveland riders, but the company announced a 6-cent fare for Lakewood riders, effective on Feb. 27, and since that time more than 95 per cent of Lakewood riders have been voluntarily paying the higher rate of fare. Officials of the suburb still say they will not formally sanction the increase and Fielder Sanders, City Street Railway Commissioner, admits that the company has no legal way of enforcing a rate of fare higher than a nickel.

Commodious Quarters for Bus Patrons

The city of Tacoma, Wash., will soon have one of the most convenient union bus stations on the Pacific coast. With this end in view the work of remodeling the building at Pacific Avenue and Eighth Street is now being completed. Motor buses for Olympia, Seattle, Puyallup, Sumner and other towns will load and unload their passengers there from an inside platform connecting with the ticket offices. Commodious waiting rooms will face the ticket offices. A restaurant and small shops will be located in the building. The bus station will be open to any bus company which wants to operate from it. The motorbus business in Tacoma has developed so rapidly during the last year that the move to make a union bus station in a central location became necessary.

State Seeks Control Over Interurban Fares

Recent advances in interurban fares in Texas have resulted in the State Attorney General being asked for an opinion as to the authority of the Railroad Commission over interurban lines. That official held that under the present state laws, the commission has no authority whatever over such fares. A bill has since been introduced in the House to give the Railroad Commission authority to regulate interurban fares.

Before this bill was introduced the commission called on the interurban companies for data and reasons for advances. Among the replies received was one from G. H. Clifford, vice-president and general manager of the Northern Texas Traction Company, Fort Worth. He stated the case for the interurbans succinctly. In concluding his remarks Mr. Clifford said that the situation affecting the interurbans was very different from that which existed some months ago. Service had to be provided now at greatly added operating costs. Moreover, there was no prospect of an early decrease in operating expenses. Traffic had decreased as a result of the abandonment of army cantonments, lessened activity in the oil industry and the general depression in business. He said that an analysis would show that even at the increased rates now in effect his company was not being compensated for service rendered.

One-Man Car Precautions

Massachusetts Commission Restricts One-Man Car Operation at Railroad Grade Crossings

The Massachusetts Department of Public Utilities has issued a drastic order governing the operation of one-man cars over steam railroad grade crossings. It is of especial interest to Massachusetts companies at this time, as the State Legislature has before it a bill sponsored by the labor interests to prohibit the operation of any one-man cars in the State because of the alleged danger to the public.

The grade crossing order of the Department of Public Utilities prohibits the operation of one-man cars across railroad grade crossings except where the crossing is protected by train crews, gateman or flagman, unless special authority is granted by the department. A safety stop is required at a distance of 75 to 125 ft. from the crossing, and another at a point just clear of the crossing. Installation of trolley guards is made compulsory.

The complete text of the order follows:

1. Unless authorized by the department, street railway cars operated by, or in charge of, one man shall not be operated over a railroad crossing at grade unless all engine and train movements over such crossings are required by the rules of the railroad, or by an order of the department, to be protected by train crews, or unless at the time the street railway car is operated over it such crossing is required by the rules of the railroad, or by an order of the Department, to be protected by a gateman or flagman.

2. Upon approaching a railroad crossing at grade the operator of a street railway car, operated by one man, shall bring it to a stop at not less than 75 and not more than 125 ft. from the crossing, for the purpose of making sure that the car is under control; then slowly advance the car to a point clear of the railroad track, where he shall again stop the car and ascertain if the way is clear before crossing; provided, however, that the second stop shall not be required at crossings of spur tracks where the rules of the railroad, or an order of the department, require all engine and train movements to be protected by train crews.

3. At all crossings with railroads at grade, except crossings where all engine and train movements are required by the rules of the railroad, or by an order of the Department, to be protected by train crews, there shall be maintained a trolley guard over the trolley wire constructed in such manner as to be connected with the power circuit, so that, in the event of the trolley wheel leaving the wire and being caught by the guard, power will be supplied to the car motors.

4. The foregoing rules shall not be considered as relieving street railway companies from maintaining special crossing protection required by specific orders issued by the department under the provisions of section 58 of chapter 159 of the General Laws.

5. The foregoing rules, with the exception of rule 3, shall be effective from and after April 1, 1921, and rule 3 from and after July 1, 1921.

Jitneys Ruled Off Railway Streets

The City Council of Kansas City, Mo., passed an ordinance on March 21 prohibiting the operation of jitneys on streets where electric railways now operate. The Mayor signed the order on March 22. A fund is being raised by the Jitney Owners' Association to contest the ordinance. The jitneys now operate over routes designated by the City Jitney Inspector. New routes must now be assigned away from car lines.

Eight Cents Asked in Spokane

A public hearing on the request for an increase in fares on the lines of the Washington Water Power Company and the Spokane Traction Company will be held in Spokane, Wash., by the State Public Service Commission the latter part of March or early in April. An 8-cent fare is sought. The present fare is 6 cents.

The Washington Water Power Company, in paving the way for the hearing, is using full page newspaper advertisements to tell the public the reasons underlying the request for increased fares. The initial advertisement was concluded as follows:

> The history of the street railways in Spokane is an open book. Not a shadow of suspicion has ever been cast upon the granting of the franchises. Not a hint has ever been heard of sharp practice in the organization of our company. Not a dollar of watered securities figures in our capitalization. Not a cent has been filched from any one under the guise of reorganization, or otherwise. Not a word of doubt has ever been uttered as to the integrity of public officials in relation to the street railways. Differences of opinion, it is true, have been expressed heretofore as to the justice or wisdom of certain requests. Such differences of opinion as may arise in the settling of the question at issue can be approached without rancor—on a plain, square business basis—free from animosity, and with the public taken into confidence as to every detail.
>
> It is with this spirit that we shall endeavor to show you as a citizen and property owner—whether you ride upon the street cars daily or very seldom—that an increased fare is not only just, but necessary. And in support of our contention we shall present to you, in simple form, a statement of our operating expenses and our income. We shall show what becomes of the fare that you pay us. We shall show you what other northwestern cities have done. We shall show you, in a word, how your own interests will be best advanced by the establishment of an 8-cent fare in the city of Spokane.

Ithacans to Pay Eight Cents

The Ithaca (N. Y.) Traction Corporation has been granted permission to increase its fares in all municipalities in which it operates from 7 cents to 8 cents. Some time ago the company applied to the Public Service Commission for authority to charge 10 cents, submitting statements to prove that the 7-cent fare was insufficient to yield reasonable compensation for the service rendered. There was a good deal of opposition to the advance in fares. Commissioner Irvine in announcing the decision stated that a 10-cent fare was not necessarily the solution to the traction problem, and that only what was imperatively required would be granted the company. In making a decision Mr. Irvine said that the patrons' welfare had to be considered. The recent ruling gives the company permission to charge an 8-cent fare on all lines in Ithaca, Cayuga Heights and the town of Ithaca with the exception of the East Ithaca line.

Courtesy Promotes New Business

Every official of the railroad department of the Monongahela Valley Traction Company, as well as heads of other departments of the same big local concern were present at a dinner given recently in the Y. M. C. A., Fairmont, for the purpose of complimenting the officers and the men in the various departments for the splendid manner in which they handled the crowds occasioned by the recent Billy Sunday tabernacle meetings in Fairmont, W. Va. Captain Alexander, president of the company, expressed the belief that the Sunday meetings would not have proved the success they were had not the traction company been able to bring from a distance the 33,000 people it handled to and from the tabernacle. Mr. Alexander spoke further of the future of the railway, the creation of new business and courtesy as the cheapest means of acquiring new patronage.

"Courtesy," said the captain, "is the cheapest service that our motormen and conductors can offer the public. It is just as easy to give it as to refuse it. I ask you officials to impress upon the men under you the absolute necessity of extending courtesy on all occasions."

Through Indianapolis-Louisville Service Celebrated

The Interstate Public Service Company, operating between Indianapolis and Louisville, will put into service soon its new limited trains between the two cities. Harry Reid, president of the company, announces that seven trains each way will be operated when the new schedule is completed.

Seventy business men of Indianapolis and the cities along the interstate lines went to Louisville recently to return the call made a week before by representatives of civic and commercial bodies of Louisville and other cities along the route. The Hoosiers made the trip in one of the Interstate's new steel trains as the guests of Mr. Reid, L. M. Brown, superintendent; Bert Weedon, passenger and freight agent, and Ira Guthrie, auditor. The tourists returned to Indianapolis in the afternoon.

Charles S. Henry, who, in 1898, brought the first electric interurban car into Indianapolis over the Indiana Union lines and now operating head of the Indianapolis & Cincinnati Traction Company, was an interested observer of the operation of the new interstate trains. On both the outbound and return trips, Mr. Henry, with watch in hand, timed the train and frequently announced the time in excess of 60 m.p.h.

Bus Legislation Before Council

Jitney regulating legislation lies slumbering in the Council at Toledo. The jitneys have slashed their fares from 6 to 5 cents as an answer to the educational campaign of the railway to discourage riding in jitneys at the peril of higher fares on street cars under the service-at-cost plan.

The ordinance, which has been prepared by a special subcommittee of Council to regulate the buses, provides for a license fee of from $150 to $300 and an indemnity bond ranging from $15,000 to $30,000, depending upon the size and capacity of the bus.

Utah Ranks Second in Electric Mileage per Capita

With three electric railroads extending from Preston, Idaho, to Payson, Utah, 70 per cent of the population of the State of Utah lives in the territory through which the Utah portion of this unbroken line of electric railroads passes. Recent figures compiled under the direction of Ross Beason, traffic manager of the Salt Lake & Utah Railroad, which runs from Salt Lake City to Payson, Utah, show this fact. It is also shown that Utah is the second state in the Union from the standpoint of mileage of electric lines per capita. California ranks first, with 11.4 miles of track for each 10,000 persons. Utah has 10.1 miles of track for every 10,000 inhabitants.

During 1920 the Salt Lake & Utah Railroad carried about 900,000 passengers, or an average of more than 2,500 passengers a day for a distance of 18 miles. On this basis the average daily passenger train mileage is equal to the distance from Omaha to Chicago, and the passenger train mileage of all the electric lines in Utah will average a daily mileage equal to the distance from New York to San Francisco, according to Mr. Beason.

LARGE INCREASE IN FREIGHT TRAFFIC

From a few hundred cars of freight handled during the first year's operation of the Salt Lake & Utah, in 1914 and 1915, that road has increased its freight traffic until last year it handled 9,036 cars. This does not include 22,000,000 lb. of less than carload shipments carried between merchants of Salt Lake, Provo and other points on the line. During the first year's operation the less than carload shipments totaled 10,000,000 lb., representing an increase of more than 50 per cent in this line.

With a monthly payroll of practically $34,000, this road now operates over a total of 92½ miles of track, 67 miles of which is main line, 9 miles of branch line and the balance in spurs and sidetracks.

BUSINESS HAS THRIVED

Over this trackage is operated daily about 130 steel, coal and freight cars, drawn by six electric locomotives, exclusive of the passenger cars, all of which is owned by the road. On this property, lying all within the State of Utah, taxes to the amount of $50,000 are paid yearly. The property is owned and controlled by local citizens and interests.

During the brief period of its existence there have been sixty-one industries and manufacturing enterprises organized and now being operated in the territory through which this road passes. Among the plants that have come into existence have been four sugar factories, six canning factories, several lumber and coal yards and a number of wholesale and jobbing houses.

Transportation News Notes

Up-State Railway Wants Fare Rise.—The Elmira, Corning & Waverly Railway operating an interurban line connecting Elmira, Waverly and Corning, N. Y., recently petitioned the Public Service Commission for permission to increase its one-way fares 33⅓ per cent. In addition the company wants to discontinue all round-trip fares and cancel transfer privileges as now existing.

Increased Rates Refused. — The Pennsylvania Public Service Commission has denied the application of the Johnstown (Pa.) Traction Company to increase its fares from 7 cents to 8 cents with a ticket fare increase from four for 25 cents to four for 30 cents. In accordance with the new ruling the company will continue to charge a 7-cent fare, but it will have the privilege of selling four tickets for 28 cents or five for 35 cents instead of the present four for a quarter.

Fare Boxes in San Diego.—All cars of the San Diego Electric Railway have been equipped with fare boxes for the collection of fares, effective March 10. Previously the fares were paid directly to the conductor by the passenger. The new rules require the passenger to deposit the fare in box. At the same time metal tokens replaced the printed tickets for full fares through outer and inner zones. The metal tokens sell for the same price as did the tickets, four for 30 cents. The changes are expected, company officials state, to improve the service and speed up schedules.

Intrastate Tariff Filed. — Traction companies operating in Indiana filed a petition with the Public Service Commission on March 11 for a new schedule of through intrastate interurban fares. Officials connected with companies filing the petition stated that it is for the purpose of adjusting through tariffs to the present rate. It will result in an increase in rates over some of the existing through tariffs, according to officials. In all cases the lowest local fares have been used, however, in computing the through rate.

Increased Rates Suspended.—The Interstate Commerce Commission has recently ruled that the proposed new rates on the Washington-Virginia Railway, Washington, D. C., which were to have been effective on Feb. 13 be suspended for four months. Last April the price of twenty-trip tickets good for a period of two weeks was increased from $2.70 to $4. The road now seeks to increase the price of the round-trip from 38 to 48 cents and to increase the price of the monthly or fifty-two-trip book of tickets from $4.46 to $5.50.

Wants Higher Rates in Lynchburg.—The Lynchburg Traction & Light Company, Lynchburg, Va., will apply to the State Corporation Commission for increased railway rates as soon as the valuation of the property has been completed. J. N. Hancock, general manager, states that the company operating so long on pre-war rates has found it imperative to seek relief. In addition, he says that the company has been compelled to borrow money for certain improvements and now faces the necessity of raising still further sums.

Will Resume Line With Extra Fare.—Public Service Commissioner Barrett has granted permission to Lindley M. Garrison, receiver of the Brooklyn, Queens County & Suburban Railroad to resume operation on the Metropolitan Avenue surface line to Jamaica Avenue with an extra 5-cent charge between Jamaica Avenue and the Metropolitan Avenue station of the Myrtle Avenue elevated. The receiver's application for resumption of this line was referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 12.

Increased Passenger Rates Sought.—The Indianapolis & Louisville Traction Railway, the Interstate Public Service Company, the Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Lighting Company, operating lines in southern Indiana, filed petitions on Feb. 28 in the offices of the Public Service Commission asking for an increase of passenger rates from 2¾ cents a mile to 3 cents a mile. The petitioners say in each case "that with the exception of your petitioner and affiliated companies all interurban electric lines within the State of Indiana are receiving not less than 3 cents a mile as their established passenger fare rates."

Temporary Fares Continued Until 1922. — The British Columbia Electric Railway, Vancouver, B. C., has opened negotiations for new franchises with the cities of Vancouver, North Vancouver and New Westminister and the Municipalities of Point Grey, South Vancouver and North Vancouver district. A temporary agreement permitting the present fares to be charged until June 30, 1922, has been signed and the company has withdrawn its application for a Dominion charter which would have taken the control of the company out of local or provincial authorities. Under the temporary agreement, new franchises must be signed before August 31, 1921, otherwise the company will be at liberty to renew its application for a Dominion charter. The company is at present charging 6 cents on its city lines with a 7-cent commutation rate to suburban zones.

Fare Decrease Protested in Washington.—The Capital Traction Company Washington, D. C., has filed with the Public Utilities Commission a petition to prevent the rate of fare on that system from automatically going back to 5 cents with a 2-cent charge for transfers on April 1. George E. Hamilton, president, does not say definitely in the petition what rate of fare his company needs. He emphasizes two points: (1)That the Capital Traction Company could not operate under present conditions with a 5-cent fare and 2-cent charge for transfers, (2) that it would be unwise to establish separate rates of fare for the two companies if investigation shows that the Capital Traction could get along with a rate lower than the Washington Railway & Electric Company requires.

Application for Increased Rate Denied.—The Public Service Commission for the Second District of New York has denied the application of the Empire State Railroad to charge 10 cents in Oswego. In October, 1919, the company was permitted to advance its passenger rates from 5 cents to 7 cents. In that same order of the commission the company was allowed to operate one-man cars. It was not until September, 1920, eleven months after the authorization by the commission that the new schedule went into effect. This delay was occasioned by a controversy over the operation of the one-man cars without which cars the company did not care to put into effect the new schedule, and further on account of the destruction of some of its equipment by fire. Two months after the new rates went into effect the company applied to the commission for an increase in fare. The commission in denying the petition states that the 7-cent rate was based upon so short an experience, and now when other costs of living are diminishing it would not seem advisable to fix a higher rate.

New Fare Schedule Filed.—The New Jersey & Pennsylvania Traction Company, Trenton, N. J., announces that a 10-cent fare will be put into effect on the lines in Pennsylvania beginning April 12. The present rate is 8 cents. It is proposed to sell five strip tickets for 35 cents from Trenton to Morrisville, Pa., but cash fare will be 10 cents on all lines. On the Yardley and Newton division the fare will be 10 cents cash or eleven tickets for $1. Riders on the Lambertville division will actually have their rate reduced, if tickets are purchased. There will be a saving of 10 cents if tickets are bought. The tariff schedule has been filed with the Pennsylvania Public Service Commission at Harrisburg, Pa., and the Interstate Commerce Commission at Washington, D. C. Although no change was expected in the 7-cent schedule between Trenton and Princeton, the company has recently applied for a 10-cent fare in each of its four zones between these two cities. The old utility board denied the company's petition to charge 8 cents. The board later issued an order suspending the proposed increase. In the meantime an inquiry will be made into the reasonableness of a 10-cent fare. The company wants the new rate to go into effect on April 12, when 10 cents will be charged on the divisions in Pennsylvania.

Personal Mention

J. R. Bibbins, Manager

Former Arnold Man Will Direct Recently Created Department of Transportation and Communication

James R. Bibbins, who has been a personal representative of Lieutenant-Colonel Bion J. Arnold, consulting engineer and president of the Arnold Company, Chicago, has been picked to manage the new department of transportation and communication, the creation of which was recently announced by the Chamber of Commerce of the United States. This department is one of the eight into which the chamber has been divided. Its range of activities will cover shipping, ocean and inland; steam and electric railroad transportation; air transportation, cables and telegraph; postal facilities and highways.

Mr. Bibbins brings to the new department a wide experience derived in consulting work, dealing with transportation problems of some twenty cities in the United States and Canada. He has had to do with rapid transit problems, railroad and port terminal activities, and civic development. He has studied the terminal problems of New York, Chicago, Baltimore, New Orleans, the transit plans of Chicago, San Francisco, Pittsburgh and other cities, and the valuation of property in New York, Brooklyn and Chicago.

MR. BIBBINS HAS WIDE EXPERIENCE

Mr. Bibbins has also had a wide experience in manufacturing and construction work. In 1902 he became associated with the Westinghouse Machine Company in East Pittsburgh, Pa., as a commercial engineer. During his connection with the Westinghouse interests his work included an intimate association with the development of prime movers, including gas engines, producers, turbines and condensers. Previously he had served in various technical capacities with the Detroit Public Lighting Commission, the Detroit Edison Company, and with the Detroit United Railway in operating and construction work. In 1909 Mr. Bibbins became associated in the work of the Public Service Commission of New York as assistant to Mr. Arnold, who at that time was a consulting engineer and director of appraisals on the commission. Mr. Bibbins was educated in Baltimore City College and the University of Michigan. He is a member of numerous engineering societies.

The chamber has long been active in transportation affairs. As a contribution of value to the railroad situation the chamber, in the latter part of 1918 and 1919, held a national transportation conference, bringing together all of the interests concerned with transportation. The results of this conference, together with the result of a referendum vote of the chamber's membership on proposals for rehabilitation of the roads, were laid before Congress, which at that time was considering railroad legislation.

Mr. Reynolds in Youngstown

Former St. Paul Man Appointed General Superintendent of Youngstown & Suburban Railway

A. L. Reynolds was appointed general superintendent of the Youngstown & Suburban Railway, Youngstown, Ohio, by the Municipal Service Company, whose service he entered on March 1. Mr. Reynolds has been foreman of the Snelling car station of the St. Paul City Railway. He was in the operating department of the Twin City Rapid Transit Company there for about twelve years.

A. L. REYNOLDS

Mr. Reynolds began his railway training in the operating department of the Northern Ohio Traction Light & Power Company in 1907. The following year he took a position as a salesman with the B. F. Goodrich Company, and after remaining with that concern for a year again took up railway work with the operating department of the St. Paul City Railway as supervisor of transportation. Before the entrance of the United States into the war in 1917 Mr. Reynolds went to the Second Officers' Training Camp at Fort Snelling, Minn. He received there a commission as first lieutenant in the infantry.

Upon his return to civil life in 1918 he became identified with the Minneapolis (Minn.) Street Railway. During the latter part of 1918 he conducted for the company many public meetings in connection with its campaign to explain to the people the cost-of-service franchise which the company was seeking to obtain from the city. This measure was defeated, but its failure to pass was ascribed to the limited time the voting public had prior to the election in which calmly to consider the matter rather than to any inherent defects in the measure itself.

In 1919 Mr. Reynolds was again transferred to the St. Paul City Railway by the Twin City Rapid Transit Company, and while with that company he acted as supervisor and also in various other capacities.

Mr. Reynolds was born in 1886 in Ashland, Ohio. He received his education in the grade schools of Akron, Ohio, and later attended Kenyon Military Academy at Gambier, Ohio. He is a graduate of Kenyon College, also in Gambier.

Paul Shoup Honored

Paul Shoup, president of the Pacific Electric Railway, Los Angeles, Cal.. and vice-president of the Southern Pacific Company, San Francisco, Cal., was presented by a group of intimate friends with a life-size painting of himself at a dinner given in his honor at the Hotel St. Francis in San Francisco on Thursday, March 10. The portrait is the work of Arthur Cahill, who has painted the portraits of many eminent men.

William Sproule, president of the Southern Pacific Company, made the presentation address. Others who paid tribute to Mr. Shoup were Julius Kruttschnitt, chairman of the executive committee of the Southern Pacific Company; William Clayton, vice-president of the Spreckels companies of San Diego; Harry Chandler, president and general manager of the Los Angeles *Times;* William F. Herron, vice-president and chief counsel of the Southern Pacific Company; Herbert Fleishhacker, and C. W. Durbrow, attorney for the Southern Pacific Company. The dinner was attended by practically all the officials of both the Pacific Electric Railway and the Southern Pacific Company besides numerous other friends of Mr. Shoup in the industry.

Messrs. Esch and Potter Appointed to I. C. C.

John J. Esch and Mark W. Potter were nominated on March 11 by President Harding for appointment to the Interstate Commerce Commission.

Mr. Potter has been serving on the commission under a recess appointment by President Wilson. He has been very active in the work of the commission, having had charge of that branch which dealt particularly with the financial matters within the commission's jurisdiction. Mr. Potter's nomination was confirmed by the Senate on March 12. His term ends Dec. 31, 1923.

Mr. Esch, who has been chairman of the House committee on interstate and foreign commerce, was appointed for the full term of seven years to succeed Robert W. Woolley, whose term expired on Dec. 31. Mr. Esch has manifested a special interest in railroad and transportation affairs in Congress and has played a very active part in the framing of railroad legislation.

Under the plan of rotating chairmanship, the usual change in the chairmanship of the commission will not take place in March this year but at the end of June, when ordinarily fewer cases are before the commission.

Jersey Senate Finally Confirms Commission Appointments

Governor Edwards of New Jersey on March 21 sent to the Senate for confirmation the names of Judge Harry V. Osborne and former Judge John J. Treacy, Democrats, to be members of the Public Utility Commission, to replace the nominations of James A. Hamill and Joseph S. Hoff, two Democrats whose names the Senate rejected. The nomination of Harry Bacharach, Atlantic City, the only Republican suggested originally by the Governor, has been confirmed by the Senate. The Senate in executive session also confirmed the nominations of Messrs. Osborne and Treacy.

Judge Osborne came into prominence in 1908, when he won the Democratic nomination for State Senator in Essex County and was elected, although he ran in the primaries as an independent Democrat. He served a term of three years, and in December, 1911, he was appointed to the Essex County bench by Governor Woodrow Wilson, where he has since continued to serve, having been reappointed in 1913 and again in 1918.

Mr. Treacy was graduated from St. Peter's college in 1891 and entered the New York law school the following year. He received the degree of bachelor of laws in 1894 and in 1895 was admitted to the New York bar, where he became associated with the firm of Reed, Simpson, Thatcher & Barnum, of which the late Speaker Thomas B. Reed was the head. He was admitted to the New Jersey bar in 1901, and has practiced his profession in Jersey City since that time. He was a member of the Assembly in 1902 and 1903. He was appointed judge of the Court of Errors and Appeals by Governor Wilson on Dec. 8, 1911. In 1913 Mr. Treacy resigned from the judgeship. In 1914 he was appointed a member of the Public Utilities Commission.

Messrs. Brooks, Jr., and Ives Advanced at Detroit

Frank W. Brooks, Jr., former assistant general superintendent of the Detroit (Mich.) United Railway, has been appointed assistant to the president and general manager for that company to succeed W. E. Cann, who resigned recently to become Street Railway Commissioner at Toledo, Ohio.

Edward H. Ives succeeds Mr. Brooks as assistant general superintendent of the company at Detroit.

Mr. Dana, President

Manager of Boston Elevated Elected Head of New England Street Railway Club

Edward Dana, general manager of the Boston (Mass.) Elevated Railway, was elected president of the New England Street Railway Club at its annual meeting held in Boston, Mass., on March 22. Mr. Dana succeeds I. A. May, comptroller of the Connecticut Company, New Haven, Conn. Mr. Dana is widely known in the electric railway field and is recognized as a specialist in transportation practice. The club may well be congratulated on having chosen a man of such proved ability to take the initiative in making the club of most value both to the industry and its members.

EDWARD DANA

Mr. Dana was born in Bernardston, Mass., in 1886. He took a preparatory course at Stone's School, Boston, and completed his academic course in Harvard in three years, graduating in 1907. Shortly after receiving his degree he entered the employ of the Boston Elevated Railway as a conductor and since that time has had experience in nearly every department of the road.

He became particularly interested in the scientific aspects of transportation and has made extended trips throughout the entire country in connection with railway problems. He is a very frequent and valuable contributor to the ELECTRIC RAILWAY JOURNAL, his articles dealing principally with detailed analyses of the various phases of transportation.

Mr. Dana has been prominent in the deliberations of the American Electric Railway Association, where he is considered an authority on transportation matters. He has also testified as an expert witness for the Interborough Rapid Transit Company before the Public Service Commission.

The rise of Mr. Dana to general manager of the Boston Elevated was exceptionally rapid. After gaining much practical experience as a conductor, he was made assistant to the superintendent of transportation and soon afterward became traffic superintendent. Having been transportation manager in charge of elevated and surface lines for several years, on August 8, 1919, he was selected as general manager by the Board of Public Trustees.

Mr. Moran Conducting a Publicity Campaign in Illinois

John J. Moran, of the Chicago, North Shore & Milwaukee Electric Railroad, Highwood, Ill., is traveling over the State of Illinois in the interests of the Illinois Committee on Public Utility Information. Mr. Moran is speaking before the Chambers of Commerce, the industrial organizations, men's and women's clubs, and before students in universities, colleges and the larger high schools.

It is the idea of Mr. Moran and of the Illinois Committee on Public Utility Information to inform the people of the real facts about electric railway investments in the United States. The people are also told the part which the railways take in the economic development of the country by citing the number of passengers and the amount of freight which they carry, and the number of men which they employ. It is hoped that the public by this method of education may be brought to appreciate the point of view of the railways in order that co-operation and good will may exist between them for their mutual benefit.

Mr. Armstrong Promoted

E. E. Armstrong, for the past two years general superintendent of the City Light & Traction Company, Sedalia, Mo., has been transferred to the Meridian Railway, Light & Power Company, Meridian, Miss., by the Doherty interests to hold a like position. Mr. Armstrong, in assuming his new duties, will be under General Manager W. B. Malone, at one time in charge of the commercial department of the City Light & Traction Company. No successor has yet been announced for Mr. Armstrong's place.

During the two years that Mr. Armstrong has been in Sedalia he has proved a most capable official and has made many personal friends in business and other circles. Previous to going there he was in service in the World War and before that time had been employed with the Doherty interests at Denver, Col., and at Bartlesville, Okla. For a time he was in the New York offices of the Doherty company.

N. K. Smith Made Superintendent

N. K. Smith, formerly trainmaster of the Indiana Service Corporation, Fort Wayne, Ind., has been appointed superintendent of the Fort Wayne, Van Wert and Lima line of the Ohio Electric Railway. His appointment was recently announced by S. W. Greenland, general manager for the receiver of the Fort Wayne-Lima line. Mr. Smith will locate in Van Wert and will be in active charge of the operation of the road.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Good Stocks of Rattan Car Seating Material

Present Prices Represent Ten to Fifteen per Cent Reduction from Peak—Rattan Cost Unchanged

Though there has been no price change in the car seat market now for several weeks present quotations of rattan car seating material represent manufacturers' reductions of from 10 to 15 per cent compared with peak prices. At the same time rattan for snow sweepers was reduced about the same amount. Finished rattan seats for electric railways have been reduced slightly since the first of the year, but prices of seats furnished to steam roads remain at their peak. There is keen competition among buyers of rattan in the Far East at present, for demand is said to be strong from a number of sources other than the railway industry, and foreign countries are buying more of this material now too. Consequently the cost of rattan is as high as ever.

Ship bottoms are plentiful and car seat manufacturers here can obtain a supply of rattan in approximately three months. A sizable reserve supply is kept on hand sufficient to insure stock deliveries of repair material at the present time. The favorable delivery situation is further augmented by the light buying of steam and electric lines. A fairly good volume of business still remains from orders placed some time ago, and manufacturers are hopeful that this will tide over production on a curtailed basis until the looked-for improvement in demand materializes.

Railway Material Prices in England Show Large Increase Since 1914

To those familiar with the big increase in cost of virtually all material used by electric railways since before the war, the following table affords an interesting basis of comparison with the cost increase along kindred lines in England. The figures are prepared by the manager of the West Ham Corporation Tramways, England. The percentage of price increase for fifteen items in 1918, 1919 and 1920 over prewar prices is presented. The table is similar to one appearing on page 1287 of the June 19, 1920, issue of ELECTRIC RAILWAY JOURNAL, covering the price at that time of 52 items used by traction companies in this country, in relation to existing prices in 1914 and 1919. Of the eight items which appear in both tables, the average percentage of price increase in 1920 over 1914 is 127 per cent in this country and 184 per cent in England.

	1918 Per Cent	1919 Per Cent	1920 Per Cent
Axles	100	226	196
Tires	156	206	283
Gear wheels	80	175	175
Pinions	233	350	216
Trolley wire	85	100	33
Motor grease	150	216	176
Oil light journal	236	250	240
White lead	100	140	255
Bolts and nuts	165	226	274
Span wire	120	180	180
Tickets	143	157	200
Trolley wheels	73	80	80
White metal	66	83	89
Timber	60	70	75
Print'g and stationery	250	350	350

Stock Deliveries of Paint

Electric Railways Showing Little Interest in Spring Painting Market

Buying of paint by electric railways thus far this year has been negligible. Traction companies are not only avoiding stocking this material but they have also given little indication that there will be the usual amount of spring painting of cars done this year. There is some buying for immediate needs, it is true, and this combined with general demand has provided a fairly good volume of current business, several producers report. Optimism is quite generally expressed to the effect that total sales this year will equal the figures of 1920, as the general expectation is that demand even from steam and electric railways will increase considerably before long. Paint producers think that difficulty in readjusting wage scales on the part of both electric and steam lines is an important factor in delaying buying.

Stocks of finished paint in general are not large for production in a number of instances has been curtailed to a point commensurate with buying. The surplus supply is adequate, however, to insure present delivery from stock in virtually all instances.

Prices on paints used by electric railways have declined anywhere from 25 to 50 per cent compared with peak quotations. There has been no general reduction for more than a month, however, and several manufacturers state that in their opinion the market has hit bottom. On the other hand, it is admitted there is some slight room for lower costs through wage readjustments, but this will not be felt for quite some time.

White lead in oil in 100-lb. kegs, lots of less than 500 lb. is today quoted at 13 cents New York, compared with 14¼ cents on Dec. 1, 1920; raw linseed oil in 5-bbl. lots is worth 68 to 69 cents per gallon compared with 85 cents on Dec. 1, 1920; and turpentine in barrel lots is quoted at 58 cents per gallon compared with 95 cents on Dec. 1, 1920. Varnish gums have declined about 40 to 60 per cent from their peak prices.

Heavy Declines in Scrap Steel Prices

There Is Little Activity in the Market, However, and Quoted Prices Do Not Represent Real Values

With the low prices prevailing there is little incentive for railways to sell their steel and iron scrap except to get rid of stock or to realize what can be realized on the transaction. The market is very quiet, with here and there a sale reported. Dealers feel that this scrap is a good investment at the present time and that general prices can go little lower. They see a quick return to higher prices when the demand for scrap does set in though, regardless of the uncertainty as to when that time shall come. As has been the case heretofore, this demand will be felt directly after that in the steel trade shall set in.

Quoted prices are felt to reflect no true condition of the value of steel scrap but merely the figures at which railroads, etc., will release their materials. There is little scrap coming from new manufacturing. The steel mills are not using much of the material under their curtailed operation but railroads are taking every advantage in reclaiming springs, bolts, axles, etc.

RAILROADS LARGELY GOVERN PRICES

Prices even since Jan. 1 show extensive reductions. For instance, in the Chicago market old steel axles are off \$2.50 to \$14.50-\$15.00; old iron axles are off \$3.50 to \$26.50-\$27.50. Steel springs show a \$4.50 drop to \$13.50-\$14.00, while machine shop turnings are off 50 cents to \$5.50-\$6.00. These are all for net tonnages. In gross ton lots since Jan. 1 car wheels are \$7 lower to \$14.00-\$14.50; railroad malleable \$2.40 to \$15.50-\$16.00; frogs, switches and guards are off \$2.50 to \$12.00-\$12.50, and old steel rails, short, are \$1 low to \$13.00-\$13.50. It is felt that some of this material, notably old rails, could be purchased under these figures, but there seems to be insufficient storage space with the dealers to purchase large amounts to hold in storage for any considerable time awaiting a market return.

Heavy tonnages of scrap have been sold by the Pennsylvania Railroad Company since the first of the year at quoted prices on the days of sale.

Electric Railway Proposed in Norway

The commercial secretary to his Majesty's Legation at Christiania, according to the London *Electrical Times*, states that the Norwegian Government has granted a concession to "A/S Akerabanerne" to construct an electric railway from Majorstuen through Taasen to Sognsvandet, and from Taasen to Sagene, a suburb of Christiania. Preliminary work in connection with the grading of the proposed route will begin at once. Tenders will not be issued until the end of the present year. Application has recently been made to the Norwegian Government by "A/S Akerabanerne" for a further concession in connection with a proposed railway from the center of Christiania to Ostensjo, a distance of about eight kilometers. If the latter concession is granted it is proposed to construct both lines simultaneously.

Wire Production Curtailed Under Light Demand

Prices Ruling on All Classes of Bare and Insulated Wire Are at Extremely Low Figure

Manufacturers report that demand for insulated wire is quiet. Jobbers are still for the most part endeavoring to get rid of supplies on hand, contractors have not much to do except small repair jobs, the promise offered by a return of the building industry yet hangs some months off on the horizon and utilities are short of money. For these reasons producers apparently do not expect a return of strong demand in the near future. Production is considerably curtailed, operation at from 50 to 75 per cent of capacity being about the general average. Stocks are gradually piling up, however, and deliveries are prompt, with shipment from stock up to a matter of two weeks prevailing.

Prices Reflect Extreme Low Level of Raw Materials

Prices are thought to have reached rock bottom as copper, cotton and rubber are all about as low as they can go, it seems, while wage reductions have also been made to some extent. Consumers in many cases admit that present wire prices are attractive but say that money conditions prevent their stocking up. A carload lot of No. 14 rubber-covered wire is quoted by several representative producers at from $7.50 to $7.75 per 1,000 ft., but it is known that these quotations have been cut considerably by smaller producers. An average base working price for weatherproof wire at the present time would probably be about 16 cents, though most manufacturers are not quoting base prices.

Bare-copper wire business presents much the same conditions as does insulated wire. Utilities are buying some but not much, and demand from electric railways is very largely only for repairs. The finer sizes of bare wire, which last summer were so hard to obtain, are now even in less call than the large sizes, and stranded wire, as demand for purposes such as small motor manufacture, is especially slow. There is considerable optimism, however, regarding prospects of present conditions improving. Deliveries of bare copper wire are all that can be desired, as orders are filled in about ten days to two weeks. A representative base price would be about 14½ to 15 cents.

Manufacturer of Gear Cases Again Reduces Price

One of the large manufacturers of sheet steel gear cases has reduced the price on this product approximately 5 per cent effective March 15. So far as can be learned other producers have not followed this company's example in again reducing prices. The reduction mentioned above follows a cut of 7 per cent made by this company early in January. Other manufacturers soon after that followed suit with reductions of about 10 per cent on both sheet steel and malleable iron gear cases, the price decreases taking effect the middle of January and the early part of February in different instances.

Present demand is not large and although deliveries are prompt several manufacturers report that they are not carrying overly big stocks. This is perhaps due to a feeling that prices of the raw material have not yet reached rock bottom.

Westinghouse Drops Price of Small Supply Items

Effective on March 10 the Westinghouse Electric & Manufacturing Company has again reduced prices on the 60,000 to 80,000 supply items contained in catalog 10-A. The reduction varies, but averages on the whole about 6 per cent. Included in the items affected are commutator and controller copper parts, resistance grids, armature and field coils, brush holders, transformer replacement parts and parts for electrical machinery in general.

Rolling Stock

Centralia (Ill.) Traction Company has purchased four standard double-end safety cars from the National Safety Car & Equipment Company, St. Louis, Mo.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., has purchased four standard double-end safety cars from the National Safety Car & Euipment Company, St. Louis, Mo., for use in Eau Claire.

Tidewater Southern Railway, Stockton, Cal., which operates between the cities of Stockton, Modesto and Turlock, Cal., has purchased a 60-ton electric freight locomotive from the General Electric Company. Delivery is to be made early in the summer in time to handle the crop movements which make up a considerable portion of the freight business on this line. The company has pending before the California Railroad Commission an application for the issue of $49,000 of first mortgage 5 per cent gold bonds for security on a promissory note to be applied on the purchase of the new locomotive.

Franchises

Ontario, Canada.—Representatives of the municipalities of Galt, Preston and Kitchener have asked the Ontario government to open the way for Galt and Kitchener to enter into agreements between the municipal corporations and the Grand River Railway, a subsidiary of the Canadian Pacific Railway, for an extension of the existing franchises. Under the old Beck act the municipal councils can give an extension only for a year without a vote of the people, and under the agreements signed in connection with the Elmira, Galt, Preston and Hamilton radial system such an extension is further made subject to the Ontario Power Comission sitting as a court and hearing the views of other interested municipalities. Premier Drury promised consideration.

Track and Roadway

Phoenix (Ariz.) Railway. — The Phoenix Railway has begun work on the various improvements ordered by the commission. The crossings at Tenth Street, Willetta and Brill Streets have been paved. The commission outlined an improvement plan some time ago with the condition that if the company failed to do the necessary work the city would start the work and bill the company. The city was about to begin the work when the railway started paving.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway will put in new rail, ballast and paving on South Mt. Vernon Avenue, San Bernardino at a cost of $33,000.

Indianapolis (Ind.) Street Railway.—The Indianapolis Street Railway will be asked to make many extensions to its line according to George Lemaux, president of the Indianapolis Board of Public Works. The following are proposed: Extension of College Avenue line from Forty-sixth to Fifty-first Street; removal of tracks of Meridian Heights line now in Forty-ninth Street from Pennsylvania Street to College Avenue and relay them in Pennsylvania Street from Forty-ninth Street to Fifty-second; extension of Illinois line from Thirty-ninth Street to Forty-sixth.

United Railways & Electric Company, Baltimore, Md. — The United Railways & Electric Company has extended its St. Paul Street line from Thirty-first Street and Greenmount Avenue over the Gorsuch Avenue route.

United Railways & Electric Company, Baltimore, Md.—The United Railways & Electric Company has received petitions urging better service in certain sections of the city. The principal plan under consideration is to correct the present rush-hour congestion for through trains on Fulton and Pennsylvania Avenues. To remedy this a tube under Druid Hill Park is proposed. It would mean the first underground operation of electric cars in Baltimore.

Southern Public Utilities Company, Charlotte, N. C.—The Southern Public Utilities Company operating in Greenville, S. C., has been granted permission to build a double track line on Pendleton Street, Greenville, which will afford better facilities from the western and southern suburbs to the city. All work incident to street widening will be undertaken by the railway.

Oklahoma Railway, Oklahoma City, Okla.—The Oklahoma Railway is considering various routes for a new extension to Lincoln Park in Oklahoma City. Construction of the line will require about sixty days and will cost approximately $40,000. One plan is to extend the McNabb line to Lincoln Park, making the total length of the two lines 2½ miles.

Cincinnati, Ohio. — Estimates for Section 4 of the Rapid Transit Loop, Cincinnati (Ohio), were approved recently by the Rapid Transit Commission. City Engineer Frank Krug, estimated that it would cost $506,408 to build that part of the loop from Mohawk to the Brighton Bridge. After the estimates were approved Mr. Krug was directed to start advertising. April 1 for bids.

Johnstown (Pa.) Traction Company.—The Johnstown Traction Company will start work on improvements within the next month. An investment of $248,000 will represent the total trackage improvement which will include rebuilding the Franklin Street line and relaying track on the Horner Street line.

Reading Transit & Light Company, Reading, Pa.—The Norristown Town Council has adopted a resolution that if the Reading Transit & Light Company does not begin the work of repairing streets over which the trolleys operate in Norristown before April 15 court action will be taken. The railway has delayed this improvement because of lack of funds.

Power Houses, Shops and Buildings

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md. — Work will be started on the new $850,000 station and terminal of the Washington, Baltimore & Annapolis Electric Railroad on April 1. This station will be located at Howard and Lombard Streets. It will be equipped with every modern convenience.

Public Service Railway, Trenton, N. J.—The Public Service Railway has informed the City Commission of Trenton, N. J., that it cannot afford at this time to build the proposed trolley terminal at State and Warren Streets, Trenton. The company some time ago purchased the old Trenton Bank, a marble structure, for the purpose of housing its cars in the center of the city and providing a waiting room for passengers. The Trenton Commission requested the railway to have a representative before it and explain matters.

Professional Notes

Dwight P. Robinson & Company, Inc., are the designers of the new shops for the Boston Elevated Railway, described and illustrated in the issue of this paper for March 19, page 555.

McKay & Sherman, 741 Monadnock Block, Chicago, has been formed by Charles W. McKay and P. C. Sherman for the practice of engineering valuation of industrial and public utility properties.

Trade Notes

The Bethlehem (Pa.) Steel Company announces the appointment, effective at once, of E. E. Goodwillie as sales agent in charge of its Cleveland office.

The Automatic Reclosing Circuit Breaker Company, Columbus, Ohio, announces the opening of an office at 510-512 Brown-Marx Building, Birmingham, Ala., in charge of B. M. Rogers.

The American Atmos Corporation, Pittsburgh, manufacturer of the Atmos and Dreager oxygen resuscitation and breathing apparatus, announces the appointment of George Oliver Smith as vice-president and chief engineer.

The Cincinnati Electrical Tool Company, Freeman Avenue, Cincinnati, Ohio, has been authorized to increase its capital stock from $75,000 to $225,000. The company, it is stated, does not contemplate any immediate extensions.

The Independent Pneumatic Tool Company, 600 West Jackson Boulevard, Chicago, announces the removal of its Pittsburgh office from 1208 Farmers' Bank Building to 718 Bessemer Building, Sixth Street and Duquesne Way.

The Simplex Wire & Cable Company, 201 Devonshire Street, Boston, announces that it has made arrangement with the Eastern Engineering Company, with main offices in Tampico, Mexico, to handle its products in that country.

The Simmen Automatic Railway Signal Company, manufacturer of speed control devices, cab signals, block signal systems and automatic recorders of train movements, has moved its offices from Buffalo, N. Y., to Eden, N. Y.

The Celluloid Zapon Company, 200 Fifth Avenue, New York City, manufacturer of lacquers, insulating varnishes, lamp frostings, etc., announces the opening of its Philadelphia office at 520 Walnut Street, in charge of B. O. Clausen.

The Wagner Electric Manufacturing Company, St. Louis, announces the removal of its Boston office and service station to 342 Newbury Street, where it will occupy the entire building. Brooks Faxon will continue in chage as district manager.

The Keystone Hair Insulator Company, 1243 Spring Garden Avenue, Pittsburgh, manufacturer of electrical equipment, is reported to be receiving bids for the erection of a three-story building, 70 ft. x 100 ft., in the vicinity of its present plant.

The Hazard Manufacturing Company, Wilkes-Barre, Pa., manufacturer of wire rope and electrical wires and cables, has opened a new sales office and warehouse at 1701-1703 First Avenue, Birmingham, Ala., in charge of R. J. Bravard, district manager.

The Brandywine Fibre Products Company, Wilmington, Del., announces that it is now in a better position than ever before to take care of hard vulcanized fiber tubing in standard mill lengths or parts machined to order. The company has recently doubled its capacity in floor space and trebled its equipment.

The Acme Wire Company, New Haven, Conn., announces the opening of its Chicago office at Room 1105, Monadnock Block, 53 West Jackson Boulevard, in charge of H. B. Bassett. The company also maintains branch offices in the Guardian Building, Cleveland, in charge of J. T. Crippen, and in New York City at 52 Vanderbilt Avenue, in charge of H. S. Glasby.

The American Insulator Corporation, New Freedom, Pa., announces the appointment of the Albert J. Cox Company, 564-570 West Monroe Street, Chicago, as its sales representative in the States of Illinois, Indiana, Missouri, Iowa, Minnesota and Wisconsin. The Albert J. Cox Company will handle the "Aico" line of products, consisting of cold-molded insulating parts for electrical units.

New Advertising Literature

Diesel Engines. — The Busch-Sulzer Brothers Diesel Engine Company, St. Louis, is distributing a bulletin describing its Diesel engines in large hydroelectric, stand-by and auxiliary plants.

Boiler Plant Economy. — The H-S-B-W Cochrane Corporation, Philadelphia, has issued a second revised edition of "Finding and Stopping Waste in Modern Boiler Rooms." The book is cloth bound and contains 414 pages.

Circuit Breaker. — The Automatic Reclosing Circuit Breaker Company, Columbus, Ohio, is distributing its new bulletin No. 312, which covers the theory of operation and application of the automatic reclosing circuit breaker.

Safety, Sanitation and Welfare.—The Bureau of Safety, Sanitation and Welfare of the United States Steel Corporation, 71 Broadway, New York City, has issued bulletin No. 8, containing ninety-five pages of illustrations of what has been done to improve living and working conditions of employees.

Line Equipment.—The Electric Power Equipment Corporation, Thirteenth and Woods Street, Philadelphia, has issued bulletins Nos. 103, 104, 200, 202, and 600, covering its indoor choke coils, copper fittings, pole-top switches, outdoor bus supports and control switches respectively.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, April 2, 1921 *Number* 14

How Far Does It Pay to Cut Expenses?

ON MANY an electric railway property it has been necessary to reduce expenses almost regardless of the results, and even to refrain from making expenditures which would have earned the interest rate several times over. Such procedure has "gone against the grain" with the thrifty manager who realizes that he or his successor must pay for this enforced parsimoniousness in the long run. Of what use is it to offer a man a 25 per cent investment if he has no money or credit? Many a railway has seemed to be in this position during the past few years.

Nevertheless, there is a limit to which expenses can be cut if a road is to be kept operating at all. If track and equipment are allowed to run down, sooner or later the earning capacity of the property is impaired. Either the railway physically will not be able to carry passengers or people will not want to ride on account of the shabbiness of the cars and the discomfort of travel. Therefore, before any more requests for maintenance or more service are turned down such questions as these demand answer: Have all possible economies in maintenance and in conducting transportation been located? Does the public which is holding down the fare fully understand the situation? Have all available means for securing new business been considered? Will the proposed curtailment seriously impair the service now and later? Have the best brains on the property and within reach elsewhere been exercised to the limit in trying to answer such questions as these?

The making of drastic cuts may be the only thing to do in some cases, but there is talent enough in the industry, financial, managerial and technical, to render the cuts less necessary if this talent is utilized 100 per cent. And this does not imply disparagement of the splendid results that have been and are now being achieved.

Route Vehicular Traffic to Avoid Main Intersections

IN MANY smaller cities the intersection of the main north-south and east-west thoroughfares is at the center of the business district. These two streets are usually occupied by the main street car lines and they also serve as the principal lanes of automobile and other vehicular traffic, thus focusing nearly all of the city's traffic at one point of intersection. This results in a bad congestion which should be corrected to the advantage of every one. It can be done simply and readily in almost every case with the co-operation of the police department if all through vehicular traffic is detoured one block to the right at the first corner before reaching this main intersection. This would clear the main intersection of practically all but the street car traffic which cannot be readily rerouted, would speed up materially the street car service through this intersection, would make the crossings much safer for pedestrians, and would very greatly help the rapid movement of automobiles through the downtown section.

The scheme would mean a two-block square in the center of the city, inside of which there would be only street car and pedestrian traffic, and around which automobile traffic would travel as it does around the circles in Washington. The total number of intersection movements occurring formerly at the one point would be divided between four points in a manner which would eliminate all holding of one-direction traffic while permitting the other-direction traffic to pass. This same scheme could also be used effectively in large cities to alleviate congestion at various outlying heavy-traffic intersections which are of much the same character as the one main intersection in a smaller city. The merchants located within the square would probably object, but the harmful effect on them would be questionable, while the advantage to every one else would be real and apparent.

Railway managers should make periodical speed observations on all sections of their lines where there is much congestion, and it is safe to say that if this is done startling results will often be obtained. Car-hours will pile up rapidly on an obstructed street, and in that case the thing to do is to appeal to the authorities for relief.

Adjusting Service as Traffic Changes

A CERTAIN railway company was operating three-fourths of its cars over the full length of a route and the remainder of the cars were turned back about three-fourths of the distance out. Traffic surveys showed that the interests of the riders on that line would be better served and thousands of car-miles saved annually if 50 per cent of the cars were turned back at a point midway between terminals. This recommendation was made to the management, but was not acted upon because there was no crossover at the street where it was proposed to "short line" part of the service.

Here is an instance of short-sighted economy which unfortunately is too common among railway men. A system is laid out originally with crossovers and other special work placed for the existing needs of service. In course of time the riding habit of patrons of the various routes changes and common sense indicates that the service should be graduated to meet their demands. Here comes the question of installing some new special work at a certain cost or of wasting that much or more annually in unnecessary car mileage.

It is one thing to have the defects of a system pointed out and another thing to act upon them. There is a field for traffic study on every railway property, and the deficiencies are usually more readily apparent to a trained expert who comes on to the system with a fresh viewpoint, free from operating responsibilities and with no local prejudices. Such an engineer will consider the traffic characteristics of a line and determine whether there is any excess or shortage of service on the system as a whole or on any of its parts. He may find that seats exceed passengers even in rush hours and the natural remedy would be curtailment of service. Some lines will be found with slower speed than others, and if this is not due to more short-haul riders or a greater number of traffic interferences, the schedule should be shortened. Excessive layover time may be found and if this is not called for by contract with the employees, the pruning knife of the time-table maker should be applied. Some long lines may be found overlapping shorter ones, and again the traffic engineer might suggest elimination of duplicate service.

There are so many angles to be considered in the revision of schedules, however, that the railway executive is at times justified in "hastening slowly" even on the recommendations of a traffic expert. Local conditions have to be weighed seriously. Too sudden a shifting of service, even though warranted from the company standpoint, may not be good policy. The changes are more likely to "stay put" if they are made more slowly and thus not arouse public resentment. This does not mean that the company should mark time indefinitely while a real sacrifice of costly car-hours continues. Wasteful service will benefit no one, and the careful operator will know when and where to suit his facilities to the demands of the riders. This is the test of good judgment.

Is Public Ownership of Utilities Inevitable?

THAT it is, was the conclusion reached by an eminent engineer in a paper recently presented at a society meeting. Many good reasons were given to show that this is the logical outcome of present conditions. Thus the fact was pointed out that the rates and consequently the receipts of the companies are absolutely controlled by the authorities, while the expenses are also very largely determined by them or by circumstances over which the utility has no control. With service at cost, which is now coming into more general use, the argument perhaps is even stronger, and the author of the paper mentioned pertinently inquired what is the use of the stockholders when all business risk has disappeared. Why not simplify the relationship by having public management function direct? he asked.

Undoubtedly private ownership in such circumstances is somewhat of an anomaly. Its excuse is that public ownership of utilities under the political conditions which exist in most of our cities is still more of an anomaly. The fact is that the American municipality is not organized to conduct a commercial enterprise efficiently. The city fathers, as a rule, are not chosen for their business sense but for their ability to get votes. These two qualities rarely go together. But even if the business knowledge of the average city council and mayor was adequate to the task, if they agreed to discard politics in their management of the property, and if they had the courage to carry out such a program, there would still be the fatal weakness in municipal operation of frequent change in administration.

Service at cost, although it may have its drawbacks in the way of reduced incentive, has its continuous administration which can be kept keenly attentive to its work by the city transit administration. There are thus two interests, the railway and the city executive, watching each other, so that there is far less likelihood of the utility failing to do all it can than if the business was conducted by the city officials only, with no one with sufficient interest or authority to watch what they were doing. Finally, there is far less opportunity for politics to influence a private management, practically irremovable during good behavior, than a political management dependent for office on popular vote every two or more years.

Private ownership and operation may have its defects in the way of efficiency and economy, but that of the public would be much worse.

Cash from Casuals, Tickets from Regulars

A COMPILATION recently made by the statistical department of the American Electric Railway Association shows that in 1920 fifty-seven cities with a population of 25,000 or more were charging a 10-cent base cash fare, as against only twenty-five in 1919 and none in 1918 or 1917. The number of cities with other fares higher than 5 cents were as follows: Six cents in sixty-one, 7 cents in eighty-nine, 8 cents in twenty-three and 9 cents in four. The compilation also shows a considerable increase in the number of companies in cities above 25,000 population which are selling tickets at a lower rate than the single cash fares. These cases are especially numerous where the cash fare is 7 cents or more. The tendency toward a 10-cent fare is especially marked in the eastern part of the country, while that toward a ticket rate applies to all sections. The ticket rate generally has not been put in as a reduction over a previous cash rate but at the time that the cash rate has been increased, and its purpose evidently has been to make the increase more acceptable to the frequent rider.

One great advantage of the 10-cent fare, whether accompanied by the ticket plan or not, is that a single coin or token may be used to pay the fare. This is an advantage for both passenger and company. In fact, it was to retain this advantage that so many companies held on to the 5-cent fare long after it became inadequate. The single coin is a time saver both to the conductor and the passenger, and as the 10-cent coin is the one of the next higher denomination to the 5-cent nickel it possesses obvious advantages from this point of view.

The principal argument against the 10-cent fare for a uniform fare is of course its amount and the extent to which it may discourage traffic, particularly the short-haul business. It is not the purpose here to discuss the relative merits of flat fares versus zone fares for urban service to stimulate short-distance riding, but the question of tickets and cash fares in a property which has a flat fare. For such conditions many companies favor the 10-cent fare and believe that the benefit of any reductions should go to the frequent rider through the establishment of a ticket rate. Such a plan makes the casual customer and the stranger pay the higher retail rate, whereas the regular user gets the discount usually accorded to wholesale purchasers in other lines of business. Another advantage of the ticket rate is that it allows changes of small percentage in the rate, either up or down, by a change in the number of tickets sold at a stated price.

The new plan of the Boston Elevated Railway now being tried in Malden and Everett carries out the policy outlined so far as the single coin fare is concerned because 5 cents will be charged for the local suburban ride, while 10 cents will be charged for the long urban ride into Boston.

More Business for the Interurbans

MORE business requiring more car-miles of service and resulting in better car-mile earnings is what is most needed by the interurban railways. But how can it be had?

More business can be secured if a company is prepared to go after it determinedly with the kind of service that is wanted. This means prompt and efficient freight service and fast, comfortable passenger service with a very great extension of through runs. The matter of service is now more important than ever because the steam railroads, faced with a tremendous falling off of both passenger and freight haulage, are going to almost any ends to secure business. This applies particularly to the freight business, where it is always possible to make offers of service more attractive to shippers than given heretofore, and to make good on such offers during dull times. This points to the absolute necessity for the electric freight carriers to be very much "on their toes" in keeping the service up to a high order of excellence for present patrons, and in waging a very energetic campaign for any new business in sight. In other words, the competition of the present time is extremely keen, and it can be met only with a traffic department that is wide awake and backed up by an operating department well aware of the kind of service it must deliver to meet the situation.

Cultivation of the farmers is productive of a good quantity of profitable business. The farmers of Indiana wanted electric freight service badly enough to secure passage of a bill permitting the interurbans to haul livestock through the streets of any city. The service which the electric lines can give the farmer saves him money through substantial reduction in shrinkage of stock. This kind of business, together with all of the sugar-beet, garden produce and dairy product shipments that may be secured (and best secured by encouraging the building by the farmers of community sidetracks) makes a total of freight tonnage well worth going after. Little informal way-station meetings of an official of the company with a group of farmers, serving to give the latter an intimate contact with the company and an opportunity to voice their needs and petty complaints, are of wonderful value in winning friends for the company and incidentally business.

Special attention to through train service as a means of increasing the passenger business is worthy of consideration. Two recent efforts along this line will show in fewest words what can be accomplished. Two new fast through trains between Indianapolis and Fort Wayne recently inaugurated were carrying seventy-five passengers a day each way in less than thirty days, and it soon became necessary for the cars to haul trailers. During the first forty-five days of operation, only three trains were late. The cars are cleaned inside and out at each end of the trip, as with the treatment given in the yard service of the Pullman cars. The character of service undoubtedly had a great deal to do with the success attained. More recently the through service inaugurated between Indianapolis and Louisville, with fine new cars running on a fast schedule, has met similarly with almost immediate success.

These are just a few of many things that are available for interurban lines to do to improve their financial conditions. It is not as though there were nothing left to do. The main point is to get busy and set aside the old obstacles that have been permitted for years to stand in the way. If there is determination, it will be found that most of these obstacles are not controlling.

Take Up the Slack in the Railway Industry

MR. HOOVER was the logical man to head an investigation into the causes of industrial waste. His regulations during the war, exemplified by his call for a "clean platter," taught the public the evils of waste, and it is notable that the first extended undertaking of the Federated American Engineering Societies under Mr. Hoover's direction should be to study the causes and attempt to reduce the waste in industrial undertakings. There are many of these causes of industrial waste. They include unemployment, failure to secure maximum output from the individual due to misfit or other cause, lack of standardization, mismanagement, failure of industries to co-ordinate, and so on. All of these are being studied in ten representative industries by the Federated Engineering Societies to see what relief can be obtained.

The electric railway industry should profit directly and indirectly from this investigation—directly from the lessons which will be derived, indirectly because in periods of business stress its traffic falls off, since the public does not have the money to spend on carfares. The benefit to the nation of having all its productive energies utilized, or with even half of the present waste eliminated, should be tremendous. Waste is the biggest tax the nation has to pay, and it is hard to imagine anything which would add more to our national prosperity than greatly to reduce the size of this tax.

The railway industry will be prepared to do what it can to co-operate when the report of this committee is rendered. In the meantime causes of wastes where detected should be removed in the general interest.

Quotation from the Federal Electric Railways Commission Report

No. 14

THE commission is unanimous on this point: That there has not been sufficient experience with public ownership and operation of street railways in this country to enable us to recommend it as a permanent solution of this problem. In some of the foreign countries it has apparently worked well. We do not believe under present conditions that this method of operation would be successful in most of the cities of the United States today.

* * * * * *

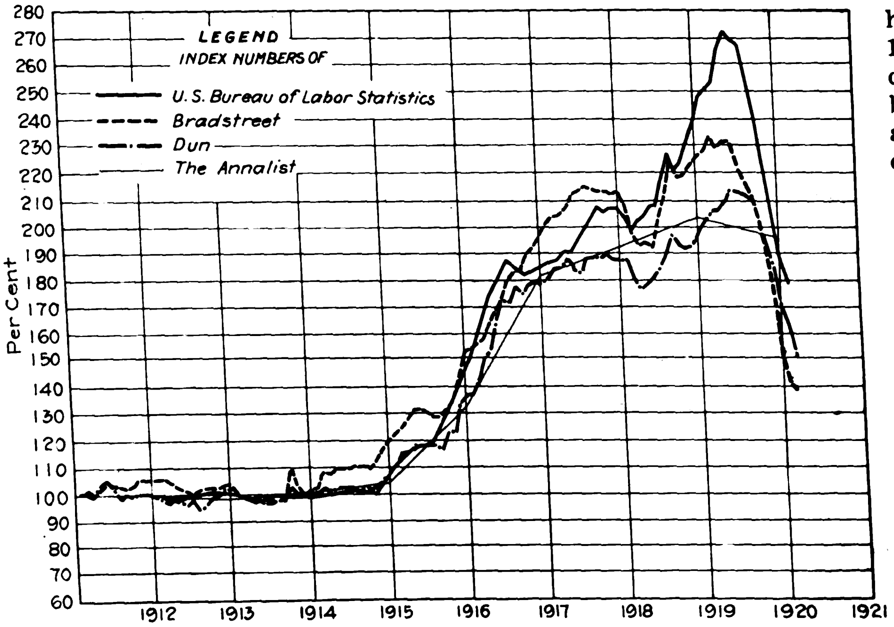
We are certain that much can be accomplished by private initiative, stimulated and aided by thorough public regulation; that the final solution could, in many communities, be found under private management, and that in any event, the reforms which have been urged by the commission should be instituted, since those reforms would serve to place the relations between the street railway and the public upon a more just and equitable basis.

Living Costs and Wages

The Standard Index Numbers Are Charted by Months for the Period Beginning Before the War and Show a Marked Falling Off in Prices Since the First Half of Last Year—Figures Are Also Given for Wages and Unemployment

By JOHN F. LAYNG
Member of the Firm of Hemphill & Wells, Consulting Engineers, New York

NEARLY every newspaper now contains some reference to wage reductions, decreased living costs and the financial embarrassment of the local traction system. The question naturally comes up, what can we find out about these things which are a matter of universal concern? Let us consider, first, the street railway situation. This can be understood in a few minutes, if we have the company's operating report. Very few of these companies have been meeting their capital obligations. Many have not had sufficient income to pay operating charges, the deficit being made up by borrowed money and deferred maintenance.



FLUCTUATIONS IN WHOLESALE PRICES OF COMMODITIES

The reason for so many unfavorable operating reports is the abnormal increase of labor and material costs within recent years without a corresponding increase of income. It is the purpose of this article to show the extent of this increase and the present trend of these prices.

There are definite and reliable guides of the trend of retail prices on which we can base our judgment. These are the index price numbers of the five leading authorities in this country, which are Bradstreet, Dun, the Annalist, the United States Bureau of Labor Statistics and the National Industrial Conference Board. Each of these will be considered individually.

BRADSTREET'S INDEX PRICE

Bradstreet takes the wholesale prices of ninety-six basic commodities, which are supposed to be representative of average price conditions in trade. These articles include breadstuffs and other foods, live stock, raw and manufactured textiles, metals, coal and coke, mineral and vegetable oils, naval stores, building materials, drugs and chemicals, and miscellaneous articles. The wholesale price per pound of each article is listed and the totals added. The grand total is Bradstreet's Price Index Number. If the figure for Jan. 1, 1912, is taken as 100 per cent, the wholesale high level price during the recent abnormal period was 233.1 per cent, this being on Feb. 1, 1920. On April 1 prices had dropped to 231.4 per cent, but on May 1 prices were 231.6 per cent. Since that time they have declined very rapidly and on Feb. 1, 1921, they had receded to 138 per cent. The various fluctuations month by month from 1912 to the present are shown graphically in the chart on this page.

DUN'S INDEX NUMBER

Dun's Index Number has the scientific foundation of a proper regard for the relative importance in per capita consumption throughout the country of each of the many articles used in its compilation. On the business day nearest to the first of every month about 300 wholesale quotations are taken, and these are separately multiplied by a figure determined upon as the estimated per capita consumption of each of the many commodities embraced by the record. The results are then grouped under seven heads, the total of all representing the actual cost of a given quantity of goods in the wholesale markets at the specified dates. Through the use of a per capita consumption factor in this index number, wide fluctuations in an article little used do not materially affect the total, whereas changes in the great staples have a larger bearing on the general result. The per capita consumption multipliers used do not change with the varying prices. If Dun's Index Number of January, 1912, is taken as 100 per cent the highest wholesale prices were reached in May, 1920, when the value was 213 per cent of the January, 1912, prices. Since then prices have continually dropped, until in February, 1921, the value was 150 per cent.

THE ANNALIST INDEX PRICE NUMBER

Wholesale quotations of twenty-five food commodities are used as the basis of this index number, the articles being so selected as to represent a theoretical family food budget. The prices used are New York and Chicago quotations. The index price number is obtained by computing the simple arithmetical mean of the relative prices of the different commodities.

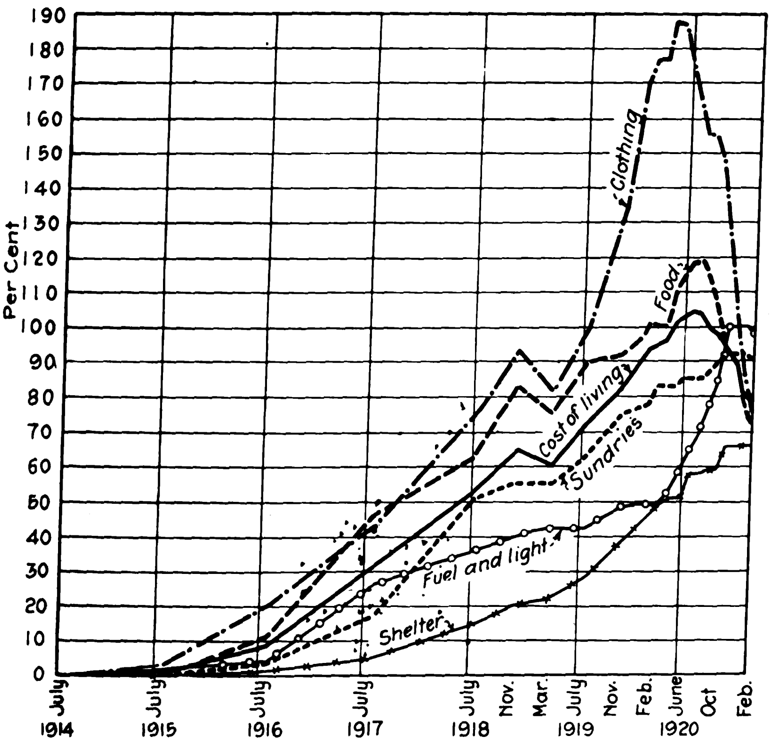
These figures, considered on year averages with 1912 as 100 per cent, showed the 1919 wholesale prices to have advanced to 203 per cent. The highest average price for any single month was in June, 1920, when the figure was 231 per cent of the 1912 prices. The average for 1921 up to Feb. 19, 1921, was 135 per cent of the 1912 figure. Year averages are given in the chart.

UNITED STATES BUREAU OF LABOR STATISTICS INDEX PRICE

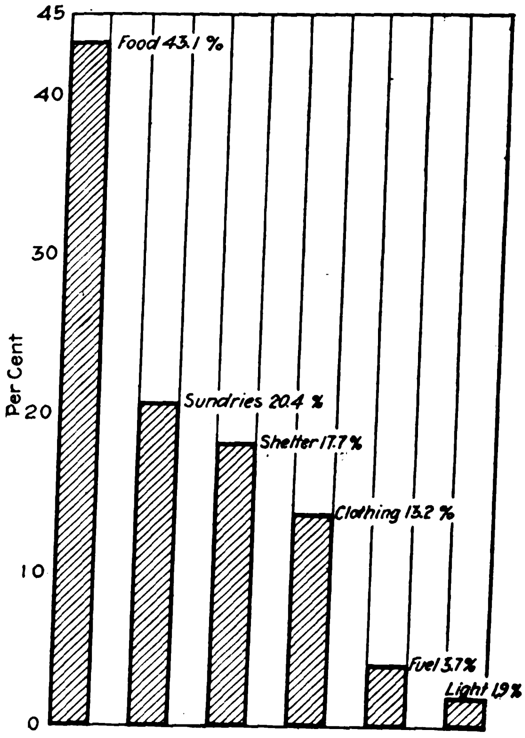
The wholesale price of more than 300 commodities are used as the basis of this index price, the quotations being principally at New York and Chicago. No attempt has been made to weigh the index number. Instead, it has been thought best simply to use a large number of representative articles, selected in such a manner as to make them to a large extent give the time value of price fluctuations in basic commodities.

NATIONAL INDUSTRIAL CONFERENCE BOARD

One of the important activities of this board is an investigation of living costs. One fundamental difference between its index number and those of Bradstreet, Dun, the Annalist and the United States Bureau of Labor Statistics is that the board bases its figures on retail prices rather than wholesale prices.



FLUCTUATIONS IN COST OF LIVING IN THE UNITED STATES AS REPORTED BY NATIONAL INDUSTRIAL CONFERENCE BOARD (PERCENTAGE ABOVE THAT IN 1914)



RELATIVE PERCENTAGES OF EXPENSE ITEMS COMPRISED IN THE AVERAGE FAMILY BUDGET

The relation of wholesale prices to retail prices is similar in many ways to the relation of retail prices to wage rates. There is a lag between the raising and lowering of wholesale prices and the reflection of this change in retail prices. Furthermore, retail prices are more a matter of personal selection than wholesale prices. This phase must be considered in any conclusion based on wholesale prices.

Another point of difference between the index figure of the National Industrial Conference Board and the other index figures mentioned, except Dun's, is that it represents a weighted average. The figure is made up of the retail prices for food, shelter, clothing, fuel and light, and sundries, weighted in the proportion which these have in the budget of an average family.

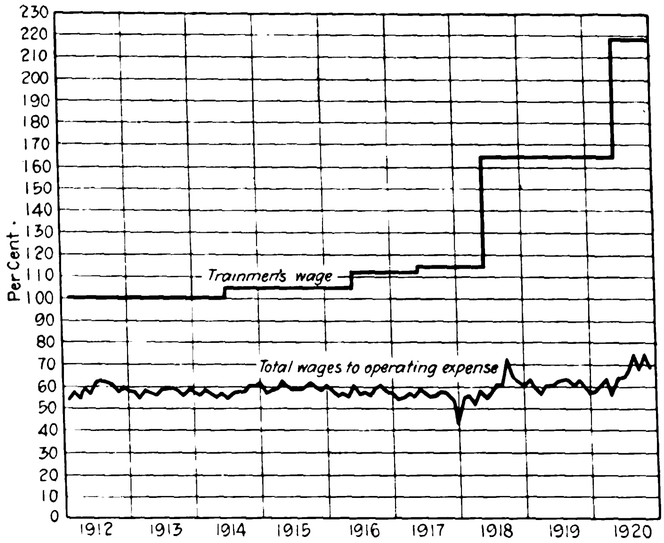
The food prices are obtained from the Statistical Bureau, United States Department of Labor. Clothing prices are based on data secured direct by the board from wide sources of information in various parts of the country. Prices for fuel, light, shelter and sundries are secured in the same manner as clothing prices. "Sundries" include carfare, doctors' fees, church contributions, organization dues, insurance, medicines, reading material, amusements, furniture, household supplies, candy, soft drinks and tobacco. The figure taken as the relative importance of these articles in the average budget is food 43.1 per cent, sundries 20.4 per cent, shelter 17.7 per cent, clothing 13.2 per cent, fuel 3.7 per cent, and light 1.9 per cent.

These figures and their total are shown graphically in the second chart. In this chart July, 1914, is taken as zero and the peak of retail prices will be found as having been reached in July, 1920, when the figure was 104.5 per cent above that of July, 1914. Since that time prices have been rapidly going down, and on the same basis as that just quoted the prices as of February, 1921, are 76.3 per cent.

The graph of costs of the National Industrial Conference Board shows that the principal reduction in living costs during recent months has been in food and clothing. Up to date the reduction in sundries, fuel and light has been small. The costs of these and of shelter are more involved than those of food and clothing, and considerable time will probably be required before they fully reflect the downward trend of prices. The public sentiment is also a large factor in the price of these items.

The highest prices for each of the various authorities were as follows: Bradstreet, February, 1920, 233.1 per cent; Dun, May, 1920, 213 per cent; the Annalist, June, 1920, 231 per cent; United States Bureau of Labor Statistics, May, 1920, 272 per cent, and National Industrial Conference Board, July, 1920, 104.5 per cent. As this last percentage represents the value above that of July, 1914, to be on a comparable basis with the others it should be read as 204.5 per cent.

Trade papers state that the prices of commodities in Great Britain and other foreign countries are declining in practically the same ratio as here and any view of the situation should consider conditions on a broader basis than just what is happening in this country.



ABOVE, AVERAGE TRAINMEN'S WAGE RATE FOR TYPICAL COMPANY COMPARED WITH THAT PREVAILING IN 1912. BELOW, RATIO OF TOTAL WAGES TO OPERATING EXPENSE

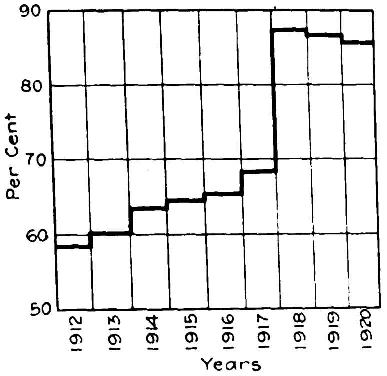
Only one conclusion can be reached from the charts shown. This is that wholesale prices have been off for some time and retail prices are rapidly going down and their trend is to a still lower level than the present. Several months are usually required before reductions in wholesale prices show up fully in retail prices. There is the natural tendency for the retail merchant to hold up his price at least until all the stock which he has purchased is sold. Again, his expenses for rent and wages, up to the present, have not been reduced in the same ratio as either wholesale prices or as the wages in industrial establishments. But as it is only natural to assume that the merchants' employees will receive a wage which will be in proportion to the other wages paid in the district, the cost of living in the near future will be in accord with the trend of wholesale prices.

WAGES AND UNEMPLOYMENT

In its January bulletin the United States Department of Labor declares that unemployment is at present assuming very serious proportions. In January, 1920, there were 9,402,000 employees in industry in the United States. This number for January, 1921, had decreased to 6,070,648, or 35 per cent. Other unemployed persons brought the total up to 37 per cent. The same bulletin reported general wage reductions in many cases of 20 to 33⅓ per cent. How far this will be reflected in wage rates for the electric railway industry is problematical, but if the cost of living is reduced in the same proportion as wages no personal hardship should result.

In 1912 the total wages paid to electric railway employees amounted to 50 or 55 per cent of all the operating expenses, excluding taxes. At present this figure has advanced to from 67 to 75 per cent. This increase in wages with the increased material cost coming at the same time are the two principal factors in making the adverse operating statements of practically all electric railways today.

Very few companies have received increases in fare rates that return a sufficiently large gross to overcome the increased operating costs. A company which may be classed as typical of the industry illustrates the points mentioned. The results of increased wages paid and the percentage of trainmen's wage rates are plotted in a fourth graph which shows about 72 to 75 per cent of total operating costs. The operating ratio for this company advanced successively year by year from 58.5 per cent in 1912 to 87.25 per cent in 1918. For 1920 this figure was 85.5 per cent. The margin between success and failure of a street railway as measured in operating ratio is in reality very small. Before the days of abnormal costs, generally speaking, a company having an operating ratio below 60 per cent, all expenses being included, was considered as making a good financial showing, while one with an operating ratio of 70 per cent or above was thought to be headed for a receivership. So it can be realized that a difference of 15 per cent spells failure or success.



OPERATING RATIO FOR TYPICAL COMPANY, SHOWING ADVERSE EFFECTS OF RISING COSTS

CONCLUSION

When one views all the evidence at hand the conclusion is that the cost of living will come down. Wages in all probability will be revised downward, but if the living cost is down, a corresponding reduction in wages ought not to be considered as serious by the employee.

As living costs tend to become stable on a lower price basis, general contentment will increase and society at large will in all probability be better satisfied with the revised conditions. When a dollar approaches nearer to the old purchasing basis, the increased wage which we have had will not be so necessary.

Work of Committee to Study Waste in Industry Well Under Way

A RECENT statement by L. W. Wallace, secretary Federated American Engineering Societies, indicates that the work of the committee of that society appointed to study the causes of waste in industry and means by which it can be eliminated is well under way. Ten representative industries have been selected for study, namely: Bituminous coal, building trade, transportation, men's ready-made clothing, printing, paper, metal trades, textiles, shoes and rubber. From three to ten plants of each elected industry are being visited by an experienced engineer under the direction of the committee. From the information obtained the committee hopes that it will be able to determine the extent, causes and remedy for unemployment.

Railroad Engineers Meet in Chicago

At Twenty-second Annual Convention of American Railway Engineering Association Held in Chicago March 15-17 Committee Reports Were Presented Covering Wide Range of Topics—Those of Particular Value and Interest to Electric Railway Engineers Are Abstracted in This Article

THE committee reports presented at the twenty-second annual meeting of the American Railway Engineering Association held at the Congress Hotel, Chicago, from March 15 to 17, contained a mass of material of value in the electric railway field. Abstracts of a number of these have been prepared from the point of view of the engineers interested in railway electrification or of the way engineer.

In discussing the report of the committee on electricity E. B. Katté, chairman of this committee, said in regard to the specifications given for insulated wires and cables that these were not written to supersede the signal specifications, but that it was the desire to have one specification that is applicable to all the various uses of electric insulated wire, and perhaps this may be brought about in the course of a few years. The committee which made the test in connection with the result and analysis was made up of representatives of four or five railroads, the United States Navy, the United States War Department and four or five manufacturers and after years of research they have finally agreed on a procedure which is fairly accurate. The railroad specifications for electric wires and cables and the specifications for incandescent lamps were approved for printing in the Manual as recommended practice.

The report on economies of railway location was presented and outlined by C. P. Howard, chairman. The text included under Appendix A and the conclusions reached were adopted for insertion in the Manual. The remainder of the report was received as information.

The work of the ballast committee for the past year was largely in the nature of a review of the instructions given in last year's report as information and was presented this year for adoption and inclusion in the Manual. Appendices B, C, D and E were adopted for printing in the Manual as recommended practice.

Nine subjects were assigned to the track committee this year and reports were presented on six. Recommendations adopted for printing in the Manual as recommended practice included spikes, both the $\frac{5}{8}$ in. and $\frac{9}{16}$ in.; specifications for switches, frogs, crossings and guard rails; a revision of tables of turnout leads and the plans of standard frogs.

An important development of the meeting was a letter sent by the chairman of the committee on rail, G. J. Ray (D., L. & W. R.R.), supplementing the committee's report. Mr. Ray, who was unable to be present, stated that no rails have yet been rolled to the specifications adopted in 1920 owing to the action of the manufacturers, who will not accept these specifications for rails of more than 110 lb. per yard and will only meet them for rails of less weight subject to certain modifications and an extra price. Mr. Ray believes that some of the claims of the manufacturers are reasonable, but on the other hand they have offered no constructive criticism of the specification. Their general attitude is that their own specifications and the 1915 specifications of the association are satisfactory, that the 1920 changes will prove costly without improving the quality of the rail and that railways are not sufficiently interested in securing better rails to pay the extra cost of production. No action was taken or requested, but the committee this year will consider whether to adopt two specifications (for different grades of rail) or to adopt a single specification which will not require extra cost but will be accompanied by a list of specific requirements and their probable cost, for the benefit of railways requiring rails of higher grade.

The report of the committee on wood preservation this year was full of information without any recommendations for the Manual. A part of the report that should appeal to all maintenance engineers is that given in Appendix A on service testing records. These records have been compiled from experimental track in most cases and cover three different treatments.

Electricity and the A. R. E. A.

TAKING up first the problems of power distribution as covered in the report of the committee on electricity, it may be noted that this committee, of which E. B. Katté is chairman, gave the results of its year's studies on such topics as electrolysis, water power specifications for insulated wires and cables, electrical interference, underground conduit construction, etc. As recommendations for new work, the committee suggested co-operation with the United States Geological Survey in connection with the "super-power survey" and also with the Water Power League of America and advocated study and report on overhead transmission and distribution line construction for railroad use, with a view of preparing plans and specifications for aërial construction, working with appropriate committees from the signal section and telegraph and telephone section of the American Railway Association.

In reporting on the protection of reinforced concrete from electrolysis, the committee stated the conclusion that the protection of a concrete structure with a waterproof shell is preferable, because this not only safeguards the reinforcing bars from moisture and later oxidation, but also protects the concrete surrounding the rods from abrasion and eventual exposure of the bars. The inside of the protecting shell should be waterproofed with pitch having a melting point about 200 deg. F. and of specified flexibility. Material of the required kind has been manufactured for twelve years or more, but has not generally been used for waterproofing but mainly as roofing material and in pavements. It is necessary not only to inclose the sides of the reinforced concrete structure with a waterproof shell but also to protect the top or any other portion that is exposed by means of a waterproof pitch.

The sub-committee on water power presented data regarding the Norfolk & Western Railway electrification, which was stated to have been decided upon primarily to secure greater facility of movement in a given time. It has also developed that the economy of electric operation is an important factor. Provision was made for interchange of emergency power between the railway steam plant located near Bluestone and the Appalachian Power Company's plant at Switchback. Charts were given in the report for typical fall and spring days, showing respectively for the two the following data: Total alternating current kilowatt-hours generated, 25-cycle, 353,500 and 249,800, and 60-cycle, 936 and 1,056; total alternating current kilowatts load for five minutes, 18,500 and 21,000; average power factor, 70 per cent and 65 per cent; load factor for five minutes, 79.6 per cent and 49.5 per cent; load factor for one hour, 85.6 per cent and 72.7 per cent. The high load factor in the first case is due to a large supply of emergency power to the power company.

The outstanding features of the Norfolk & Western electrification are the irregular spacing of trains and the ability of the generating equipment to supply large blocks of power on short notice. There have been instances where the power-house load has increased from 2,000 kw. to 25,000 kw. in less than five minutes.

Previous to electrification a standard tonnage train of 3,250 tons required three Mallet locomotives up a 2 per cent grade, making an average speed of 7½ m.p.h., while with electric locomotives the same train is handled by two engines at 14 m.p.h. Under steam conditions the round trip time of a crew out of Bluefield averaged twelve hours, while with electric operation it averages seven hours. Under steam conditions the time required to prepare a Mallet locomotive for a trip was from ten to twelve hours, while with electric locomotives forty minutes is allowed.

The report also gave comparative costs of steam and electric operation on the basis of 1,000,000 tractive miles, "tractive miles" being the product of the maximum tractive power in pounds and the total miles run. The respective amounts for steam and electricity for the several items of cost are as follows: Interest and depreciation $4.36, $12.16; repairs $7.64, $6.40; fuel of electric power at locomotives $13, $6.19; lubricants and wastes 16 cents, 5 cents; supplies 16 cents, 16 cents; engine-house expenses $2.18, 56 cents; water 51 cents, nothing; wages $1.89, 70 cents; total per 1,000,000 tractive miles $29.90, $26.20; saving by electric operation 12½ per cent.

With regard to fuel saving, the Norfolk & Western found that the modern Mallet compound superheating steam locomotive, equipped with all improvements except feedwater heaters, uses about 5.4 lb. of fuel per drawbar horsepower-hour, taking into account road conditions and allowing for standby losses, and assuming the engine to be in fairly good operating condition. With electric operation about 3.3 lb. of fuel is required. The annual saving for the present Elkhorn grade electrification is about 60,000 tons of fuel coal per year. The corresponding saving for the entire Norfolk & Western system would be nearly 1,000,000 tons per year. For the period January to June, 1920, the total mileage for an average of eight locomotives was 224,974, or 135 miles per locomotive per day. The kilowatt-hours at the power house per locomotive-mile averaged 160, and the watt-hours per trailing 1,000 ton-mile, 165.

After giving the Norfolk & Western data, the sub-committee concluded as follows:

1. That the use of 44,000-volt, single-phase, 25-cycle transmission of electric power with 11,000 volts single-phase on the trolley wire is practicable for electric train service for heavy grade and heavy tonnage.
2. That the average daily gross tonnage of freight eastbound over the electrified grade on the Norfolk & Western for 1918 was 47,500 tons as compared with 32,000 tons in 1912, an increase of about 50 per cent. The ultimate capacity based on the present installation is stated as 80 per cent over that of 1912.
3. That such a system of electrification will probably effect the saving of at least 12½ per cent of the total annual expense as compared with steam operation on a railway with similar characteristics.
4. That the introduction of electric locomotive with electric brakes (regenerative braking) has made possible higher speeds on heavy grades with greater safety and reliability under all climatic conditions.

In addition to the report of the committee on electricity there was a section of the report of the committee on economics of railway location which discussed electrical equipment. This is abstracted on pages 634 and 635. It relates to the economics of location as affected by the introduction of electric locomotives.

ELIMINATING ELECTRICAL INTERFERENCE

Another sub-committee, charged with the duty of reporting on recommended practice for eliminating, so far as practicable, interference with telephone, telegraph and signal lines caused by propulsion circuits and adjacent transmission lines, gave the results of a questionnaire. No conclusions were drawn, but the interference situation on a number of roads was summarized.

On the New Haven Railroad a "three-wire" system of distribution is used, with the terminals of 22,000-volt auto-transformers connected to the overhead wires, the center point of these transformers being grounded to the rail. One terminal of the transformers is connected to the trolley wires, the other to the feed wires. Communication circuits are cabled in the electrified zone. Under normal operating conditions telephone circuits are quiet, but on the occasion of a heavy short circuit on the traction system, so-called "acoustic shocks" have been experienced. To minimize these, drainage coils have been installed at various points along the line, these coils consisting of resistors or condensers in series with retardation coils. No trouble chargeable to induction has been experienced in connection with the automatic signals.

On the Philadelphia-Paoli electrification booster transformers were installed to prevent leakage of current from rail to ground, but were found of little value and practically all have been removed. All telephone and telegraph circuits are underground. Resonant shunts are used around relays on the telegraph circuits which provide a bypass for 25-cycle current. On the Philadelphia-Chestnut Hill electrification no booster transformers were used and no trouble has been experienced in telephone and telegraph circuits.

On the Long Island Railroad, which is a direct-current third-rail electrification, the transmission feeders are parallelled by telephone and telegraph circuits throughout almost their entire length. The open-wire telephone circuits are transposed at regular intervals, usually about eight transpositions per mile. The only inductive interference in the communication circuits is an occasional trouble due to unbalancing of power circuits, usually of short duration.

On the Norfolk & Western the company's telephone and telegraph circuits are open wire along the right-of-way, forming a close parallel to the contact and transmission circuits. Under normal conditions the inductive interference has been overcome to a very large extent on telegraph circuits by installing drainage shunts. This in conjunction with the special booster-transformer installation on traction circuits has cut down interference to a minimum; the only direct protection on railroad telephone circuits is transposition.

On the Great Northern three-phase electrification through the Cascade Tunnel the transmission line parallels the pole line supporting telegraph and signal line circuits, generally at a distance of from 80 to 90 ft. Interference with telegraph circuits, which was troublesome at first, has been overcome by the use of a twisted-pair steel armor communication cable.

On the Erie Railroad electrification south from Rochester, N. Y., interference occurs on a section 19 miles north of the transformer station located at Avon and 15 miles south thereof. Normally there is no disturbance from the transmission line, but induction from the 11,000-volt single-phase line is heavy on all single telegraph wires which come into this section. Under abnormal conditions the troubles are accentuated.

On the New York Central Railroad, West Shore branch, there is a parallel between the railroad's communication circuits and the 60,000-volt, three-phase, 60-cycle transmission line for about 115 miles, which normally causes no trouble. Under abnormal conditions severe surges are induced in railroad communication lines. On the Falls Road branch a short parallel causes trouble only due to contact. There has been some interference due to irregular power conditions on the parallel 20 miles long on the Walkill Valley branch, and a similar trouble on the Phoenix branch. In the Grand Central terminal electric zone 11,000-volt, three-phase, 25-cycle alternating-current power is transmitted to nine substations, partly on aërial lines and partly in cables. The telephone and telegraph lines are in cables in the same sections where the power line is cabled. In other sections the communication lines are part cable and part open wire on the side of the track opposite to the transmission line. There has been no electrical interference with communication or signal service.

On the Chicago, Lake Shore & South Bend Railway, extending from Kensington, Ill., to South Bend, Ind., the railway company's communication and signal circuits are carried on the same pole line as the transmission circuit without trouble. The Postal Telegraph & Cable Company's line parallels this road between West Blair Farm and Baileytown. Only under abnormal conditions due to short circuits and grounds are momentary troubles experienced on the telegraph circuits. The trouble is greatest when the railway company cuts out its 33,000-volt lines and carries the whole load on the system from the 6,600-volt, single-phase contact wire. Nothing has been done by the Postal company which eliminates these conditions.

SPECIFICATIONS FOR CONDUITS AND CABLES

The committee on electricity also presented railroad specifications for underground conduit construction for power cables, recommending that it be approved and printed in the Manual of Recommended Practice. The committee further recommended that the report on the National Electrical Safety Code, which outlined the present status of the code, be accepted as information and published in the *Proceedings* and that the committee be authorized to continue its co-operation with the United States Bureau of Standards. The committee further recommended that railroad specifications for wires and cables, which is presented, be approved and printed in the Manual as recommended practice. In connection with underground conduits, three new electrical definitions were suggested as follows: A *conduit* or *duct* is a unit length of pipe suitable for use in the construction of runways for electric light and cables. A *manhole* is an opening in a splicing chamber through which a man may enter. A *mandrel* is a tool for aligning and cleaning ducts.

The above abstract does not take up all of the detail items of the report, but refers particularly to those which will interest electric railway men.

Economics of Location as Affected by Introduction of Electric Locomotives

AN APPENDIX to the report of the committee on economics of railway location C. P. Howard, chairman, gave a summary of the advantages and disadvantages of the electric locomotive, beginning with the statement that railroad electrification, while most desirable from the point of view of the conservation of our fuel resources, is a matter that cannot be taken wholesale on account of the capital outlay required and the individuality of the problems of different railroads. At the same time, recent improvements in the steam locomotive have increased its efficiency practically 50 per cent, while its size and capacity have increased correspondingly.

The electric locomotive eliminates the turntable, cuts down standby losses, removes delay at water tanks and coaling stations, is more readily available than the steam locomotive for service, and its maintenance cost is lower. Its capacity increases with cold weather, and the simplicity of its control permits the crew more closely to observe the track and the signals. When properly designed the electric locomotive is easier riding than the steam locomotive and can have a more uniform distribution of weight with less nosing and track pounding, all of which tends to lower track maintenance. In addition the electric locomotive can concentrate large amounts of power under single control.

In steam locomotive operation each train has its own source of power which has no relation to the propulsion of the other trains on the line. In electric railway operation every train draws its power from one or more centrally located power houses. Steam trains are handled by locomotives only; electric trains may be propelled either by locomotives or motor cars.

ADVANTAGES OF ELECTRIC OPERATION

The committee summarized the actual and claimed advantages of electric operation in substance as follows:

The smoke nuisance is entirely eliminated. The entire weight of the locomotive can be concentrated on the drivers. Tractive effort can be increased without decrease in speed. Train weights from 18 to 25 per cent greater than is possible with steam locomotives can be hauled. The electric locomotive does not need to be taken out of service for cleaning, coaling, watering, etc., at terminals. Fuel consumption is low, but in comparison with steam locomotives all elements of power cost should be included. Unit cost of electric operation decreases with increase in volume of traffic.

The committee generally listed the handicaps to which the electric locomotive is subject somewhat as follows:

Electric equipment is costly, and it must bring about a great reduction in operating cost to justify its use. The electric locomotive is a transforming apparatus and is subject to overload, which the steam locomotive is not. Electric operation involves extra hazards to employees and others. An electrified system is liable to train delays inherent to the system, both due to equipment failures and power transmission line and power house failures. (The committee noted, however, that these delays are rare.) With electric traction, alternating-current track-circuit apparatus must be used for signals. Normal traffic cannot be exceeded for long periods unless the system has been designed to take care of maximum traffic. The power system load factor is apt to be low unless other load is carried. Electric locomotives are limited in their field of operation strictly to electrified track and so do not have the element of interchangeability possessed by steam locomotives.

As to comparative efficiency of the electric and steam locomotives in the matter of failures, the committee stated that the electric locomotive seems to hold its own. However, the steam locomotive has recently become a more formidable competitor due to the development of improvements, particularly the various outside valve gears, the superheater, the brick arch and the automatic stoker. It would appear that the ton-miles moved by 6½ lb. of coal in a steam locomotive are approximately equal to what can be moved by 1 kw.-hr. delivered from a power station, varying of course with the quality of the coal. In most cases the profits from electrification must be realized indirectly rather than directly, for example, from increased track capacity and the like. Steam railroads will generally consider electrification favorably when the reduction in operating expenses will pay the interest on the necessary investment; also when the track capacity must imperatively be increased, and this increase can only be supplied by a large additional expenditure or by electrification.

As to location economics, the introduction of electric traction will require changes in the economic values heretofore assumed under the classified heads of "distance," "rise and fall," "curvature" and "rate of grade." These topics were discussed in the report in some detail. The committee concluded that, taking into consideration heavy fixed charges of investment, no general conclusion can be given at this time as to the relative economies of electric and steam operation. Each case must be considered by itself, with due regard to all elements of cost and expense, both special and general, as well as operating conditions and the public comfort and safety.

Committee Reports on Way Matters

THE following abstracts cover the reports on track and allied topics. For convenient reference they have been arranged under the committee titles:

Committee on Ballast: The committee presented revisions of subject matter in the Manual; intruction for ballasting on operated line; specifications for stone ballast material and washed gravel ballast, recommended designs for standard ballast tamping bar, pick and fork. A design of standard ballast shovel was submitted for study.

Committee on Stresses in Track: A progress report was made stating that important information on stresses developed in curved track is in process of preparation for future report.

Committee on Rail: The committee presented its customary report on rail failure statistics. Continued effort has been devoted to the search for the causes of transverse fissures. The investigation has indicated that the trouble may ultimately be traced to shrinkage cracks which occur during cooling, after passing the hot saws. A critical study is being conducted to determine the influence of mill practice on the properties of rails. The committee submitted new rail record forms to replace those now in the Manual. Some tests by Dr. Dudley show that there is a high residual ductility in rails even after five years of severe service. It is stated that tests for determining intensity of pressure on rail heads show that the pressure is least where the wheels are worn slightly concave.

Committee on Economics of Railway Labor: This committee stated that very little is being done by the railroads in exercise of care in selection of maintenance labor. There should be immediate action looking toward improvement of the labor situation and organized effort must be put forth to increase labor efficiency through education and training. The average age of roadmasters and track supervisors is forty-five years. Fifty per cent of the roadmasters and supervisors have had some engineering training. They each have charge, on an average, of 111 maintrack miles and 75 sidetrack miles. Ninety per cent of the common labor is composed of native white men. The average length of track section per foreman is 6.7 miles maintrack and 3.1 miles sidetrack.

Committee on Standardization: A new and special committee has been appointed to assist in the promotion of the use of the association standards. The committee is to review specifications heretofore adopted and suggest subjects which need joint study by the several standing committees. The committee is also to suggest items of railway material which should be covered by standard specifications.

Committee on Uniform General Contract Forms: A number of revisions of the contract form now in the Manual were proposed. A tentative form of license for wires, pipes, drains and conduits on railroad property was submitted for criticism. A form of lease agreement for industrial sites was recommended for adoption.

Committee on Signs, Fences and Crossings: A number of changes were recommended in the specifications for standard right-of-way fences. Designs were submitted and recommended for adoption, covering a number of signs for mileposts, section sign, bridge numbers, etc. A tentative specification for highway grade crossings was submitted and a summary of the requirements and practice in the various states and in Canada was presented. There was also an extended discussion of crossing gates, warning signals, wigwags and bells. A matter of particular interest is the revision of the statement of laws relating to separation of grades at highway crossings. Electric railways are subject to these laws and this information forms a valuable record of the variations in the laws in apportioning costs and methods of procedure. The bibliography on elimination of grade crossings should be of great assistance to engineers having occasion to gather information on the subject.

Committee on Ties: A number of changes in definitions were recommended. None of the railroads use the specifications for cross-ties and switch-ties now in the Manual. New specifications have been prepared and submitted for adoption in lieu of those now in the Manual. It is recommended that test sections for obtaining records of tie life be put in "out of face" and that not less than 100 ties of each kind be installed.

Descriptions of methods of inspection and the essentials for keeping adequate records were presented as information, and there was an extended discussion of the relative merits of various sizes of ties.

The subject of substitute ties received a good share of attention, and the committee called attention to the desirability of extended tests, believing that the engineering departments should take a more active interest in the development of substitute ties. Records of the various ties now under test were brought up to date. The committee called attention to its special report on the "Relative Merits of Metal versus Wooden Ties." This report was abstracted briefly in the ELECTRIC RAILWAY JOURNAL last year.

Committee on Iron and Steel Structures: This committee presented rules and unit stresses for rating existing bridges for approval. These rules have been under discussion for several years. The formula for impact is of particular interest to bridge engineers. Also, the principles applying to membrane waterproofing of bridge floors were discussed and submitted for approval. Particular attention must be given to drainage, reinforcement flashing and protection.

Committee on Water Service: The study of regulations relating to supply of drinking water on trains or premises of railroads brings out the fact that federal and state authorities are taking an increased interest in matters pertaining to drinking water supplies. The sanitary handling of such water is said to be in need of careful consideration and should be considered as important as any question of safety appliances. The handling of water to and in containers is a source of contamination. The Bureau of Public Health Service, United States Treasury Department, has requested that water containers be so constructed that ice does not come in contact with the water. The committee submitted specifications for substructures of wood and steel for water tanks for adoption and insertion in the Manual.

Committee on Wood Preservation: A report is made on Florida pine ties of the Public Service Railway which were treated with water-gas tar, fuel-cell treatment and installed in 1911. None has been removed to date and ties are in good condition. The availability of sodium fluoride as a preservative was discussed and the "toxicity" of the material was stated to be twice that of zinc chloride. More experimental installations are desirable.

The attacks of marine borers on piling is more extensive and more severe than formerly. Limnoria and toredo are particularly active. Creosote treatment is quite effective as a protection in some places but in others it is often inadequate and mechanical protection must also be applied. Creosote has so far not been found to stop attacks of limnoria. Various methods of mechanical protection, such as vitrified pipe, cast-iron pipe and concrete casings were described and illustrated in the report. Studding the piles with nails has been found to give protection against the toredo. Bark left in place offers protection for some time.

Committee on Wooden Bridges and Trestles: The committee reported that 16-in. stringers will be available for a long time to come. It is a depth largely used. Piles for trestles should have at least 14-in. butts and be driven to be safe for a load of 15 tons plus impact. The recommended sizes for stringers, caps, posts and sills are given covering Cooper's E45, E55 and E65 loading. Ties should be 8 in. x 8 in. x 10 ft. not dapped, and spaced 12 in. centers. Guard timbers should be 4 in. x 8 in.

Specifications for classification and grading rules for timber and lumber used in maintenance-of-way work were recommended for adoption. A table of allowable working stresses for structural timbers was presented. This covers a large variety of timber species.

Committee on Masonry: Conclusions were presented by this committee covering use of concrete for sea water work. Particular care must be given to designs to avoid sharp corners, offsets or pockets tending to obstruct flow of waves and floating objects. A very dense, impervious aggregate is desirable and the component parts must be carefully selected. Especial attention should be given to design when reinforcement is used. No steel should be nearer than 3 in. to any surface and not less than 4 in. from any two adjacent surfaces.

Committee on Economics of Railway Location: A number of interesting diagrams, tables and conclusions were presented by this committee for adoption, covering the resistance of trains running between 35 and 75 m.p.h.

Committee on Shops and Locomotive Terminals: An extended progress report on design of car shops was presented. A variety of designs of existing shops were illustrated, with a number of tentative conclusions covering such matters as track centers, space allowed per car, supply tracks, clearances, headroom, doors, paint shops, lighting and heating.

Committee on Track: Under "Revision of Manual" some slight changes were recommended by the committee in the design of cut track spikes. The design originally adopted did not show certain details correctly. Designs for $\frac{5}{8}$-in. and $\frac{9}{16}$-in. spikes were presented for adoption. It is reported that these spikes can be made in automatic machines. There had been some trouble about this with the earlier design.

Specifications for switches, frogs, crossings and guard rails were presented for adoption. There were many points in these specifications which are similar to those adopted by the American Electric Railway Engineering Association covering plain bolted special trackwork and materials for manufacture of special trackwork. Data for laying out bolted rigid frogs, railbound manganese-steel frogs and solid manganese frogs are presented and recommended for inclusion in the Manual. Standard dimensions for solid manganese frogs, tables of practical and theoretical turnout leads were also included in the recommendation. An elaborate progress report was made on gages and flangeways for curved crossings. Tentative specifications covering tie plates were presented for criticism.

Committee on Roadway: Subsidence and shrinkage of embankments were reported on extensively by this committee. Some subsidence occurs under an embankment except those built on rock. It is due to displacement or compression of earth under embankment. It must always be expected in swamps, marsh, bogs and any land where there is standing water. Shrinkage is composed for four elements: Wastage due to loss in haul; due to wind erosion; water erosion, and compression. The latter is by far the largest factor. The customary allowance of 10 per cent of shrinkage of earth is very nearly correct. Swell is often found in rock or shale. This may be as great as 60 per cent. No rule for swell can be given for general use. Specifications for corrugated metal culverts were presented for study. These culverts can be used to advantage in numerous instances. A number of conclusions on drainage of wet cuts were presented together with a number of illustrations of methods which are recommended for providing such drainage.

Committee on Economics of Railway Operation: The report of this committee is too elaborate to admit of an abstract which would do it justice. Of interest in connection with "human engineering" is a report on methods for increasing efficiency of employees by furnishing them with reports and comparisons. Methods for increasing traffic capacity of a railway were the subject of valuable studies presented as appendices to the report. The effects of speed on costs of track maintenance and on cost of transportation and cost of maintenance of equipment are subjects treated in Appendix C. It is evident from these reports that speed costs money and requires a better standard of maintenance. Quite definite increases in expense may be expected; operating speeds increase in way department accounts and these run through all of the maintenance accounts from superintendence down.

Committee on Rules and Organization: A manual of instructions for the guidance of engineering parties and a manual of rules for the guidance of employees of the maintenance-of-way department were recommended for adoption. These are to replace all matter on rules and organization now in the Manual. The instructions for engineering parties are very thorough and should be in the hands of all railway engineers. The manual of rules for way employees is prepared with the view of covering matters broadly so that they may be used as a basis for the rules of any way department.

Under the head of "Science of Organization" the committee presented the fundamentals of organization and outlined the two general types of organization now in vogue, namely, the line type and the staff type.

Diagrams or charts of these are given and the charts show the workings of the two divisions of the line type as used by railroads, *i.e.*, departmental and divisional.

Double Circuit Breaker Safety Switch

THE Cutter Company, Philadelphia, Pa., has just placed upon the market a new type of inclosed circuit breaker which serves not only for protection from overload but also acts in place of a double-pole switch. The new device, which goes under the name of "U-re-lite," consists essentially of two circuit breakers, one on each side of the line, inclosed in a steel box. The switch is operated by first turning a handle on the outside of the box to the left, which closes one of the single-pole circuit breakers. Turning the handle to the right closes the other circuit breaker. It is so designed that after one breaker is closed it is free to respond and instantly open the circuit, should the other one be closed against an overload or short circuit. It is this construction which makes the knife switch unnecessary. After the circuit is established, when actuated by overload or when tripped by hand by means of a knob, both sides of the circuit are opened simultaneously. This type of switch is manufactured in ampere ratings of from 2 to 60 amp., for use on either alternating or direct current of voltages of 250 or less.

Oklahoma Utilities Hold Convention

Utility Men of Oklahoma Optimistic—John W. Shartel, Oklahoma Railway, Says that Improperly Regulated Utilities Cannot Be Successfully Financed Nor Can They Give Adequate Service

THE most successful convention in the history of the Oklahoma Utilities Association came to a close on March 10 after a three days' session at Oklahoma City, Okla. It was attended by more than 300 utility operators and others interested. A spirit of optimism pervaded the convention in spite of the difficulties so many members are having in financing new properties and improvements. Nevertheless, the spirit of Western hospitality and enthusiasm prevailed. The public officials who addressed the meeting included Gov. J. B. A. Robertson of Oklahoma; Campbell Russell, chairman of the Oklahoma Corporation Commission; Paul Walker, referee of the State Supreme Court and former attorney of the Corporation Commission, and H. W. Hubenthal, chief telephone engineer of the commission. Paul P. Hayes, member of the Public Service Commission of Indiana, made the principal address at the banquet on Monday night, March 9. Other speakers were John W. Shartel, vice-president and general manager of the Oklahoma Railway; J. W. Ingison, Ingison Hydro-Electric Power Company, Minneapolis, Minn.; H. B. Wright, H. B. Wright Investment Company, Kansas City; C. J. Griffith, Little Rock Railway & Light Company, Little Rock, Ark.; William B. Way, secretary of the National Gas Association of America; James P. Barnes, Louisville Railway, and C. L. Mitchell, Minnesota Electric Light & Power Company, Cushing, Okla.

Officers of the association elected for the ensuing year are John W. Shartel, Oklahoma City, president; C. E. Devin, Apache, first vice-president; F. A. Willard, McAlester, second vice-president; William Mee, Oklahoma City, treasurer, and H. A. Lane, Oklahoma City, manager. An executive board comprising fifteen members was also chosen.

In an address, in response to a speech by Governor Robertson, Mr. Shartel declared that the utilities do not object to regulation, but it should be intelligently administered. He recommended a revision of the whole system of dealing with the utility question and predicted that with a reorganized electric system and adequate facilities the state would have an increased population of 750,000 within five years. Unless the public wishes to furnish the capital to finance these utilities, private capital must have its recompense. Private capital will not come in unless it has a promise of absolutely fair treatment. The great difficulty with the public utility situation is that the people have not yet grasped these fundamentals.

Headway Recorder Supplies Traffic Data

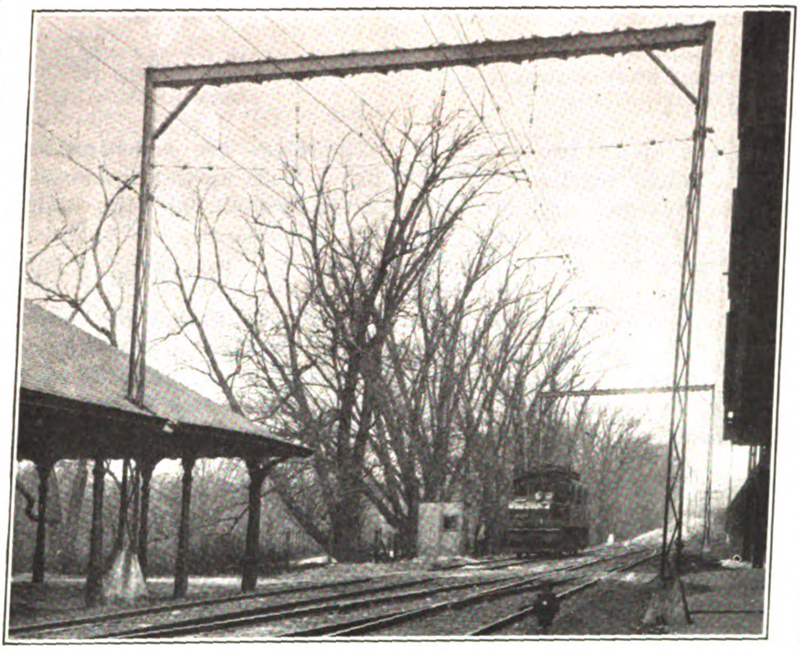
THE Youngstown Municipal Railway has installed a Nachod type R-2 headway recorder on one of its lines for the purpose of studying traffic and schedule conditions and securing data on interruptions to service. This device can be used either on single-track or double-track lines, for as a car passes under the trolley contractor, an impression is made on the chart which shows the time the car passed and also its direction. It is the plan to transfer the recorder from one line to another so that the same study may be made on any line on the system.

Branch of St. Paul R. R. Electrified

Freight on Old Chicago-Evanston Branch of St. Paul Railroad Now Handled Electrically by the Northwestern Elevated Railroad —The Overhead Construction of This Electrification Is of Interesting but Special Design

THE Northwestern Elevated Railroad, Chicago, operates between Evanston and Wilson Avenue, Chicago, on right-of-way leased from the Chicago, Milwaukee & St. Paul Railway. This branch of the St. Paul was originally the Chicago & Lake Superior Railroad, but it was never extended any farther north than Evanston. Passenger service was discontinued on it some years ago, but the steam road has retained a track adjacent to the electrically operated elevated line for the purpose of giving freight service to a number of industries located along the right-of-way, consisting mainly of coal and building material dealers. When it became necessary to elevate the tracks of the Northwestern north of Wilson Avenue, in accord with a city ordinance, the work of necessity included the St. Paul Railroad and the industry spur tracks. With this freight service elevated, the presence of noisy and smoky steam locomotives in the high grade residential section was more than ever undesirable. Consequently, when a new contract was entered into between the elevated and the St. Paul Railroad, which provided facilities for extending service north from Wilson Avenue to the city limits at Howard Street, one of the terms written into the contract by the steam railroad was that this freight service should be handled by the Northwestern Elevated Railroad for the St. Paul at cost. Accordingly, the former company has electrified the track used in this freight service, and this track will now be used for freight service during the non-rush hours. During the rush hours the tracks will be used for elevated passenger trains only, thus enabling the operation of both local and express trains from the downtown loop to Howard Street, the city limits, in both directions.

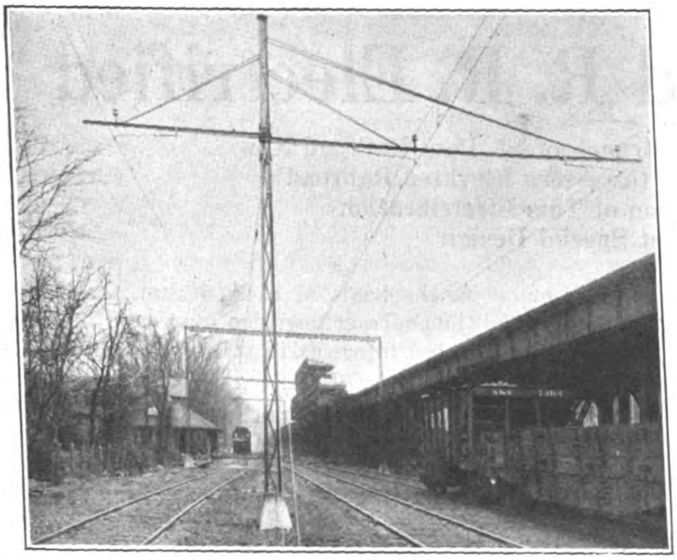
In handling this freight service for the steam road, the elevated company simply acts as the agent of the St. Paul, setting empty cars in the siding and hauling away loaded cars, or vice versa, and having nothing to do with the accounting, billing or any of the details aside from actual transportation. A monthly settlement is made on the basis of a fixed sum per loaded car moved, and the contract provides for the adjustment of this sum at stated intervals to take care of fluctuating costs.



CATENARY OVERHEAD ON CHICAGO ELECTRIFICATION OF ST. PAUL R.R. BRANCH, SHOWING BRIDGE CONSTRUCTION WHERE GUYING WAS IMPOSSIBLE—APPROACH TO ELEVATED TRACK IN BACKGROUND

The steam road leaves the cars in a receiving yard located between Irving Park Avenue and Montrose Avenue and having a capacity for thirty loaded and thirty empty cars. This yard comprises three tracks, one of which is the main line and one the storage track for loaded cars and the other the storage track for empty cars. About fifty cars a day are handled. Cars are taken from and delivered to this yard by the two electric locomotives purchased by the Northwestern for the purpose. Immediately north of the yard the track ascends a 2 per cent grade onto the elevated structure. This freight track then extends north to Howard Avenue. From there to Evanston freight trains will be hauled over the two tracks of the elevated line. One of the most interesting parts of this electrification work was the construction of the overhead. At the present time, the elevated cars are operated between Wilson Avenue and Howard Avenue by means of the overhead trolley, but it is expected that this will be replaced with third rail, as used on the remainder of the system, at an early date. However, on account of clearances, it is impractical to employ a third rail on the track used in the freight service, so that it has been necessary to put up a permanent overhead construction for one track for the distance of 5 miles from Irving Park Boulevard to Howard Avenue. When this track is used during the rush hours in the passenger service it will be necessary to use the overhead trolley. As the cars operating on the Northwestern line must be equipped with trolley poles in order to operate north of Howard Avenue anyway, this will not bring in any new complication.

The overhead construction employed is of the catenary type supported on 6-in. top 35-ft. and 50-ft. Bates expanded steel poles and steel mast arms. The poles set in the ground are all set in concrete 5 ft. deep and spaced for 150-ft. spans. The mast arms sup-



STEEL POLE SUPPORTING OVERHEAD OVER THREE TRACKS, SHOWING CONCRETE FOOTING AND MAST-ARM CONSTRUCTION

METHOD OF DEAD-ENDING HEAVY OVERHEAD—END POLES ARE GUYED TO 2-TON CONCRETE BLOCK ANCHORS BURIED IN THE GROUND

porting the overhead are made up of two pieces of 2¼ x 2¼ x ¼-in. angle irons bolted together back to back with the pole and truss pins and spacing blocks in between the two angles. The messenger supporting the No. 0000 grooved trolley wire is of 7/16-in. Siemens-Martin steel cable. In the storage yard at Irving Park Boulevard it was necessary, on account of lack of space of guy poles adjacent to the "L" structure, to support the overhead over the three tracks on a single line of poles, necessitating the use of 24-ft. mast arms on one side. The overhead equipment was of Westinghouse and Drew manufacture.

Just north of the yard, on account of the long cross-span necessary to provide for three tracks, the heavy weight of the overhead special work at that point, and short guy space, a bridge construction between Bates steel poles was employed. This is shown in an accompanying picture. Over the incline leading up to the elevated track a double trolley was installed in order to provide more current-carrying capacity, for the two locomotives are sometimes coupled together to pull heavy loads up this grade. In this case they may pull as high as 2,000 amp. each for a period of five or six minutes.

METHODS OF SETTING POLES

Several different methods of setting the steel poles was necessary in providing for the different conditions existing along the elevated construction. On the permanent elevation work, the poles were set on the top of the retaining wall or on the concrete curbing on slab construction, and in such setting a special footing was provided for the pole by bolting a piece of channel iron to either side of the pole, as shown in the accompanying drawing. Additional strength at the base of the poles was gained by filling with concrete up even with this top base support. The various methods of setting poles are shown in the accompanying drawing.

An interesting special case of pole setting was that used along the approach to the elevated structure and

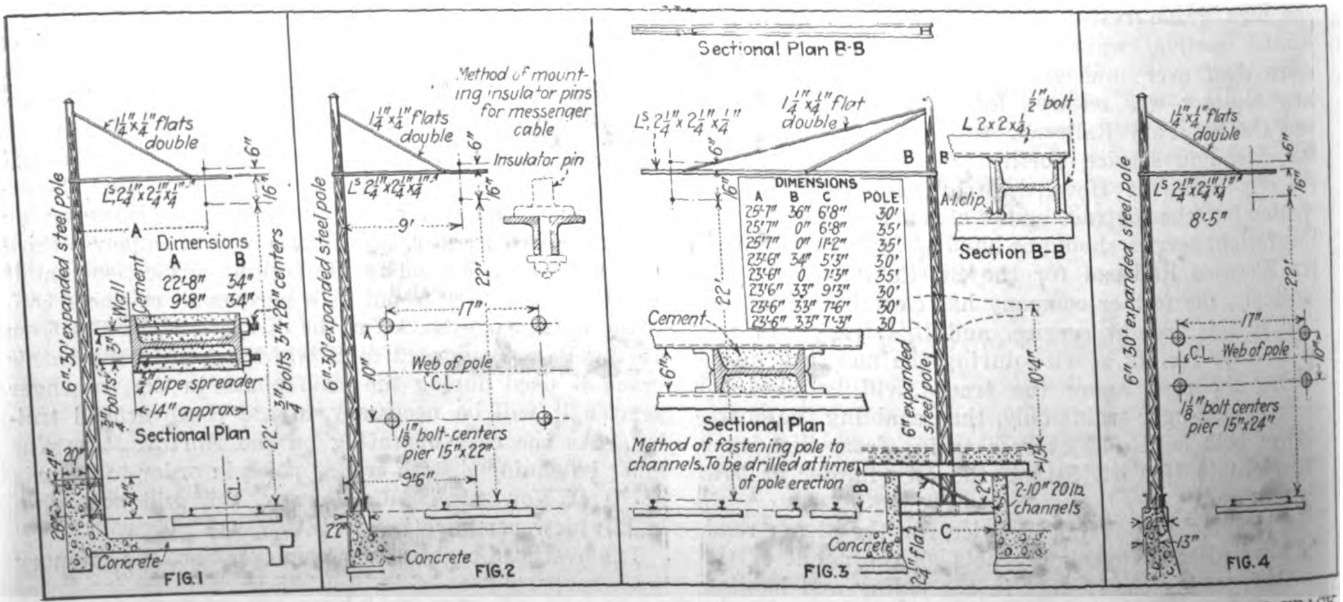

1¼"x¼" flats double
L⁵ 2¼"x2¼"x¼"
6"
16"
A
Dimensions
A B
22'-8" 34"
9'-8" 34"
Wall
Cement
3"
¾" bolts
¾" pipe spreader
←14" approx.→
Sectional Plan
¾" bolts 3½"x26" centers
22'
6"-30' expanded steel pole
20"
4"
34"
26"
C.L.
Concrete
FIG. 1
Method of mounting insulator pins for messenger cable
1¼"x¼" flats double
6"
Insulator pin
L⁵ 2¼"x2¼"x¼"
16"
9'
22'
17"
10"
Web of pole
C.L.
1⅛" bolt-centers
pier 15"x22"
9'6"
6"-30' expanded steel pole
22"
Concrete
FIG. 2
Sectional Plan B-B
L⁵ 2¼"x2¼"x¼"
1¼"x¼" flat double
6"
16"
B
B
½" bolt
L 2x2x¼
A-1 clip
Section B-B
DIMENSIONS
A B C POLE
25'-7" 36" 6'8" 30'
25'7" 0" 6'-8" 35'
25'7" 0" 11'-2" 35'
23'-6" 34" 5'3" 30'
23'-6" 0 7'3" 35'
23'6" 33" 9'3" 30'
23'-6" 33" 7'-6" 30'
23'-6" 33" 7'-3" 30
22'
Cement
6"
Sectional Plan
Method of fastening pole to channels. To be drilled at time of pole erection
6" expanded steel pole
10'4"
1'3"
2¼"
B
2-10" 20 lb. channels
C
Concrete
2¼" flat
FIG. 3
6". 30' expanded steel pole
1¼"x¼" flats double
6"
L⁵ 2¼"x2¼"x¼"
16"
8'-5"
22'
17"
C.L. Web of pole
10"
1⅛" bolt centers
pier 15"x24"
24"
13"
FIG. 4

FIG. 1—METHOD OF SETTING STEEL TROLLEY POLES ON BRIDGES WHERE SIDE GIRDER EXTENDS ABOVE TRACK LEVEL. FIG. 2—METHOD OF MOUNTING POLES ON CURBING WHERE THERE IS A SLAB CONSTRUCTION. FIG. 3.—METHOD OF SETTING POLES IN CENTER OF STATION PLATFORM CONSTRUCTION. FIG. 4—METHOD OF SETTING POLE ON TOP OF CONCRETE RETAINING WALL FOR FILLED-IN EARTH ELEVATION

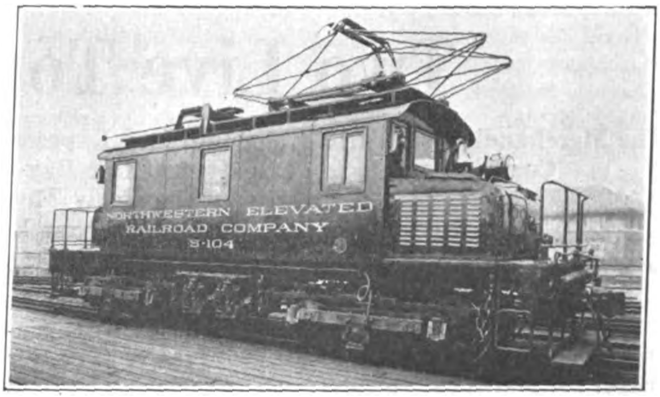
at certain other points. Here the poles were set in the ground adjacent to the concrete retaining wall, making necessary a 50-ft. pole. These 50-ft. poles were made up of three standard 25-ft. steel poles, two of which form the base, with the third as the upper part and supported by fastening to the top of the bottom sections. The two bottom poles were erected and riveted together side to side, with six rivets. The upper section was then held in place by means of two plates overlapping the top and bottom poles and riveted thereto with six rivets in each plate.

ELECTRIC LOCOMOTIVES USED

For the sake of standardization, the two 50-ton Westinghouse 600-volt direct-current locomotives purchased by the Northwestern for handling this freight service were equipped with the same size wheels, the same motors and the same gear ratio as that used on the latest type of steel cars purchased for passenger service on the elevated lines. Each locomotive is equipped with four Westinghouse 567-R-1 motors. The wheels are 34 in. in diameter and the gear ratio 17 to 60.

These motors are of the field control type, developing 165 hp. each on one-hour rating. The locomotives are arranged for multiple-unit control so that they may be coupled together for pulling a train as long as twenty-five cars up the 2 per cent grade approaching the elevated structure. They are equipped with Economy watt-hour meters. There are three running points provided in the control, providing three operating speeds. These are derived by connecting all four motors in series, two motors in series and two in parallel, and four motors in parallel. The motorman notches up the throttle-type controller through sixteen points to the full series position, then brings the controller back and throws a change-over lever which provides for the parallel running points.

The brake equipment is of the Westinghouse 14 E. L. locomotive automatic type with air supplied by a Westinghouse Type D-3-F 35-ft. compressor designed for continuous duty. All equipment is mounted inside the cab. The trucks are of Baldwin Locomotive Company manufacture.



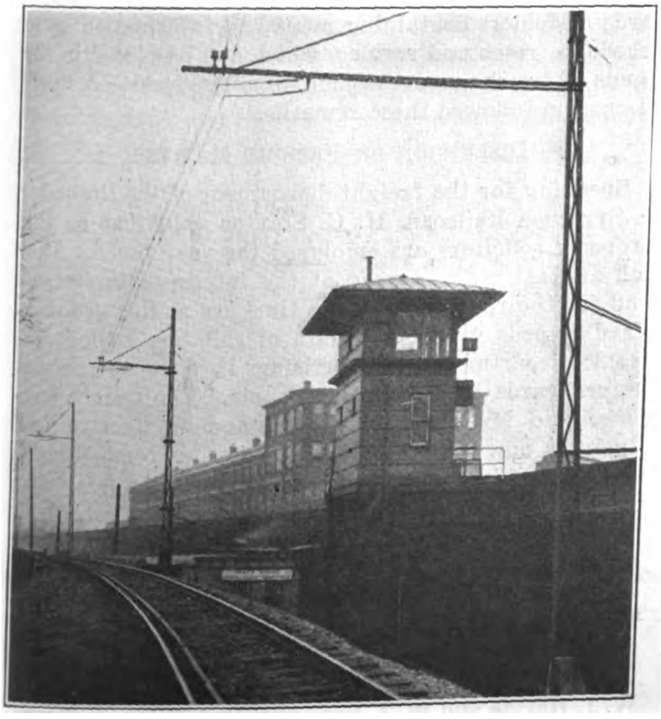
ONE OF THE ELECTRIC LOCOMOTIVES USED BY NORTHWESTERN "L" TO HANDLE ST. PAUL R.R. FREIGHT

Pneumatic Wrenches Used for Tightening Track Bolts

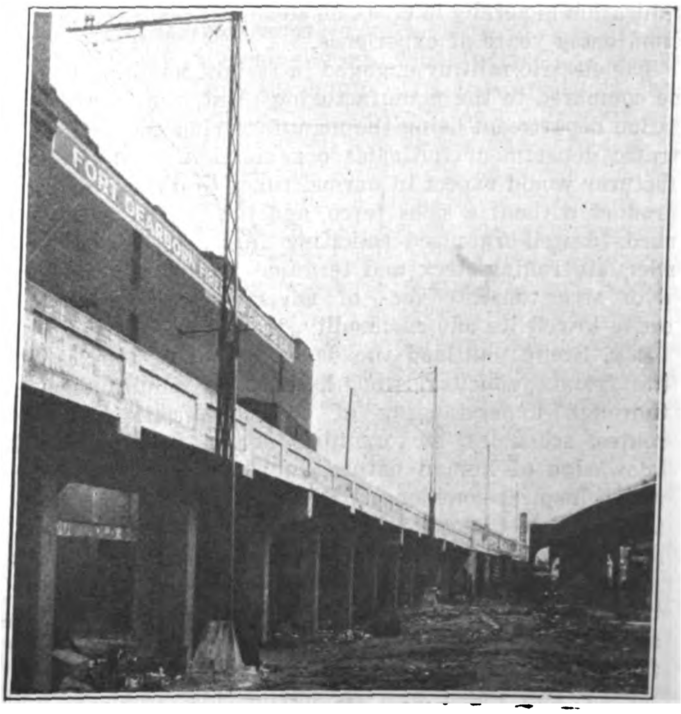
IN SEVERAL recent operations of laying rail, the Lehigh Valley Railroad has used pneumatic wrenches for running up and tightening the track bolts. As this was its first attempt the organization worked out for the operation was somewhat of a makeshift character.

In one instance an air compressor was pushed along by hand and four pneumatic wrenches were attached to it by air hose. This arrangement covered two joints at one time. In another case, a motor car was attached to the compressor and but two wrenches were operated. The time for running up a joint and moving to the next averaged about thirty seconds per joint.

The men released by the machine were placed at work on the old rail preparing it for loading.



DOUBLE TROLLEY WAS INSTALLED OVER THE GRADE UP TO THE ELEVATED TRACK—SIMPLE SINGLE-TRACK POLE AND MAST-ARM CONSTRUCTION



METHOD OF ERECTING OVERHEAD POLES, MADE UP OF THREE LENGTHS RIVETED TOGETHER, BESIDE THE ELEVATED STRUCTURE

Two Live Topics Discussed

The Merchandising of Trolley Freight and Express Service and the Latest Facts Regarding the One-Man Car Were Subjects of the Recent One-Day Conference of the New York Electric Railway Association's Quarterly Meeting, Which Was Held at the Biltmore in New York City on March 18

THE twenty-fourth quarterly meeting of the New York Electric Railway Association was held in New York City on March 18. A part of the conference was the subject of an article in the issue of this paper for March 26, page 601. There the paper by L. R. Brown, New York State Railways, was abstracted and the discussion which it provoked was summarized. Below are reports of the informal discussion of the freight and express business of electric railways and of the safety car.

Freight Department Has Great Opportunity to Help Increase Net Income

THE discussion on electric freight business was opened by T. H. Stoffel, railway department Westinghouse Electric & Manufacturing Company. He said that railway men do not generally realize the importance of intelligent and well-directed freight solicitation. While the securing of freight tonnage is properly the principal function of the traffic department, often this department is handicapped and subordinated to the operating or transportation department. It is relegated to the position of a clerical division, with activities largely confined to compiling tariffs, quoting rates, adjusting claims, etc. The head of the traffic department is entitled to rank with the chief transportation officer and should be vested with complete responsibility for the results of freight operation. He should have a voice in the arrangement of freight schedules, distribution of equipment, etc., and should enjoy the full co-operation of the transportation department. This is a plan of organization generally in effect on steam railroads, evolved from many years of experience.

The electric railway engaged in freight handling may be compared to the manufacturing plant, the transportation department being the manufacturing end and the traffic department the sales organization. No manufacturer would expect in normal times to dispose of his product without a sales force, and the electric railway needs a well-organized soliciting force, backed up by adequate rolling-stock and terminal facilities, together with strict maintenance of advertised schedules, in order to sell its one commodity, transportation service.

Mr. Stoffel outlined the desirable characteristics in the freight solicitor, who, he said, in addition to a thorough understanding of the classification, rates, routes, schedules, etc., requires considerable tact and knowledge of human nature, coupled with personality which inspires confidence. He will be called upon from time to time to solve many knotty transportation problems, smoothe over complaints, inspect damaged shipment, arrange payment of claims, and generally satisfy the needs of patrons. He must also educate shippers as to matters in connection with forwarding goods. The freight solicitor who can gain and hold a shipper's confidence and assist him in solving his problems will receive preference in the routing of shipments.

As the purchaser or consignee, as a general rule, pays the freight and controls the routing, Mr. Stoffel said that it is very necessary that he be induced to include a desired routing on his order for goods. This requires personal effort, as the practice of securing routing requests on blanks provided for the purpose by the railway and filing them with the shipper does not in general bring the desired result. It should be the freight solicitor's duty fully to acquaint himself with the tonnage moving to and from his territory at all times, and be able to anticipate shipments of seasonable goods far enough in advance to make early solicitation and to have routing by way of his line based on orders sent in. The representative at the shipping point should also be kept fully informed. Local agents along the line can also assist in this work by transmitting to the traffic department full particulars regarding shipping information which they pick up from time to time.

Among other ways mentioned by Mr. Stoffel in which freight traffic can be developed were co-operation with civic bodies interested in the advancement of their communities with a view to securing new industries for the towns and locating them near electric railway lines, finding new markets for established industries, assisting industries in locating and securing raw materials, and even creating a fairly new industry for the territory. As an example, through the traffic department of one electric railway, a tomato raising and canning industry was located along its lines, with the result that it enjoyed an excellent business hauling tomatoes to the plant and from it to distributing centers.

In conclusion, Mr. Stoffel urged the importance of using newspaper and other advertising, particularly cards or folders containing maps and information as to schedules, rates and service, which can be placed in the hands of traffic managers and shipping clerks. A lively discussion followed these remarks.

DISCUSSION ON FREIGHT MATTERS

Speaking for the freight department of the Rochester & Syracuse Railroad, H. C. Stanton said that on this property solicitors are employed the year round. They call at least twice a year at the intermediate stations and for the remainder of the time are at the terminals. Card records giving full data of calls are kept by the traffic department. Advertising is done by circular letters, cards in waiting rooms, etc. The freight business, said Mr. Stanton, must stand on its own feet. Business now needs to be gone after, as competition is keen and shippers are watching rates. As interurban rates are high, good salesmanship is required. It is important that every promise made be kept scrupulously. At the suggestion of H. H. Norris, ELECTRIC RAILWAY JOURNAL, who spoke of the advertising value of attractive freight terminals, Mr. Stanton described the new terminal at Rochester.

The necessity for getting new business was urged by W. J. Harvie and W. J. Lee, Auburn & Syracuse Electric Railroad, who reinforced Mr. Stanton's statements as to the importance of personal solicitation, say three to five times a year, to advertise the superior quality of the service and thus to offset the effect of the slightly higher rates. Another speaker suggested applying to the traffic business the principles followed by the manufacturers in knowing more about their customers' business in some particulars than the customers themselves, and in studying the ways in which the customers can be served. Further, there must be co-operation between the freight solicitors and the operating management so that the former will know what kinds of business are profitable and should be sought.

T. R. Langan, Westinghouse Electric & Manufacturing Company, said that if the electric railway people were as enthusiastic as the truck salesmen, and believed in themselves as thoroughly, they would get better results. He suggested as timely questions those relating to the obstacles which are met in selling railway freight service and to the extent to which electric railway traffic men are co-operating in the freight business. Other questions relate to the places in which the freight business can best be developed.

TRUCK COMPETITION NOT SERIOUS

As to the matter of truck competition, Mr. Stoffel said that this is not as serious as some seem to think. The chief difficulty with truck operators is to get them to keep accurate accounts of expenses. Most of them are living on the depreciation of their trucks. Trucks cannot compete with electric railways on runs longer than 20 to 25 miles. Some industrial concerns or merchants make their own deliveries up to 30 miles, but they would not find this profitable if they allowed for overhead expense. A large number of truck operators in business two years ago have now given up. Mr. Stoffel expressed the belief that electric railway men make too much of the truck competition, which he did not consider permanent. In answer to a question from Mr. Harvie as to the desirability of reducing electric railway freight rates to compete with steam railroad and truck rates, Mr. Stoffel said that this should not be done. The same basis of rates as that used by the steam roads should be used. Trucks cannot operate at less than American Railway Express Company rates. The superiority of electric railway service with respect to the effect on the shipment should be made much of. For example, milk and live stock are delivered in much better condition and the service excels on perishable products.

A. J. Manson, also of the Westinghouse company, said that success in selling electric railway freight service is largely a matter of analysis of the sales possibilities on a particular property. Moreover, steam railroads are going to become more congested in the future and they will find local business less profitable to handle as time goes on.

H. C. Page, general manager Worcester (Mass.) Consolidated Street Railway, said that his company is doing considerable freight business, which is an excellent business to develop, because once a customer is secured, he seldom gives up the service. This service is quicker and more reliable; there is no reason for fearing motor truck competition, because the electric railways will get their legitimate business in the long run and the limit of economical radius for truck service is less than 20 miles. Truck operators are not as enthusiastic as they were. The trouble with the electric railways is to get the equipment to handle the business. Direct truck service between New York and Worcester was inaugurated some time ago, but has not proved successful. As an example of electric railway freight service, Mr. Page cited the motor and trailer night train operated between Boston and Springfield. His company furnishes a two-man crew between Worcester and Springfield. The business is profitable. Freight cars are dispatched carefully just like passenger cars and steam road rates are charged. In conclusion, he said that his company would not think of giving up its freight business.

The discussion on freight and express traffic was closed with a number of short suggestions. D. E. Crouse, Rochester & Syracuse Railroad, said that electric railways should take a hint from the manufacturers and furnish their freight solicitors with "kinks" which would make the service attractive. H. N. Ransom, Westinghouse Electric & Manufacturing Company, asked as to the use of containers moved on flat cars, but this point was not discussed. Frank Hickey, Rochester & Syracuse Electric Railroad, urged that motor trucks be put under public service commissions to force them to carry their share of the road maintenance cost, etc. Mr. Stoffel said that motor trucks are going to be suitably taxed. Already substantial annual and mileage taxes are being levied and this will help to solve the problem of competition. Chairman Cherry agreed that rates should not be lowered in competition with truck and steam railroad service. The whole thing sums up thus, he said: "Good service deserves good rates."

One-Man Car Operation

A DISCUSSION of the advantages and disadvantages of one-man car operation was taken up immediately after luncheon. R. E. McDougall, manager traction lines New York & Harlem Railroad, told of his experience in operating one-man cars on the Eighty-sixth Street crosstown line in New York. This operation was begun as an experiment last July with double-truck cars having folding doors and steps. The only change made for their use in one-man operation was to lock the back door.

The crosstown line is approximately 1½ miles long and this service is now taken care of by ten cars during the off-peak period, with fourteen to sixteen cars during the rush hours. The cars are 37 ft. long, weigh approximately 15 tons and seat thirty-six passengers. The operation has been successful and the operators have had no trouble in handling the passengers. A small Johnson fare box is used and this is carried from end to end by the operator whenever he changes his operating end. This line is carrying approximately 14,000 revenue passengers and receives 4,000 transfers per day. The service is taken care of by operating a 3.7-minute headway during off-peak periods and a two-minute headway during rush hours. The scheduled speed is 7.7 m.p.h. and the cars are operating approximately 1,300 miles per day.

A noteworthy result of this operation is that the earnings have increased approximately 85 cents per car-hour and from 9 to 11 cents per car-mile.

Mr. McDougall said that there had been no increase in accidents other than some due to vehicular traffic, and this he believes was accounted for by the present use of twenty-eight city buses that were not in operation the previous year, with which the present operation was compared. Later, in answer to a question as to how he accounted for the increase in earnings, Mr. McDougall said that he believed some of this was due to people changing from bus riding to riding in the cars, as there had been a falling off in passengers carried by the buses. The motormen operating these cars receive 5 cents per hour more than those operating two-man cars. No breaking-in period was used at the time of starting the operation. A notice was posted and verbal instructions given, but otherwise no additional instructions were given the motormen.

W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company, told of the experiences that his company has had in operating Birney safety cars during the past year. He said that no subject is of any more active interest at present than that of reducing platform expense and of realizing economies that result from safety-car service. The service in Brooklyn is quite varied. Operation of safety cars at the present time is over bridges which have a considerable length, and in suburban service where the stops per car-mile are comparatively infrequent. Also the cars are operated through a more-or-less congested district.

At the introduction of safety car operation, the service was given no particular publicity, and so far no serious trouble has been experienced from the riding public. The crews of these cars receive 5 cents per hour more than the regular rates, which are 57 cents to 67 cents per hour.

Mr. Gove said that at present the Brooklyn surface lines are operating approximately 2,000 cars daily and he believes that there is a field in Brooklyn for the operation of at least 1,000 safety cars at the present time.

DESIRE FOR LARGER CAR DISCUSSED

In regard to various criticisms which are being made of the Birney type of safety car, which would seem to indicate a desire for a larger and heavier car, Mr. Gove said the more quickly the operators divorce themselves from the experiences which they have had with other types of cars the better it will be for all concerned. The only excuse for adding more weight is to increase the strength, and while at present truck drivers in Brooklyn seem to feel that they can take somewhat more liberties with the light cars than they would attempt with the heavier ones, still Mr. Gove said that he had found that while accidents are more frequent the repairs can be more easily taken care of. The type of construction permits of the cars being put back into shape with less cost than would be the case with heavier type of construction. As a result of the one year's experience Mr. Gove felt that the maintenance cost which had been occasioned by accidents was not particularly high with the safety car.

At the present time the Brooklyn company is contemplating changing over 200 double-truck cars for one-man operation. These cars are provided with what is called a "one-third vestibule" and changes will have to be made in order to provide folding doors and steps. It is the intention to use all the standard safety devices in equipping these cars.

In answer to a question by J. K. Choate, vice-president J. G. White Management Corporation, Mr. Gove said that, comparing the probable life of the Birney car with the life of standard cars, he considered the life of the New York Municipal's subway car to be approximately thirty-three years and that of the safety car to be about twenty years. In regard to over-motoring safety cars to reduce maintenance cost, Mr. Gove said that he did not recommend this practice, but that care should be taken not to overload the motors by using safety cars to push snow out of the way. The experience in Brooklyn in the winter of 1919-1920 was somewhat discouraging during the first snowstorm, as due to lack of knowledge on the part of the transportation department quite a lot of safety car equipment was burned up. Profiting by this experience, the safety cars were run in as rapidly as possible during the late snowstorm and no attempt was made to operate them through snow.

CHICAGO CAR REFERRED TO

Mr. Choate referred to the opinions being voiced by some operating men that the single truck is a mistake for safety-car operation, as this type of truck rides badly over rough track in pavements and there is sure to be nosing on any track. Mr. Choate said that in Chicago they were now building a car for trial with maximum-traction trucks and of a slightly larger capacity. He felt, he said, that one-man cars have led to more overloading than has been experienced with any other type of car. He also said that he did not believe that the present light-weight cars would last twenty years and that a somewhat stronger construction was desirable. In reply Mr. Gove said that it does not necessarily follow that because a car is light its depreciation is rapid. As maintenance is probably the most vital factor, if a car was kept up in proper condition its life will be increased materially.

As to the use of a larger car, Mr. Gove said that he does not consider the safety car other than as a development of a unit; there is a wide field for the present type of car and just as wide a field for a double-truck car or a larger car. It would, however, be a serious mistake to have too many designs of safety car. No doubt improvements in car construction and equipment can be made in the present car, and these of course should be incorporated. In regard to brake rigging, he considers the present design safe and especially so when used with steel wheels as in Brooklyn.

In reply to a question as to the effect of over-motoring the cars and the desirability of doing this with any new equipment, A. J. Manson, Westinghouse Electric & Manufacturing Company, said that motors operating at 100 per cent of their full load rating would have a certain temperature rise. If the motors were operated at 80 per cent of their rating the temperature rise would be nearly as great, so that the life of the windings, which necessarily depend upon the temperature rise to which they are subjected, would not be materially longer. He said, however, that under overloading the conditions were somewhat different, as if the equipment was operated at 110 per cent of the full load rating the overheating would no doubt do considerable damage.

D. W. Burley, superintendent of transportation Binghamton Railways, said that his company had converted some cars for one-man operation. These cars have a seating capacity of twenty-eight and carry loads of considerably over a hundred during rush hours. These cars are used in service with regular two-man cars and their introduction has not slowed up operation in any respect. The trucks have a long wheelbase and ride very easily. Originally iron wheels were used, but the railway is now changing to steel wheels and finds these much better as there is less chipping of flanges.

In reply to a question as to experience of railways in operating over railroad crossings and the precautions that are necessary, Charles Brooks of the Poughkeepsie & Wappingers Falls Railway said that this company's cars operate over two such crossings. The procedure is for the operator to stop his car and go to the crossing so as to make certain that no train was approaching, then return to the car and cross as soon as possible. A trolley guard is used over such railroad crossings.

F. A. Stratton, president Peekskill Lighting & Railroad Company, said that the light cars save power as well as platform expense; but that his experience showed them not to be adapted to snow conditions. A 7-cent fare is in force in Peekskill and the cars carry large loads over very severe grades. They keep up to schedule and operate well.

H. C. Page, general manager Worcester Consolidated Street Railway, said that ten Birney-type safety cars and one converted one-man car are operating in Worcester and that the operators seem to like the converted type even better than the Birney. The car has a large standing capacity, due to its longitudinal seating arrangement, and it is earning about 10 cents per car-mile more than the standard Birney car.

Hazard of Faulty Switchboard Construction*

Certain Factors Must Be Considered if Switching Apparatus in the Modern Power Plant Is to Be Installed with Due Regard to the Safety Feature

BY ROSCOE M. BERT
Electrical Superintendent Rockford Electric Company, Rockford, Ill.

THERE are many power plants in operation all over the country, with switchboards for 2,300 and 4,000-volt systems, which are entirely inadequate properly to perform the true function of a switchboard in emergency. There is now available considerable information as to what makes possible a reasonably safe switchboard under all conditions of short-circuited cables and busbars. To obtain proper safety the following points must be carefully considered: (1) Ultimate capacity of generators installed. (2) Reactance of generators when all are operated in parallel. (3) Proper location of external reactance to limit short-circuit currents. (4) Selection of an oil switch which will rupture the circuit under the worst possible conditions. (5) Proper arrangement of the apparatus to reduce life and fire hazards.

In many cases the point has been overlooked that any switch connected to a main busbar should have rupturing capacity equal to the total short-circuited capacity of all generators in operation, or at least should be protected by reactors to within the limit of the rupturing capacity of the switch, and, of course, protected by dependable relays.

In the past few years many stations of comparatively small capacity have made additions of large turbine generators and connected them to the existing switch equipment, and in many cases have "gotten by" with no serious results, but in others serious fires and accidents have occurred. As long as service is satisfactory and until an accident occurs we do not realize the dangers that exist. Recently this was very forcibly brought to my attention at a property in Indiana. In this instance an oil switch short circuited and blew up, killing two men and destroying by fire half the bus structure, a quantity of cable and damaging several motor-generator sets. Property damages amounted to approximately $20,000. Had the repair man and operator realized the danger and had sufficient apprehension as to possible results, the loss of life and most of the property damage could have been avoided.

As a result of this accident our engineers have decided completely to rebuild the switching equipment of the Rockford property and all others which are in an unsafe condition. All switches and busbars will be placed out of doors, using weatherproof apparatus completely. This has been done for some years for high-voltage equipment for 13,000 volts and above, so why not for 2,300 and 4,000-volt systems? The details of this scheme have not been fully worked out, but we have consulted manufacturers' engineers and they think it feasible.

Frequently switchrooms are partitioned off from all other parts of the power house, and are seldom seen by the operators. I would advise that openings be provided if possible that any incipient fire could be promptly seen by the station men. These openings should serve a further purpose, that is to allow men to escape in case a fire starts while they are working on the apparatus in these compartments.

Operators should be cautioned regarding accuracy in synchronizing of generators, as this is very severe service on switches unless done accurately. To improve this accuracy, I would recommend the use of a synchroscope with a very large dial and the cautioning of station men to take plenty of time in putting machines on the lines.

Bulletin on Employment of Women as Conductors

THE success of the employment of women street car conductors or ticket agents in Boston, Chicago, Detroit and Kansas City is described in a bulletin just issued by the Women's Bureau of the United States Department of Labor.

Conditions for street car conductors were not ideal, according to this report, but no reason was found to prove that the work of a street car conductor was not fit for women. Neither the history of the employment of women on street cars nor the many disputes which arose over their employment were sufficient reasons for the final decision of the men's union that street car conductor's work was "unfit for women."

The discharge of many women ticket agents as well as conductors of the street railways of New York City in 1919 was the reason for the making of this study, as the Department of Labor did not consider these companies justified in the claims that they could not employ women and adhere to laws which had been passed regulating their hours of work. In conclusion the report states, "records from Chicago and Boston show that with the eight-hour day and six-day week, without night work, and with a wage far superior to that paid women in many other occupations, the woman ticket agent and collector is an accepted and permanent fact in two large cities. The fact that these conditions are far better than those prescribed by law in the same communities shows that some other contributory factor must be present when women are dismissed from this work because of the requirement for them of reasonable hours of work."

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*Abstract of paper presented before the Illinois Electric Railway Association in Chicago, March 16, 1921.

Electric Locomotives for the Austrian State Railways

Four Types of 15,000-Volt, Single-Phase Locomotives Have Been Designed to Meet the Various Conditions of Traffic Requirements, Topography and Track Limitations

By ARTHUR PALME

THE reasons which prompted the Austrian State Railways long before the war to electrify its roads hold true in a far greater measure for the new republic of Austria. The former Austrian monarchy was rich in coal, so that electrification of its railways was based almost exclusively upon the relative cost comparison between steam and electric traction. Today, as the republic can supply only 16 per cent of its coal requirements, it is under the necessity of electrifying all of its roads, thereby to maintain its railroad traffic and industries more nearly regardless of the high price of imported coal and the irregularity of its supply.

In the bill passed in July, 1920, the electrification of 40 per cent of all the main roads of the republic was specified. The lines included in this bill were enumerated in an article in the March 5 issue of the ELECTRIC RAILWAY JOURNAL by E. C. Zehme. Work has already begun on one of the most important of these lines, the Arlberg line from Innsbruck to the Swiss frontier near Bregenz.

Austria shares fully the general middle European railroad dilemma; that is, the doubt as to the most favorable system to adopt. Extensive studies of a general character and of the specially required best solution, however, led finally to the selection of the alternating-current, single-phase system with the low frequency of 16⅔ cycles per second at an overhead wire tension of 15,000 volts. The possibility of using three-phase current was not seriously considered on account of the much higher investment cost. One of the main reasons why high-voltage direct current has been eliminated is the lack of European experience with this system, and the necessity for extensive developmental and experimental work on the part of the Austrian and German electrical concerns in connection with this system, whereas all details for the alternating-current system had been developed and well tried.

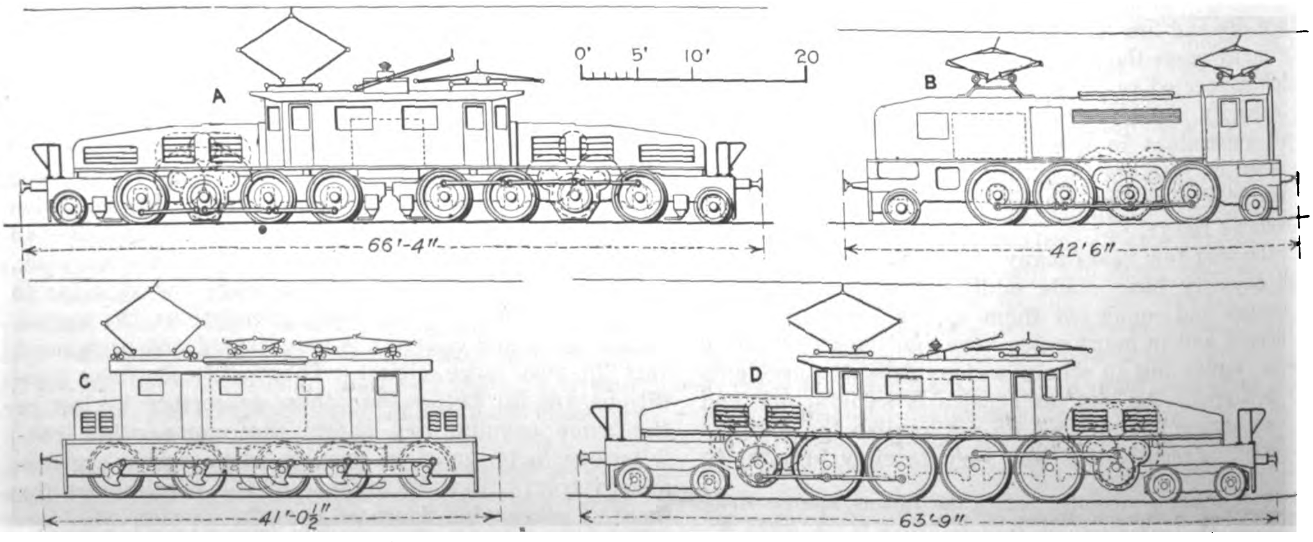
The topographical character of the planned lines is diversified. While there [illegible] mountain stretches with grades as steep as [illegible] per cent and unfavorable right-of-way, there are also long stretches of down grades so straight that speeds up to nearly 60 m.p.h. are being reached now with steam locomotives. In addition, very different traffic requirements exist on the various lines. For that reason four types of electric locomotives have been ordered to take care efficiently of the different kinds of service required by fast and slow passenger traffic and freight service. In order not to overload the present rails and some of the old bridges a limit of 16 tons axle pressure and a locomotive weight of not exceeding 2.3 tons per foot of over-all length have been established. All locomotives are built safely to round a curve of 500 ft. minimum radius. They will all be equipped with alternating-current series commutator motors, operating on a voltage reduced from 15,000 to 400-1,300 volts, transmitting their power to the drivers directly by gears or by gears through a jackshaft to coupling rods. All locomotives will have the automatic vacuum braking system, customary in Austria.

The following types of engines have been standardized and ordered:

DATA ON LOCOMOTIVES FOR AUSTRIAN STATE RAILWAYS

Type	Weight, Tons	Length, Ft.	Horsepower		Dia. of Drivers, In.	Gear Ratio	Motor Voltage	Transformer		Capacity
			Continuous	One-Hour Rating				Rating, Kva.	Voltage	
1C + C1	127.5	66.3	2,000	2,460	53	1:3.2	575	2,000	15,000/1,240	396 tons at 31 m.p.h. on 2.64% grade 330 tons at 28 m.p.h. on 3.14% grade Maximum speed—40 m.p.h.
1C1	76	42.5	780	1,100	63.5	1:4.0	520	800	15,000/1,050	330 tons at 25 m.p.h. on 1.4% grade 220 tons at 21.5 m.p.h. on 2.5% grade Maximum speed—40 m.p.h.
E	80	41.0	.....	.....	57	1:6.3	...	850	15,000/440	1,100 tons at 18.5 m.p.h. on 0.8% grade Maximum speed—31 m.p.h.
2BB2	108	63.7	....*	.....	....	.....	..*	....*	15,000/*	495 tons at 18.5 m.p.h. on 1.5% grade 638 tons at 25 m.p.h. on 1.0% grade 715 tons at 50 m.p.h. on level Maximum speed—62 m.p.h.

* Electrical data not yet fully determined.



SIMPLIFIED ELEVATIONS OF THE FOUR TYPES OF AUSTRIAN LOCOMOTIVES

1. Express locomotive for mountain passenger service, class 1C + C1.
2. Passenger and freight locomotive for medium mountain road service and light freight, class 1B1.
3. Heavy freight traffic locomotive for level and mountain roads, class E.
4. Heavy express passenger locomotive for level and medium mountain service, class 2BB2.

The principal characteristics and outstanding features of these locomotives are shown in the accompanying table and illustrations. In general the same characteristic type of construction prevails, that is side rods driven from a jackshaft to which the motors are geared. However, the mountain freight type of locomotive differs from the other three designs in the detail that the motors are geared directly to the wheels, while all five axles are rods coupled. The 1C + C1 type will be used for pulling through trains over the steep grades of the Arlberg road.

In order to permit starting of electric operation before all roads are completely electrified, a number of battery-car trains are being built, each consisting of the battery car in the middle of the train and two passenger cars on each end. Two of the passenger coaches are trailers and two are motor cars which have a total motor output of 190 hp. at a normal speed of 22 m.p.h.

The batteries to be used weigh 20 tons and have a capacity of 222 amp.-hr. at 520 volts. The capacity of such a train, which is for auxiliary purposes and short distance only, will be 176 seated and 130 standing passengers.

Wisconsin Association Meets

Safety Car Operation and Construction, Street Railway Rates and the Use of Weekly Passes Are the Main Topics Discussed by Railway Members

IN JOINT meeting with the Wisconsin Gas Association, the Wisconsin Electrical Association met in its thirteenth annual convention on the afternoon of March 23. This session of the association was presided over by William C. Lounsbury, Superior, Wis., president of the electrical association, and it was occupied with broad utility matters. The meeting was addressed by Charles B. Scott, member of the national safety committee of the National Electric Light Association and general manager Bureau of Safety, Chicago, on some of the hazards of the electrical business and how to guard against them. A report on the work of the Wisconsin Public Utilities Bureau, organized during the past year for the purpose of spreading information about the public utilities to the public, was made by Frantz Herwig, director. R. V. Prather, secretary of the gas, electric and electric railway associations of Illinois and of the Great Lakes Division of N. E. L. A., read a paper setting forth in very able manner the various aspects of the need for associations of public utility companies, the purposes of such organizations and the obligations of the companies to them.

A banquet at the Pfister Hotel on the evening of March 23 concluded the joint convention. N. J. Whelan acted as toastmaster of this function and Edgar A. Guest was the speaker of the evening. A good deal of entertainment was afforded to the members by the distribution of several articles as gifts to different members of the association.

The Wisconsin Electrical Association held a separate meeting on March 24, at which time the president's annual address was read and various committees made their reports. Speaking of the railway situation, President Lounsbury said: "The street railway situation is not nearly as discouraging as it has been for the past few years. In many places it is indeed dark. The truck, the pleasure car and the former rapid expansion of lines increasing the long haul, together with the extremely high operating expenses, have been disastrous in their consequences, but from the confusion comes a realization of the importance of the street car and a better public appreciation of its worth to the community."

For the steam road crossing committee, C. R. Phenicie, Wisconsin Public Service Company, reported that the Wisconsin Railroad Commission had done an extensive work in classifying all crossings and tabulating them with the clearance, grade, angle, protective devices used, etc., all of which was considered to be of little value to the electric railway. He said that an effort had been made to co-operate with the steam railway officials who had this matter up before the commission, but the latter had refused to co-operate. The committee advised the association to recommend to the commission that a whistle post be installed on the approach of all steam line crossings with electric railways, and that trains be required to slow down to 25 miles per hour for the crossing. In discussing this report, which was adopted by the association, Dudley Montgomery brought out that it is the practice on his property in Madison, Wis., for the motorman to flag his own car in all cases, two-man as well as one-man cars. He does this by getting off his car and running across the tracks to make observation.

Several brief papers on one-man car operation were then read by Messrs. Arnold, Howard, Montgomery and Phenicie. Some of these appear in abstract in this issue and the others will be published later. In the discussion which followed, Mr. Montgomery took issue with the question raised by one of the speakers as to the use of the name "safety" in connection with the small one-man car. He said that the car had well earned its name, for the number of accidents had been very greatly reduced as compared with any other type of car. He said also that many companies had always wanted to use one-man operation but were not able to do so until the safety devices were invented.

H. A. Mullett, Milwaukee, spoke briefly of the use of safety cars in Racine and Kenosha, Wis. He pointed out that the design of these cars had included double flooring, side sheathing and head lining, steel wheels instead of cast, hot-air heaters instead of electric, and spring-cushion seats. He said that the standard width door, 30 in., had been used thus far, but the company had some feeling that a wider door would be better. He spoke also of the present consideration given to the air system to prevent freezing, and said that not a single case had developed during the past winter. Since the installation of safety cars in these two cities, there has been such a falling off in the general business handled by the company, that Mr. Mullett said it was impossible to make any comparison as to the savings, increase in business developed by the more frequent headway, etc.

He spoke of the weekly pass which has been in use in Racine for two years and was recently adopted in Kenosha as well. The principal advantage claimed for this unlimited pass is that it promotes the habit of riding and encourages riding, particularly during the off season. During the winter of 1920 the company sold about 2,000 passes per week, the revenue from which amounted to about 15 per cent of the total. During the summer, when the amount of traffic always falls off in Racine, the number of passes sold averaged about 1,300 per week, which accounts for 10 or 11 per cent of the total revenue. For the first three months of this year 2,200 passes per week have been sold, approximately 20 per cent of the total revenue coming from this source. Mr. Mullett said that these passes are very popular in Racine. They are sold for 98 cents to the trainmen, who distribute them to the riders for $1 each. He said it has been impossible to determine definitely how much increase in riding has been fostered by the use of these passes, but mentioned the fact that many downtown restaurants had protested because a good many of their customers were now going home to lunch.

W. H. Sawyer, president East St. Louis & Suburban Railway, made a plea for companies to hold to the standard design of safety car, because of the many advantages accruing from the reality of standardization. He ridiculed the contention of "local conditions" often used to support an argument for a different design.

Mr. Sawyer then presented a paper on street railway tariffs, in which he reviewed the study and findings of the committee on fares of the American Electric Railway Association and gave the result of some recent investigation on his part as to the results obtained from the inauguration of 10-cent fares in various cities. His principal conclusion was that higher fares do produce increased revenue, and that where the rate of fare must be above 5 cents, a 10-cent cash fare with reduced ticket rates is the best form of tariff. His paper will appear in abstract in a later issue.

The following officers were elected to conduct the affairs of the association for the ensuing year:

President, J. P. Pulliam, vice-president in charge of operation Wisconsin Public Service Company, Milwaukee, Wis.; first vice-president, Harold L. Geisse, Milwaukee; second vice-president, P. D. Kline, vice-president Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.; third vice-president, Harry R. Ellis, vice-president and general manager Eastern Wisconsin Electric Company, Sheboygan, Wis., and secretary, W. M. Chester, 1408 First National Bank Building, Milwaukee, Wis., assistant to Mr. Pulliam in the Wisconsin Public Service Company.

Why Not the One-Man Car?

By B. W. Arnold
Manager Eastern Wisconsin Electric Company, Oshkosh, Wis.

THE name "safety car" as applied to this new type of car operated by one man I feel is an error, because there is no such thing as a safety car any more than there is a safety shot gun or safety revolver. Either is safe if properly handled, but neither is safe if improperly handled. Accidents will always continue to occur as long as they are in use. Can you imagine the feeling of some poor chap who has been unfortunate enough to be struck by a car and knocked to the side of the road and, while lying there waiting for the ambulance, he sees in large letters on the front of the car the words, "safety car"?

I am heartily in accord with the different safety devices which have been installed on this new car. The feature of the emergency action from letting go of the controller handle and the handling of doors and steps by engineering valve are both a distinct development in the art of car control and of great benefit in preventing accidents. But to operate all of these safety devices we again revert to the human element, and that, as we all know, is subject to failure as are mechanical devices. I therefore see no need of any departure from the old honored name of "street car" when this new car is placed in operation in any community.

Some opposition has been encountered in some parts of the country to the operation of street cars with one man, but I feel this is simply another problem for the local management to work out and sell to the public. With the fine results obtained in so many cities, this should not be such a hard problem at this time.

That the light-weight car operated by one man has passed the experimental stage and is here to stay cannot be doubted, as the large number of these cars in operation and on order proves that the public is for them. I have always felt that a motorman and conductor on cars operating in cities up to 100,000 population, except perhaps on some heavily traveled lines, is an economic waste. When the motorman is at work the conductor is idle, and when the conductor is at work the motorman, to use the expression of the South, is "just standin' 'round." The new car eliminates this loss.

The proper method of flagging steam railroad crossings is a matter to be worked out by local managers with the aid and advice of the railroad commission engineers. On our property we require the operator to bring the car to a stop at a sufficient distance from the crossing to insure gate clearance. He then leaves the car and goes to the center of the crossing for observation before proceeding. By this method he not only flags the crossing with his eyes but with his ears as well. By requiring him to leave the car one makes certain that he will stop for the crossing

Apply Salesmanship to Car Rides as Well as to Power

Mr. Street Railway Manager, you have something to sell, namely, rides on your cars. At Christmas time, when you are booming the sale of electric washing machines, irons, open gas grates, etc., your new business department has beautiful ribbons and holly tied on them. But you totally forget to put any of that holly or ribbon in your street cars when they start

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*Abstract of paper presented before Wisconsin Electrical Association, March 24, 1921.

out to bring in more nickels than the profit from the sale of all the appliances for the entire month.

Give the street railway an equal chance with the remainder of your business. Provide careful, courteous operators for your cars; have them clean and on time, all the time, not some of the time. In other words, sell your service to the people in such a way that they will want to buy it, and with the savings possible by the new type of car the figures on your balance sheet will be more pleasing at the end of the month.

One-Man Operation Is Very Desirable*

By R. M. Howard

Vice-President Wisconsin Railway, Light & Power Company, Winona, Minn.

Most of the discussions we hear revolve around the light-weight single-truck car equipped with safety devices, and the tendency has perhaps been along the line of unduly emphasizing the importance of the car rather than the principle of one-man operation. Possibly it has been necessary to do this in order to establish one-man operation, and if so, perhaps we have been poor salesmen in selling the one-man operation idea to the public.

The primary idea of one-man operation is to keep the total cost down to the point where we can sell a ride to the public at a price that will encourage the use of our facilities. If we can only put this idea over to the public and secure the full co-operation of the public, one-man operation will need no defense, and it will become the standard everywhere except in zones of heavy traffic.

As I view one-man operation, the only valid objections that can be made by the public refer to time required to make change and slightly longer time required for loading at heavy traffic points. The odd penny fare complicates change making, and possibly a cash fare for transient and occasional rides sufficiently higher than the regular ticket rate to encourage the use of tickets by say 80 per cent of the riders may be the solution of the fare question.

The delay at loading points is very slight; it seldom has any effect on the schedules, and if the riders can be brought to the realization that the slight inconveniences mentioned insure the maintenance of a lower fare than is possible with two-man operation, it will not matter whether single or double truck cars are used.

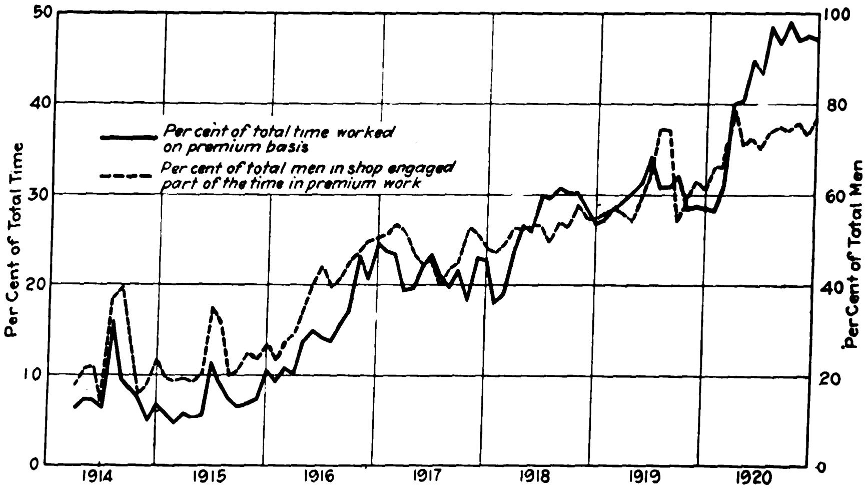
I believe the time is past due for the inauguration of one-man operation on many lines using double-truck cars. We are all suffering from a heavy reduction in earnings. We are carrying a heavier platform wage scale than was ever contemplated when our industry was developed. We are passing through what is politely called an adjustment period. The best adjustment we can make is along the lines of greatly extended use of one-man operation with such cars as our financial situation permits.

I do not want to convey the impression that we are opposed to safety cars, as the reverse is true, and our last purchase was standard safety cars which are operating very satisfactorily.

If the present depression continues we will have to follow the downward curve of earnings with a corresponding drop in operating expenses, and inability to finance or the time required to secure new cars if money is available for their purchase may compel the use of existing equipment with one-man operation.

Results of Premium Wage Plan

In the article by J. H. Lucas describing the premium wage plan used in the Milwaukee Electric Railway & Light Company's shop, which was published in the Electric Railway Journal for March 19, page 529, reference was made to the percentages of the total force engaged on premium work and to the percentage of man-hours time for work done. The accompanying graphs which were omitted from the previous article served to give a picture of present conditions and the increase that has been made since 1914. At the present time 76 per cent of the working force is engaged part of the time on premium work and nearly 50 per cent of all the man-hours time in the shop is for work done against standard time allowances and in a standard manner. The figures taken for arriving at these percentages of working forces and hours are total figures, which include the supervisory time as well as the time of the productive workers. These graphs also show that, due to the necessity for preparatory observations in establishing standard times for the various operations, the extension of the premium system must be gradual and somewhat slow at first.



GRAPHS SHOWING INCREASE IN THE APPLICATION OF THE PREMIUM SYSTEM TO SHOP WORK IN MILWAUKEE

New International Association Formed

The organization of the new international association of street and interurban railways, mentioned on page 228 of the issue of this paper for Jan. 29, has been completed. The countries included are those in Central Europe. The president is L. Spängler, director of the Municipal Railway in Vienna, and the vice-president is Dr. Wussow, general manager of the Berlin Street Railway System. The members of the executive committee are: J. F. S. Barth, Christiania, Norway; W. von Châtel, Budapest, Hungary; E. Hultman, Malmö, Sweden; Paul Libowitzky, Oderberg, Czechoslovakia; Kai Norregaard, Copenhagen, Denmark, and T. E. van Putten, Amsterdam, Holland. The secretary is Dr. A. Ertel of Vienna.

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*Abstract of paper presented before Wisconsin Electrical Association, March 24, 1921.

Association News

Equipment Committee Holds Busy Session

A TWO-DAY meeting of the equipment committee of the Engineering Association was held at association headquarters on March 23 and 24. The first day of the meeting was taken up with a discussion of the various subjects by sub-committees and the second day with general reports and discussions before the entire committee. Those present were: Daniel Durie, West Penn Railways, chairman; W. S. Adams, the J. G. Brill Company; H. A. Benedict, Public Service Railway of New Jersey; R. H. Dalgleish, Capital Traction Company; James C. C. Holding, Midvale Steel & Ordnance Company; T. R. Langan, Westinghouse Electric & Manufacturing Company; F. H. Miller, Louisville Railway; C. N. Pettinger, Steubenville, East Liverpool & Beaver Valley Traction Company; E. D. Priest, General Electric Company; C. F. W. Rys, Carnegie Steel Company; C. F. Scott, General Electric Company; Karl A. Simmon, Westinghouse Electric & Manufacturing Company, and C. W. Squier, ELECTRIC RAILWAY JOURNAL. In addition to the regular members of the equipment committee, representatives of various manufacturers were present at the invitation of the committee to assist in developing standards for steel wheels, cast-iron wheels and gearing.

The work of revising the association standards for tread and flange contours for steel wheels and preparing a standard wheel contour for cast-iron wheels received considerable attention. This work is progressing very satisfactorily.

The American Gear Manufacturers' Association has drawn up a specification for gearing which is nearly the same as the present standard employed by the association and it is thought that the two specifications can be harmonized without undue difficulty.

In connection with the study of helical gearing which the committee is making, engineers from the General Electric Company presented an interesting demonstration with full-sized models to illustrate the effect of various degrees of helix angle and varying width of face. Representatives of the Westinghouse Electric & Manufacturing Company and of the R. D. Nuttall Company were also present and gave the committee the benefit of their experience in connection with the use of helical gears.

The sub-committee appointed to study the life of wearing parts and to report on shop practices relating to improving wearing qualities of parts is to obtain information from a large number of properties through personal observations made by members of the equipment committee. In order that the type of information obtained may be uniform, a questionnaire was outlined for the use of members only. It seemed probable that a reel or two of motion picture films could be arranged for presentation at the convention to illustrate the best manner of carrying out certain operations that would be of benefit in providing longer life and the chairman of this sub-committee is to obtain opinions regarding practices that appear desirable to have illustrated.

The sub-committee which is studying the present status of direct-current lightning arresters has formulated a questionnaire which will be sent out to all member companies to obtain additional information regarding this subject.

In connection with the design of a typical shop building, decisions were reached as to the number of departments and their relative size that should be accommodated and also various details of construction for convenience, safety and efficient handling of work. Studies have been made of about twenty-five shops and much valuable information is being tabulated. This sub-committee is working in conjunction with the committee on building and structures.

Work of Advertising Section Ready for Distribution

THE Advertising Section of the Division of Information and Service, American Association, has prepared for distribution various pieces of advertising material which member companies may obtain upon application.

The findings and recommendations of the Federal Electric Railways Commission have been epitomized and prepared for distribution in three different forms. There are two cards printed on stiff cardboard, one for wall display, containing briefly the findings and recommendations of the commission, and another a small card for desk use, containing the recommendations only. These cards will be supplied free in any amount to companies desiring them.

A series of fourteen suggested car signs have been prepared in miniature form and may be had free of charge upon application.

Six suggested newspaper advertisements presenting various phases of the Federal Electric Railways Commission report and other material of publicity value to electric railways are in readiness for free distribution upon application.

Two leaflets, "How to Keep the Hired Help on the Job" and "Right Over the Plate," also are ready for distribution. The first of these contains a series of seven constructive suggestions by Paul P. Haynes, a member of the Indiana Public Service Commission, that are of great publicity value. The other leaflet, "Right Over the Plate," is devoted to President Harding's views on the electric railway situation. The outside of the leaflet carries a reproduction of a picture of the President in the attitude of pitching a baseball, which, linked with the title of the leaflet, makes a very attractive and effective cover design. Both of these leaflets are being sold at cost, which ranges from $2.50 to $3 a thousand, depending upon the quantities on order whenever it is deemed advisable to go to press. Approximately three-quarters of a million of these two leaflets have already been ordered. The Advertising Section also has available a summary of all references to electric railway affairs which the various state Governors made in their inaugural or initial messages to their Legislatures this year.

In addition to supplying copy and making suggestions for copy to companies, the Advertising Section is very glad to give suggestions or advice in specific cases when it is desired. Companies that are planning an advertising campaign or are preparing advertising literature can have it reviewed by the Advertising Section upon request.

Accident and Claims Statistics Discussed

ON MARCH 30 the committee on claims statistics met at association headquarters. It was brought out that since last July nearly 150 requests for information on accidents have been answered by the bureau of information. The statistics collected by the committee last year had been the means used to answer these inquiries. In view of the completeness of this data, it was believed that the expense involved in duplicating the information by a further request at this time was unwarranted.

Those present at the meeting were C. F. Briggs, Public Service Railway, chairman; W. F. Weh, Cleveland Railway, and J. S. Kubu, New York State Railways. J. W. Welsh, acting secretary of the association, was also present.

T. & T. Executive Committee Hears Progress Reports

ON MARCH 25 the Transportation & Traffic Association's executive committee held a meeting to hear reports on how the work of the various committees was progressing. It is planned to have all reports in by July 15 so that they can be printed and distributed well in advance of the convention.

Those present in addition to President R. P. Stevens were L. H. Palmer, United Railways & Electric Company of Baltimore; G. T. Seely, Pennsylvania-Ohio Electric Company; J. K. Punderford, the Connecticut Company; T. C. Cherry, Rochester & Syracuse Railroad; J. V. Sullivan, Chicago Surface Lines, and J. W. Welsh, acting secretary. The following committee chairmen read brief reports as to how the work assigned to their committees was progressing. H. B. Flowers for the committee on traffic regulations; J. P. Barnes for the committee on personnel and training transportation of employees; F. W. Coen for the committee on express and freight traffic promotion and costs; G. T. Seely for the committee on merchandising transportation; H. C. Mosher for the committee on economics of schedules; R. E. McDougall by letter for the joint committee on safety.

The resignation of E. B. Burritt as secretary-treasurer was accepted and J. W. Welsh was elected acting secretary to hold office until such time as the American Association elects a permanent officer.

The committee discussed to some extent the lightweight one-man car now rather extensively used throughout the country. In view of the wave of legislation that has recently developed against this type of car, the committee deemed it advisable to call up the whole question of one-man cars before the American Executive Committee at its meeting April 12 for definite recommendations as to what if any further study can be made by the association.

Safety Committee Holds Enthusiastic Meeting

ON MARCH 28 the joint T. & T. and Claims Association committee on safety held its second meeting of the year at association headquarters. Those present were E. C. Spring, Lehigh Valley Transit Company, and R. E. McDougall, New York & Harlem Railroad, co-chairmen; H. O. Allison, Beaver Valley Traction Company, proxy for W. H. Boyce; J. S. Kubu, New York State Railways; C. B. Scott, Chicago Edison Company; A. J. Van Brunt, Public Service Railway, proxy for H. V. Drown, and W. F. Weh, Cleveland Railway. J. W. Welsh, acting secretary, also attended the meeting.

Representatives of the National Safety Council appeared before the committee and explained plans they had in mind for entering the public safety field and asked the committee for its moral and financial support by urging electric railway companies to take out membership in the council. The committee believed that the good results could be obtained by making the joint safety committee a permanent standing committee and the clearing house for the dissemination of information concerning safety work among electric railway companies.

It is hoped that a joint session of the T. & T. and Claims Association can be arranged at the coming convention for the purpose of discussing fully safety work as recommended by the committee and now being conducted by various electric railway companies, not only as it affects its own employees in the shops but the public as well.

Another meeting of the committee is planned for May 10, at which time it is hoped to complete the report.

Meeting of Chicago Elevated Section

THE Chicago Elevated Railroad Company Section met March 22 with about 185 members in attendance. J. H. Mallon, president, occupied the chair. The address of the evening was by A. L. Gardner on the subject of railroad taxation and the speaker described the various taxes which a railroad pays on its different classes of property. There were also two or three musical numbers presented by the Oak Park Trio and William G. Wood, with dancing by Messrs. Ryan and Coleman.

Camden Section Hears New Traffic Ordinance Explained

THE monthly meeting of the Public Service Camden section was held on March 18 at the Newton Avenue carhouse. The guest of honor and speaker was Frank S. Van Hart, president of the Camden City Council. Mr. Van Hart spoke principally on the traffic situation in Camden, explaining the new traffic ordinance in detail. He said the ordinance was designed for the good of the people and the city as a whole and not to favor any particular class.

Mr. Van Hart commended the drive being made by the trainmen to make a better public feeling for the company and said that not only he but also many of his friends had noticed a great improvement in the manner with which trainmen had handled the public in the last few months. He cited actual examples of how trainmen had gone out of their way to please the patrons of the trolley company. Mr. Van Hart also explained that the City Council was always open to new suggestions or criticisms in relation to the new traffic ordinance and would welcome any communications from the trainmen. The Council realized it was impossible to have the ordinance perfect at first, but it felt that after the present arrangement was tried out, additions and betterments would be suggested and put in force to give Camden the reputation of having the best regulated traffic in the country.

Recent Happenings in Great Britain

Wage Court Recommends Continuation of Present Wages Until Dec. 31 Next—Cost of Proposed Glasgow Electrification Found to Be Prohibitive

(From Our Regular Correspondent)

The report of the Court of Inquiry to the Minister of Labor was published on March 8. It says the wage increases have not advanced at the same rate as the cost of living figure. The claim for increase of wages was made last October. Since then the cost of living figure has both risen and fallen. The court cannot predict its future movements. It recommended that the present wage standard should be maintained until Dec. 31 next; that the Industrial Council for the industry should consider the question of standardization, having regard to the earning capacity of the undertakings and to the interests of the public, and that the Council should examine the circumstances of the lower-paid grades with a view to adjusting their conditions on a more satisfactory basis.

IN THE opinion of the board, the Council should also examine the position of those undertakings which have not observed previous agreements and arbitration awards, and those undertakings should be advised that if possible the advances should be paid in full.

It remains to be seen what action the Ministry of Labor and thereafter the tramway employees will take. If the proposals are adopted by all parties there will be peace till the end of the year. By that time the cost of living may have further declined.

The claim of the tramway men was for an increase of wages of 12s. a week. The court of inquiry was set up by the Minister of Labor. The hearings consumed about ten days of time, spread over a period of several weeks. They were concluded on Feb. 18.

No Electrification Projects

The few references to electric traction made by the chairman of British steam railway companies at the annual meetings of shareholders held during February show that while the existing stringent financial and economic conditions endure there is little or no prospect of any new electrification work being carried out. The London, Brighton & South Coast Railway has tried, but so far without success, to get sanction from the Government for completing the electrification of its system. It was revealed by the chairman of the Caledonian Railway that the directors had considered the question of converting their underground lines in Glasgow and some of the adjacent suburban lines, but that the cost and the prospective traffic did not warrant the change.

While the chairman of the London & South Western Railway was able to say that the electrification of the company's suburban lines continues to be an immense success, he stated that the projected conversion of other lines further out of London has in the meantime had to be dropped. When the directors wanted to place contracts for two of these lines (Cobham and Leatherhead), they found that the cost of electrical equipment had advanced to such an extent as to make it very doubtful whether the work could be carried out for £1,000,000, as compared with a pre-war estimate of £250,000. All the companies are, in any case, pledged to abstain as far as possible from new capital expenditure until future conditions and the intentions of the Government with regard to the railways are more fully known. In regard to the completion of the electrification of the suburban lines of the London & North Western Railway, which was stopped owing to the war, that work is in progress, and it is hoped that early next year the new lines will be opened, so that electric trains will run out of and into Euston Station.

Dividend Reduced in 1920

The dividends paid by the group of London underground electric railway companies for the past year are even lower than usual, due to the increased cost of labor and materials. It is true that the companies last summer obtained parliamentary authority to raise fares, but the higher charges were in operation only during the last four months of the year. The records for these four months, however, are so encouraging that Lord Ashfield, presiding at the annual meetings of the companies (which were all held on Feb. 17), was able to take a fairly optimistic view of the future. He based himself, not only on the fact that the increased fares have produced a rise in revenue, but also on the confident expectation that the peak has been reached in wages and cost of materials. He thus looks forward both to larger revenue and smaller expenditure. The former may, however, be delayed by the present trade depression. Another encouraging feature is the beginning of co-operation with the London County Council Tramways—a matter to which I have referred in recent articles in these pages.

Lord Ashfield made a comparison of the receipts during the first three and the last three months of 1920, during the latter of which periods the increased fares were in force, and the results are interesting. (It may be recalled that the minimum fare was raised from 1d. to 1½d., with smaller proportionate increases for the longer distances.) On the associated railways the average receipts per passenger rose from 2.2d. to 3.0d. Taking some of the line separately, on the Central London Railway the receipts increased by 35 per cent, on the City & South London Railway by 30 per cent, and on the London Electric Railway by 27 per cent. In most cases there was a slight decrease in the number of passengers. The London General Omnibus Company, which is associated with the underground railways group, shows a deficit on the year's working, but the receipts for the last three months of the year showed an increase over the first three months of 23 per cent. Lord Ashfield is hopeful that matters will so improve that the railway companies will soon be able to raise the additional capital which they require for carrying out various authorized extensions and improvements. At the annual meeting of the Underground Electric Railways, London, Ltd. (the holding company), held on March 3, Lord Ashfield was even more optimistic as to the future.

Reorganization Plans Carried Out

In connection with the London General Omnibus Company it may be of interest to note the increased cost to the company of the recent transfer of taxation from petrol (gasoline) to the vehicles themselves. In 1920 the amount paid in petrol duty was £141,000, while police licenses for the omnibuses cost £17,000 in addition. For the present year the new taxes, which come in lieu of the petrol duty, have been paid to the amount of £229,000. As this tax is charged by the year, the figure mentioned represents the great bulk of the sum which was chargeable in 1921.

The associated London underground railway companies and omnibus and tramway companies have just carried out a reorganization of their administrative staff on very thorough and comprehensive lines. Lord Ashfield remains chairman and managing director of all these companies.

A remarkable expansion of traffic on the Great Northern & City Railway during recent years was mentioned by Lord Aberconway, chairman of the Metropolitan Railway, at the annual meeting on Feb. 10. The Metropolitan Railway, which is quite separate from the London "combine," and is partly a steam system, took over the Great Northern & City line, which is a tube railway, in 1913. Since then the number of passengers has increased by 75 per cent, and the fares now are nearly double those charged eight years ago.

Sir Eric to Retire

It was officially announced in the House of Commons on March 4 that in August next, when the period of state control of British railways comes to an end, Sir Eric Geddes, Minister of Transport, will retire from office. He is at present engaged in the important work of trying to come to a financial settlement with the companies before the railways are handed back to them, and very large sums are involved. Sir Eric who is not a politician, wished to retire some time ago, but was dissuaded by the Government, which values his services as a railway expert very highly.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Segregation Recommended

Citizens' Committee Wants the Railway Returned to Local Control —Court Urges Conference

The Citizens' Committee of Forty, with Hugh McCloskey, former president of the New Orleans Railways & Light Company, New Orleans, La., as chairman of the advisory committee, has submitted its findings on the utility matter to Judge Foster of the Federal District Court. It is a lengthy document. The report was indorsed by every member of the committee save one, Robley S. Stearns.

Among the recommendations made by the committee, which has been at work more than a month seeking to find a solution for the traction troubles of this city, are that the gas plant and the railway should be divorced, the city being given the option to acquire the railway plant. The committee disapproves the service-at-cost plan, but finds that it is impossible to operate the lines at a fare of less than 7½ cents under present conditions and recommends the issuance of railway tickets at the rate of ten for 75 cents.

RAILWAY WORTH $26,000,000

After considering the valuation placed upon the property of the New Orleans Railway & Light Company by the various experts who have been called in to estimate its worth the committee arrives at the conclusion that the railway proper is not worth more than $26,000,000; the light and power establishment $10,000,000 and the gas plant $8,500,000. Wide latitude is recommended in the readjustment of the franchises, tracks and schedules of the railway so as to insure more economical management and better service.

The committee says that the utility to be able to furnish adequate service should be put on a sound financial basis, and that the management should enjoy the confidence, respect and good will of the people of New Orleans. On this point it says:

> To accomplish this much-to-be-desired result your committee first of all recommends that steps be taken which will absolutely insure strictly New Orleans control and management, and will make it impossible for outsiders to gain control of the new corporation for the purpose of displacing the management and perhaps run the company for their own selfish ends, to the great injury of all the elements of our community.
>
> It will not be difficult to work out a plan which will prevent such a recurrence and the committee will be glad to submit its ideas on this subject in detail in due time. In the meantime we merely wish to suggest that five New Orleans citizens in whose integrity and judgment the public has absolute confidence should be selected as "trustees" charged with the duty of selecting and maintaining a reliable and efficient management for the reorganized company.

The minority report of Mr. Stearns holds that the underlying bonds, approximately $11,000,000, should be recognized dollar for dollar; that the $23,000,000 of other major securities should be recognized at what was paid for them; namely, about 80 cents on the dollar, and that the common and preferred stock, about $30,000,000, par value, should be considered lost by bad management.

Judge Foster invited the members of the Commission Council to meet him and representatives of the advisory committee on March 28 to try to formulate some definite plan of action looking to a solution of the trouble.

Frankford Elevated Operating Contract Up Again

The terms of operation of the Frankford elevated by the Philadelphia Rapid Transit Company are again up for consideration. It seemed probable that the matter would go before the Council on March 31.

Agreement appears to be general that a fare much higher than 5 cents would have to be charged if the road were run by the Philadelphia Rapid Transit Company separate from its other lines and that if the new line were tied in with the present system the rate of fare now in effect for the entire city would have to be increased slightly.

It has been indicated that the Philadelphia Rapid Transit Company, if it is to operate the new line, would want to put into effect at once an increase in its present fare, although the elevated line is not expected to be ready for service until about January, 1922. In this way it might be possible to accumulate a fund against the deficit in the operation of the elevated which is regarded as certain to follow when the line is placed in operation.

The attitude of the Philadelphia Rapid Transit Company on the matter is reflected unmistakably in a letter from President Mitten to the Mayor. Mr. Mitten said:

> Since our meeting of yesterday I feel that I should now state that, with the approval of the Public Service Commission, I am willing to undertake the added burden imposed by the Frankford "L" and Bustleton line, without increasing the basic fare of 7 cents cash, but with the change to five tickets for 35 cents instead of four tickets for 25 cents as now.
>
> Since the operation of the Frankford 'L' during 1921 is the goal toward which we have all long been striving I would suggest that the legal departments of the city and company make every effort to cut the red tape surrounding the awarding of construction contracts by the city, to the end that all possible construction work on Frankford "L" be turned over to P. R. T. for completion, so that its effective organization can be immediately directed to this accomplishment.

Nothing to Conceal

Indianapolis Company Resents Implication that It Tricked City in Fare Appeal

The Indianapolis Street Railway and the Citizens Gas Company are the only Indianapolis public service corporations which have franchise agreements with the city. Both of them have petitions for higher rates pending before the Public Service Commission. Both aver that emergencies exist which require relief, the 1913 public utility law authorizing the commission to act in emergency cases, regardless of franchises. Neither company, however, is affected by the Knapp law, passed by the last Legislature, in which opportunity to surrender franchises is afforded public service corporations.

The Knapp law will go into effect with the general promulgation of the 1921 acts, probably in May. After that time the Indianapolis companies may surrender their franchises and operate entirely under the commission. This fact, however, has thus far had no bearing on the relief petitions pending before the commission on the emergency basis. The emergency set out by the railway company is a cash deficit.

COMPANY ANSWERS THE CITY

A statement issued by Dr. Henry Jameson, chairman of the company board of directors, discussed the attitude of Samuel Ashby, corporation counsel, who has said the city will oppose the company's petition for increase in fares. Dr. Jameson's statement said in part:

> In the matter of the petition of the Indianapolis Street Railway to the Public Service Commission, filed on March 14, asking for needed relief in the matter of increased fares, Samuel Ashby, corporation counsel, makes the statement that he "has reports of the financial condition of the company up to a few months ago," thereby leaving the inference that he has been denied any information in recent months in regard to the company's financial situation. This implication is at once unfair to the company and unfair to the city. It has been the attitude of this company at all times cheerfully to furnish any and all information to the city and to the Public Service Commission in order that a broad and constructive policy might be followed for the benefit of not only the city but of the patrons of the company.
>
> Mr. Ashby further states that "the petition was filed without the knowledge of city officials." Mr. Ashby was present and represented the city in December on the petition of the company asking that a charge of 2 cents for transfers be authorized. Mr. Ashby was fully advised of all of these matters and fully represented the city and did not demur to this order.
>
> It is manifestly unfair and erroneous to attempt to create the impression that the company is attempting some action without the city's being fully advised. Personally, I wish to state that this company wishes at all times to keep the city fully advised and to act with it in a spirit that is friendly and constructive and will accomplish the purpose of securing not only better service, but much needed extensions.

Emergency Commission Bill Signed

Governor of New York Approves Measure Providing Relief from Intolerable Conditions in New York City

Governor Miller of New York on March 30 signed the so-called Knight-Adler bill creating a transit commission to take sole charge of New York City's transportation lines and reorganizing the Public Service Commission for the State. The new law became effective at once. There has been much speculation in regard to the selection of appointees to the new commissions, but it is not expected that the Governor will announce the names of the new commissioners for a week or ten days.

THE measure signed by the Governor is the result of the special message of the chief executive of the state to the Legislature on Jan. 24, relating to regulation of public utilities, with special attention to the urgent condition presented by the transit situation in the city of New York. The Governor declared the vital need was the creation of an agency to deal with public utilities with ample and undivided authority and responsibility.

The bill as passed consists of 124 printed pages. Provisions requiring special attention are, however, confined to comparatively few sections. The act amends the Public Service Commission Law, abolishes the Public Service Commissions for the First and Second Districts and the office of the Transit Construction Commissioner and establishes a single Public Service Commission of five members appointed by the Governor at a salary of $15,000 a year for ten years to have statewide jurisdiction embracing the same class of public utilities as are now under the jurisdiction of existing commissions.

PROVISION FOR EMERGENCY RATES

The act also creates a Transit Commission of three members for a term of five years with an annual salary of $15,000 to have jurisdiction within cities having a population of more than 1,000,000 (New York City), over railroads, street railroads and stage or omnibus lines lying exclusively or partially within such city, and "to such portions of any railroad as lies within such city and is used for local service and is not operated as part of a trunk line railroad."

In addition to all the regulatory powers possessed by the present commissions, both new commissions are given increased power for regulating rates, fares and charges of corporations coming within their respective jurisdictions—including holding companies. They are given power to determine "just and reasonable rates, fares and charges to be thereafter observed and in force as the maximum to be charged for the service to be performed, notwithstanding that a higher or lower rate, fare or charge has been heretofore prescribed by general or special statute, contract, grant, franchise, condition, consent or other agreement, and fix the same by order."

The new commisssions are empowered to order temporary increases or decreases in rates pending the final determination of rate cases before them. All these provisions for regulating rates and fixing temporary rates apply to gas and electric corporations, steam companies and telephone and telegraph companies as well as transportation companies.

In response to the Governor's suggestion that the foundation be laid for a completely unified system of transportation in the city of New York, Article VI is to be added to the Public Service Commission Law. The subject matter of this article directs the Transit Commission to prepare a plan of readjustment for the relief and improvement of transit with a view to "the combination, rehabilitation, improvement and extension of existing railroads," securing sufficient operating revenue on rapid transit lines to make the city's investment self-sustaining and take it out of the debt limit, and with the further view to "the readjustment of the existing rights and obligations of the railroad companies so that the real values in the railroads may be protected and the securities stabilized." The commission is also directed to "cause a valuation to be made of the physical property used in public service of the railroads it proposes to include" in such plan. Such valuation is to be made the basis for all allowances to the railroad companies under the plan. From the valuation so found there is no provision for appeal.

PUBLIC HEARING BEFORE ADOPTION

Procedure for the adoption of the new plan for relief for the companies in Greater New York as outlined in Section 107 of the bill calls for a public hearing before adoption. After adoption the plan must be submitted to the public authorities (Board of Estimate) for approval. This procedure would appear to be merely a matter of form, for if in the judgment of the commission there is justification for carrying out the plan, the commission is directed to proceed with the preparation of contracts, plans and specifications and such other action as may be necessary to carry it out, and "may in the name and in behalf of the city execute and deliver such contract or contracts with full legal force and effect as if all approval of the local authorities had been given," any law to the contrary notwithstanding. The right to accept or reject the program laid down by the commission is, however, made optional with the companies involved. It is to the provision of this section particularly that exception is taken by the city of New York, on the strength of its acknowledged investment of more than $300,000,000 in the present rapid transit lines.

The section empowering the commission to prepare a plan for the readjustment provides that the plan advanced by the commission shall contain provisions which in the judgment of the commission will accomplish as nearly as may be the following four main purposes:

1. The combination, rehabilitation improvement and extension of existing railroads so that service thereon may be increased and improved to the fullest extent possible.
2. The receipt by the city of sufficient returns from the operation of the railroads so that the corporate stock or bonds issued by the city for the construction of rapid transit railroads may be exempted in computing the debt incurring power of the city under the constitution of the state.
3. The readjustment of the existing rights and obligations of the railroad companies so that the real values in the railroads may be protected and securities stabilized.
4. The assuring to the people of the city the continued operation of the railroads at the present or lowest possible fares consistent with the just valuations of the railroads and their safe and economical operation.

Little Hope for Texas Utility Act

Municipal home rule representatives in the House of the Texas Legislature by incorporating in the proposed utility act many amendments injurious to utilities have forced proponents of the bill to kill it by striking out the enacting clause. This development leaves little hope for state utility relief until the next biennial session of the Legislature.

The bill was drafted by a committee appointed by the Governor and consisting of an equal number of representatives of municipalities, utilities, state commercial bodies, House of Representatives and Senate. The original draft of the bill as prepared by the representatives of the municipalities was very drastic on utilities. Many open hearings were held by the committee, however, and a greatly amended final draft was passed by a large majority of the committee, only the municipal representatives reporting adversely.

The measure then was introduced into the House and Senate and after being favorably reported in both Houses was passed by the Senate. It was held up in the House by municipal home rule representatives and so loaded with clauses inimical to the interests of public utilities that it became necessary to kill it.

Northwest Developing Vast Water Power Plans

With the Chicago, Milwaukee & St. Paul Railroad electrified over most of its Rocky Mountain-Pacific section, the Great Northern intimating it has additional electrification plans in mind and intense interest shown by other railroads in the prospective development of a large hydro-electric plant at Wallowa Rapids on the Columbia River, it would appear as if the days of coal in the Pacific Northwest were numbered as a main factor in major transportion. The Great Northern plans extensive development of its Chelan River plant, while the Washington Water Power Company, now supplying current to the Chicago, Milwaukee & St. Paul road, is developing an additional 15,000 hp. at Spokane and investigating the possibilities of power development at Kettle Falls, north of Spokane. The outlet for this additional power is undoubtedly the railroads, although no definite statement has been made.

In the passage at arms between Seattle and Portland anent recent rate adjustments from Inland Empire points to Portland the statement was made at Seattle that the rate was not justified as the Chicago, Milwaukee & St. Paul Railroad was now hauling freight to Seattle over the Cascade Mountains at a lower per ton cost than the Spokane, Portland & Seattle road could deliver commodities at Portland with water grade down the Columbia River for the entire distance. This would appear to be a most interesting commentary on the advantages of electricity as applied to major railroad operations.

Campaign Renewed for Jitneys on Broadway

The Broadway Association, New York has again raised the question as to whether the present electric railway on Broadway shall be replaced with lines of buses. This activity is similar to a move made by the association about a year ago. The questions submitted then, however, were confined to a referendum among the members of the association itself. The referendum vote is asked on these questions:

> Are you in favor of a through line operated from Bowling Green to Kingsbridge for a single fare without transfer?
>
> Are you in favor of the continued use of the present type of green car on Broadway south of Forty-fourth Street?
>
> Are you in favor of the removal of the street car tracks and the substitution of a modern bus system operating on Broadway?

The circular of the association says:

> Reliable information is that a bus line can be profitably operated on the entire length of Broadway in Manhattan for a single fare.

City Refuses to Stop One-Man Cars

Union labor organizations in the city of Sacramento, Cal., recently tried to get the City Commission there to refuse to allow the Pacific Gas & Electric Company to operate one-man cars in that city. They opposed the one-man car on the ground of safety. The company succeeded in proving that the one-man cars were not unsafe. The opposition then switched to the claim that the commission should rule the cars out on the ground of civic pride. Finally, the labor organizations came out in the open and admitted that their opposition to the cars was based on the belief of their being inimical to the best interest of labor. The measure was defeated thereupon by a vote of four to one. The State Legislature is now considering similar union labor measures to prohibit the use of one-man cars anywhere in the State.

Hot Campaign Closing in Detroit

Private Company and City Engaged in Frantic Effort to Win the Public Vote on April 4

With the approach of the election at Detroit, Mich., on April 4, when two questions pertaining to railway matters are to be placed on the ballot, the Detroit United Railway is urging the adoption of its service-at-cost ordinance as a means to settle the railway controversy in Detroit, while the Street Railway Commission is urging the people to approve the purchase by the city of about 25 miles of Detroit United Railway lines.

THE D. U. R. has been conducting a campaign to educate the voters as to the provisions of the company's ordinance, using newspaper advertising and street car posters, fostering public discussions and sending copies of the proposed ordinance to each registered voter in the city. *Electric Railway Service*, the company's weekly publication, has also devoted considerable space each week to analyzing the company's proposed ordinance.

FOUR MAIN POINTS CONSIDERED

F. W. Brooks, president of the Detroit United Railway, is quoting Delos F. Wilcox's pamphlet "Flexible Fares" against Mr. Wilcox. Mr. Brooks states that the Detroit plan has been patterned after the Cleveland plan with such additions and improvements as in the years of Cleveland experience, have been found necessary to improve the measure. He further maintains that every minor fault that Mr. Wilcox has ever expressed in print with the Cleveland plan has been corrected in the Detroit service-at-cost plan, and that in Detroit as in Cleveland, service-at-cost means peace and order instead of strife and chaos.

On the other hand the city officials have sent out to the voters a pamphlet containing an official report to Mayor Couzens by Delos F. Wilcox, analyzing what is termed "The D. U. R. Square Deal Service-at-Cost Franchise." It is stated in the pamphlet over the signature of Mayor Couzens that the services of Mr. Wilcox were secured that the citizens might get the best possible analysis of the Detroit United Railway plan by a neutral authority.

CHIEF OBJECTIONS OUTLINED

A summary of what appears to Mr. Wilcox to be the chief defects of the ordinance from the public point of view enumerates: granting a thirty-year blanket franchise; highest valuation for the company property; no-limit fare; appeal to the courts wiped out; premium on inefficiency; Detroit United Railway wrote its own contract; possibility of abrogation of the terms of the contract through legislation or action of the State Utilities Commission without the city's consent.

The city's pamphlet also summarizes briefly a number of undesirable features of the service-at-cost ordinance pointed out by the Corporation Counsel, and after reviewing briefly the progress made by the Street Railway Commission since April 5 last, when the $15,000,000 bond issue was approved by the people, explains the provisions of the city's purchase plan. The purchase plan is stated to be a progressive step in carrying out the municipal ownership plan approved by a 63 per cent vote of the people last April. The lines in question will be purchased with money derived from the original bond issue and additional funds are not required.

Several suits involving the city and the Detroit United Railway are still pending, among which is the action brought by the Detroit United Railway against certain city officials involved, for contempt of court in not obeying the temporary restraining order against the city crossing the Mack Avenue line with the tracks of the St. Jean line of the Municipal Railway. John A. Mercier, the contractor who constructed the first stretch of municipal roadbed last year, has brought suit against the Street Railway Commission to prevent the city from going ahead with construction work with its own forces on a stretch of line where Mr. Mercier holds the contract to do the excavating and to lay the concrete bed. A different type of construction is now being used by the Street Railway Commission and the contractor refused to change his contract to conform with the new specifications. Considerable money can be saved by changing to the new type of construction, Joseph S. Goodwin, manager of the municipal lines, believes.

Taxpayers' Suit Heard

Arguments on the motion of the fourteen taxpayers to dismiss the Stone & Webster suit to enjoin them from making the Puget Sound Power & Light Company a party to their suit against the city of Seattle, in the matter of disposition of funds of the Seattle Municipal Railway, were completed recently in Judge Jeremiah Neterer's Court, along with arguments on the company's plea for an injunction against the taxpayers. Judge Neterer reserved decision in the action of the company against the taxpayers.

Attorneys for the traction interests sought to show that the taxpayers contemplated an attack on the special fund created in the contract for payment of bond interest and principal. He asked whether the court would shut the door on the company and make it take its chances on what would happen on Sept. 1, when the next interest payment is due, and on March 1, when $833,000 of the principal is due as well. Attorneys for the taxpayers denied that any breach of contract was sought, but that the action was simply taken to protect the city's general fund.

43 per Cent Wage Reduction

Company at Davenport Unable Longer to Stand High Wages, Jitney Competition and Political Opposition

Unable longer to bear the brunt of unregulated jitney operation, high wages and continued political opposition from a Socialist City Council, the Tri-City Railway, Davenport, Iowa, on March 25, notified employees on the Iowa lines that a 43 per cent reduction in wages would go into effect on April 1. The new scale for trainmen will be: Men under six months, 36 cents an hour; men over six months and less than one year, 38 cents an hour; men one year or over in company employ, 40 cents an hour; shop and carhouse men, 40 cents maximum.

The present scale carries a 70-cent maximum and has been in force since June 1 last. It was negotiated under the condition that the company receive sufficient fare to pay the increase in wage. It was agreed on following arbitration.

Since that time the City Council in Davenport has refused to allow the company to install one-man cars, has threatened an increase in taxation and has repeatedly refused to increase fares, the traction lines finally being forced to go into court and secure by injunction a 9-cent fare, with three tickets for a quarter. This fare has, however, been greatly discounted by unregulated taxi and jitney competition.

The railway recently went into court and secured an injunction against forty-six of the jitney buses which were violating the city ordinances and which the Socialist City Attorney refused to stop.

UNION CHIEF DISCHARGED

The president of the local union of railway employees made a speech at the City Council attacking one-man cars, a speech which is regarded as largely instrumental in the defeat of this plan of operation. The union head also criticised company discipline and was discharged as a result of a statement the company declares was untrue.

Members of the City Council asked the head of the union to apologize to President B. J. Denman of the traction lines, but he refused to do this and a strike vote followed by the Davenport, Rock Island and Moline trainmen. No date was set for a strike but negotiations have so far proved fruitless. In the face of this situation the company has announced the reduction in wages.

The men, in the effort to secure the reinstatement of their deposed chief, have invoked state arbitration through Governor N. E. Kendall of Iowa under a law of 1913. This law makes investigation of the case at issue by an arbitration board compulsory on the petition of more than twenty-five disinterested parties. The Governor has notified the company and the trainmen to select five names each, from which he will appoint two arbiters, these two to select a third.

The finding of the board, however, is not compulsory unless both sides to the controversy agree to accept its decision and the Tri-City Railway has signified unofficially that it will not accept this decision as it does not consider the discharge of a man on the ground of disloyalty as a subject to be arbitrated.

The company, however, has evinced a disposition to arbitrate the new 40-cent wage scale, but not on the basis of the present 70-cent scale. The company will likewise refuse to agree to accept the finding of an arbitration board on a wage scale if it considers the finding of the board in terms of wages beyond its financial ability to pay.

Massachusetts Strike Threat

Amalgamated Regards Retrenchment Program of Eastern Massachusetts as Attempt to Crush Union

Reply has been made by the Amalgamated Association at Boston, Mass., through Counsel Vahey to the notification issued on Feb. 25 by the trustees of the Eastern Massachusetts Street Railway that at the expiration of the existing wage and working agreement on May 1, a reduction of 20 per cent in wages would go into effect. The trustees further stated that they desired and intended to cancel the entire agreement at that time, and that their letter should be construed as an official notification of that intention in accordance with the terms of the agreement as to changes, amendments or continuation.

Formal action on the matter was not taken before on account of the absence of Mr. Vahey from Boston. After reviewing the situation Mr. Vahey issued a lengthy statement to the papers denying the right of the trustees to cancel the agreement in its entirety and charging an attempt to disrupt and break up the union. Mr. Vahey takes the stand that the trustees are distinctly antagonistic and unfair to organized labor and that they have taken an arbitrary and unwarranted stand in the present instance, in refusing to arbitrate the matter. He intimates such action may cause the men to strike.

As a matter of fact the trustees have not made any statement relative to what position they will take should arbitration be suggested or demanded. Their attitude is that the public is demanding lower fares and the biggest obstacle to any fare reduction is the present wage scale.

Letters have been sent by the trustees to the local "Home Rule Committees" of citizens in the various cities and towns served by the company, inviting them to meet the trustees to discuss the expected reductions in wages and to express their opinion and discuss as to the best means of passing along the reduction to the public. It is the announced intention of the trustees to return to the public every dollar saved by wage reductions, either by equivalent reductions in fares, improved service or both. In all their published statements the trustees are standing squarely on the issue that lower fares for car-riders hinge on lower rates of wages.

The accompanying comparison of hourly wages of the various classes of employees in 1915 and 1920 has been issued by the trustees.

The trustees have received a petition for the restoration of service in Gloucester, Mass. Service there was suspended nearly a year ago as the lines did not earn expenses and the city authorities failed to agree to make up the deficit by taxation. This latest petition is of especial interest as it was signed by some of the former employees who have been out of work since the cars ceased to run. These men have now expressed their willingness to work at the reduced rate of wages which the trustees have announced to go into effect on May 2, on the entire system.

Officials of the union have denied that the Gloucester men would work at the proposed wage scale, but the trustees have the petition bearing the signatures of a number of the men.

COMPARISON OF WAGES OF EASTERN MASSACHUSETTS STREET RAILWAY EMPLOYEES

	Cents per Hour			
	1915	1920	Increase	Per Cent
Conductors and motormen	26.83	62.00 *66.74	35.17 39.91	131.1 148.7
Car cleaners	21.89	58.00	36.11	164.9
Watchmen	18.38	58.00	39.62	215.4
Armature winders	28.24	63.00	34.76	123.1
Pitmen	24.80	61.00	36.20	156.5
Machinists	27.62	63.00	35.38	128.1
Carpenters	28.88	62.00	33.12	114.7
General helpers	20.72	58.00	37.28	179.9
Trackmen	22.2	58.00	35.8	138.8
Firemen	27.76	66.00	38.24	137.7
Oilers	25.93	62.00	36.07	139.1
Assistant engineers	33.76	76.00	42.24	125.1

*Operators of one-man cars.

Jersey Jitneys Jolted

Following a prolonged debate the Senate of New Jersey by a vote of twelve to three has passed the measure regulating jitneys and placing their operation in certain particulars under the jurisdiction of the Public Utility Commission. The bill, effective from March 15, does not affect jitneys in operation prior to that date.

News Notes

City Road Made All-American. — Twenty-five employees on the Seattle (Wash.) Municipal Railway who have not become American citizens will be removed from the payroll and supplanted by citizens.

Wage Settlement Expected.—No decision had been reached up to March 29 on the wage contracts submitted by the carmen's union to the Community Traction Company, the successor to the railway property of the Toledo Railways & Light Company, Toledo, Ohio.

Texas Line Reduces Wages.—The Wichita Falls (Tex.) Traction Company has announced a reduction of 11 per cent in wages of conductors and motormen, the cut to be effective from March 15. Decreased revenue is assigned as the cause. The trainmen have accepted the wage cut.

Bill Against Expenditures for Publicity.—A bill was introduced in the Assembly of New York on March 8 by Mr. Antin adding new section 230a to the Public Service Commissions Law, providing that no expenditure for publicity purposes by any corporation subject to jurisdiction of Public Service or Transit Commission shall be allowed as an element in fixing fares or charges.

City Sues to Recover for Paving.—The city of Danbury, Conn., has filed a suit to recover $18,000 damages from the Danbury & Bethel Traction Company due to the fact that the city was forced to pay for the paving of the tracks of the railway last year because the company did not have enough funds to carry out the work. Corporation Counsel Samuel A. Davis has filed complaint in the Superior Court at Bridgeport in the interest of the city.

Mayors Opposed to Traction Measure.—A measure has recently been introduced in the Legislature by Assemblyman George D. Brady, Buffalo, which would vest in the Public Service Commission power to regulate the amount of pavement costs to be paid by traction companies regardless of agreements between companies and municipalities in which they operate. The State Conference of Mayors cited thirty-one reasons in opposition to the bill.

Brooklyn Lines Assessed Too High.—The Brooklyn City Railroad, the Prospect Park & Coney Island Railroad, the North Beach Railroad and several other Brooklyn surface and elevated lines were granted recently by Justice Manning in the Supreme Court a writ of certiorari requiring the State Tax Commission to show cause in Albany on May 9 why the franchise assessment of the lines should not be reduced. The total amount of the assessment is $39,077,930, which the lines contend is $13,704,132 too much.

Chamber of Commerce Plans Railway Survey.—A plan for a special committee of five men to make a survey of the operating and financial conditions of the Pittsburgh (Pa.) Railways, with a view to assisting the company to better local conditions, was adopted by the Chamber of Commerce of Pittsburgh on March 16. The resolution asking for the appointment of the committee was sponsored by the chamber's regular committee on municipal affairs and approved by the board of directors.

Bills Still Being Introduced.—Considerable legislation continues to be introduced in the Indiana General Assembly affecting interurban lines. A bill passed the House recently by unanimous vote empowering the Public Service Commission to prescribe headlight regulations for interurban cars. A strong attempt was made on the part of enemies of public utilities to pass the Harris House bill, which would compel electric railways whose lines cross those of steam roads to pay for the upkeep of the crossing on a wheelage basis. The bill has been indefinitely postponed. This kills it so far as the present session is concerned.

Railway Employees to Hold Reunion. A reunion of all employees of the Massachusetts Northeastern Street Railway, Haverhill, Mass., will take place at Canobie Lake Park, Salem, N. H., on May 20, for the benefit of the mutual relief fund of the company. This Mutual Relief Association is an incorporation formed for the purpose of furnishing death benefits and relief to ill and disabled employee members of the association. During the past season the association paid out more than $1,700 in sick and death benefits and all efforts will be made to raise this amount in the spring meeting.

Electrical Workers Return.—After a strike of sixteen days, the electrical workers, including linemen and substation operators of the British Columbia Electric Railway at Vancouver and Victoria have returned to work. The dispute was over wages. The company rejected the award of a conciliation board on the ground that its decision was based on conditions last August and offered a 10 per cent reduction. The deadlock was broken by the company granting the men their requests and signing up an agreement on the basis of the award. During the strike, the light, power and railway service was maintained by the substations being operated by office employees of the company.

Indictments Dismissed. — Supreme Court Justice Edward Lazansky has dismissed the indictment against officials of the Brooklyn (N. Y.) Rapid Transit Company, which were secured following the Malbone Street tunnel wreck in 1918. In the accident more than ninety people were killed and several hundred were injured. The officials of the road from the motorman to the general manager were indicted but no convictions were secured. District Attorney H. E. Lewis, on whose motion the indictments were dismissed, stated to the court that in view of the circumstances as to the evidence and the great expense attached to the trials he did not feel justified in again bringing the men to court.

Active Year for Safety League.—The Ontario Safety League, Toronto, Canada, recently published a statement reviewing its activities and accomplishments for the year 1920. In an effort to prevent accidents the league has carried on an intensive and extensive campaign throughout the province of Ontario. By the distribution of bulletins, circulars, leaflets, etc., and by means of conferences, posters, motion pictures and lantern slides, the appeal has reached practically every city and town in Ontario. The most notable activity of the year was a three-day safety convention in April last, at which important papers were read and discussed by representatives of industry from Ontario, Quebec, Nova Scotia and Manitoba. This convention together with a "Safety Week" drive in October had far-reaching effects.

Des Moines Railway Starts Advertising Campaign.—Homer A. Miller and F. C. Chambers, receivers for the Des Moines (Ia.) City Railway, have started an advertising campaign to acquaint the car riders of that city with the comparison between the general good done in Des Moines by the company and its competitor, the motor bus. Every day during the week ended March 26 an advertisement appeared in all of the city dailies, each message being devoted to some particular side of the question in the war between the railway and the buses. In addition to the newspaper advertising letters have been mailed to a large number of business men of the city to give them a better understanding of the actual situation.

Perpetual Franchise Upheld. — An opinion was handed down by Judge A. M. J. Cochran in the United States District Court at Covington, Ky., during the week ended March 26, in which he held that the South Covington & Cincinnati Street Railway has a perpetual franchise on certain streets in Fort Thomas, Ky., and that an ordinance is void that was passed by the Board of Trustees of Fort Thomas on Feb. 16, 1917, by which it was sought to compel the company to pay rentals on Mt. Pleasant, Dundee and Highland Avenues. The suit was filed by the railway against the town of Fort Thomas three years ago, seeking an injunction to prevent the collection of rentals on the thoroughfares mentioned. Judge Cochran held the certain grants made by the Highland Park Land Company were legal and that the company had installed tracks on some of the streets before they were used as thoroughfares in the town of Fort Thomas.

Financial and Corporate

P. S. Net Falls

Passenger Revenue and Traffic Increase of 15 per Cent Fails to Offset Increased Costs

According to the twelfth annual report of the Public Service Railway, Newark, N. J., for the year ended Dec. 31, 1920, the company did not earn sufficient to meet operating expenses and fixed charges excluding any amount for amortization and depreciation.

In speaking of rates the report said that the efforts to secure a rate adequate to requirements have, broadly speaking, been practically continuous since early in March, 1918, when the first application was filed with the Public Utility Commission.

INCOME STATISTICS—PUBLIC SERVICE RAILWAY

	1920	1919	Per Cent Change
Passenger revenue	$26,200,000	$22,600,000	+15.9
Operating revenue	27,881,990	24,146,251	+15.5
Non-operating income	108,706	71,774	+51.4
Gross revenue	27,990,696	24,212,025	+15.0
Operating expenses and taxes	$23,548,878	$19,624,065	+20.0

TRAFFIC STATISTICS—PUBLIC SERVICE RAILWAY

	1920	1919	Per Cent Change
Miles of line	538.173	539,031	— 0.16
Miles of revenue track	851.390	852,310	— 0.11
Total revenue per mile of line	$52,000	$43,100	+20.5
Total revenue per mile of revenue track	$32,900	$27,250	+20.7
Revenue passengers	363,757,587	(a) 327,619,606	+11.0
Transfers and passes	89,777,107	69,069,628	+30.0
Total passengers	453,534,694	396,689,234	+14.3
Percentage of passengers using transfers	17.7	15.4	(b) + 2.3
Average fare per passenger (cents)	5.79	5.71	+ 1.4
Car-mileage	60,798,743	57,644,927	+ 5.5
Car-hours	6,539,207	6,039,453	+ 8.2
Passengers carried per day	1,239,166	1,086,820	+14.1
Passenger receipts per car-mile (cents)	43.21	39.29	+10.0
Per car-hour	$4.02	$3.75	+ 7.2
Ratio car-miles to car-hours	9.30	9.54	(b) — 0.24
Estimated population served	2,423,225	2,125,356	+14.0
Rides per capita	187	186.5	+ 0.27

(a) Mile zone system in effect Sept. 14 to Dec. 7, 1919.
(b) Difference.

The 1919 report expressed the hope that there remained but the presentation of certain testimony collected by the commission as to real estate values, summing up by counsel, and decisions by the commission to fix the value of the company's property. The last formal hearing in the case was held on Feb. 26, 1920, and a reasonably prompt decision was generally expected, but certain circumstances intervened to prevent.

The Legislature of New Jersey, the report goes on to say, in response to a well-defined public demand for an independent valuation of street railway property, passed an act which became effective May 5, 1920, creating a special commission of state officials authorized to appoint a firm of engineers to appraise the properties of any or all of the street railway companies in the state. The act provides that the valuation of a property so determined is to be accepted as evidence by the Public Utility Commission in its determination of a reasonable rate for that company.

Subsequent to the passing of this act the Public Utility Commission took no further action in the matter of fixing the value of the railway's property. Pursuant to the act, Ford, Bacon & Davis, New York, were selected to make the valuation. Work was undertaken about Aug. 1 and the valuation is expected to be completed very soon.

On Dec. 7, 1920, the railway filed with the Public Utility Commission a schedule of rates calling for a 10-cent fare with free transfer, to be effective Jan. 1, 1921. This rate was suspended by the utility commission pending hearings, but the removal of the commissioners made hearings impossible. With the appointment of a new commission and the completion of the valuation of the company's property an early determination is expected.

Notwithstanding former trying experiences, the year 1920 was one of the most difficult. During more than three months weather conditions made operation not only difficult but expensive. By the use of all its facilities and almost superhuman efforts on the part of the operating force during the severe storms, the lines were kept in operation, reflecting great credit on the personnel and a most favorable comparison between this and other systems operating in large communities where many sections were not operated for a considerable period after such storms. Again, during the outlaw strike of steam railroad labor in the spring of 1920 commutation train service on practically all railroads was suspended and the burden of transporting commuters from the northern part of the state to the several ferries reaching New York City was handled by the railway in a way that merited general commendation.

The labor situation during the greater part of the year was a difficult one, not only on account of shortage by reason of the higher rates paid by other industries, so that on May 1 the company advanced the pay of trainmen 5 cents per hour and made corresponding increases in other departments.

To provide improved service, particularly on lines of light traffic, by giving a shorter headway with more economically operated equipment, 200 safety cars which can be operated by one man were adopted. On Sept. 5, 1920, the first regular service with this type of car was started on the Riverside line in Paterson. By the close of the year seventeen lines in Passaic, central division, had been equipped with these cars, the service of which is satisfactory and fully up to expectations. In order to accommodate the dense traffic on heavy city lines, where the small safety car is unsuitable, the trailer type of car was adopted. At the close of the year only one of the 100 ordered had been received. This has been tried on a number of different lines and operates in a very satisfactory manner.

In order to provide better facilities for coping with snow troubles, fifteen double truck snow plows and sixteen single truck snow sweepers were also contracted for during the year.

During the year 18.97 miles of track was reconstructed of new rail and 4.102 miles with same rail. Track extensions built during the year totaled 1.468 miles. The total trackage of the system now is 897.721 miles.

The ferries operated by the company from Edgewater and Bergen Point showed substantial increase in business during the year. During labor troubles in New York Harbor, however, the ferry employees of this company remained loyal and service was not interrupted from that cause.

The cost of claims against the railway including expenses of administration during the year was $1,276,846.46, or 4.9 per cent of the gross receipts. Notwithstanding the increased number of vehicular accidents due to the large use of motor vehicles, the figures compare favorably with the previous year in which the cost amounted to 5.3 per cent of the gross receipts.

Statistics as to operation are presented in the accompanying tables.

La Fayette Company Organizes

The La Fayette Service Company, La Fayette, Ind., which some time ago took over the La Fayette section of the Fort Wayne & Northern Indiana Traction Company, has announced its permanent organization as follows: President, Walter L. Haehnlen, Philadelphia, Pa.; vice-president, Clyde W. Reed, Fort Wayne, Ind.; secretary-treasurer and general manager, R. W. Levering, La Fayette, Ind.

Franchise Abrogation Bill Seems to Be Doomed

Abrogation of the perpetual franchises enjoyed by the Columbus Railway, Power & Light Company, on certain streets of Columbus, Ohio, proposed in the bill introduced by Senator J. F. Atwood of Columbus, seems very unlikely as the result of the action of the Ohio Senate last week in sending the bill back to another committee.

The measure has been reported out by the committee on cities with recommendation for passage, but when it came up on the calendar for passage a determined attack upon it by Cleveland and Cincinnati Senators resulted in its being referred to the public utilities committee, which is said to be anything but friendly to the measure. In view of the vote in favor of recommitment the possibility of the bill coming out now seems very doubtful.

Opposition on the part of the Cincinnati and Cleveland solons is due to the fact that many citizens and institutions in those cities own stock and hold bonds of the Columbus Railway, Power & Light Company, which would be still further depreciated if the future of the company and its credit are made insecure by repeal of the perpetual franchises.

Senator Atwood introduced the bill at the request of a group of Columbus citizens interested in making it possible for the city to obtain terms from the company when the present blanket franchise expires in 1926. Only by legislative action can the perpetual franchises held on streets other than those covered by the blanket franchise be terminated, and it is charged that undisturbed retention of the franchises gives the company a hold in Columbus detrimental to the interests of the citizens.

Charles L. Kurtz, president of the Columbus Company, told the Senate committee on cities, by which the bill was reported for passage, that enactment of the Atwood bill would handicap the company in its effort to refinance itself; that investors will cease to buy securities if informed that all franchises are to end in a few years, and that the company would face uncertainty in getting a new grant in 1926.

Indiana Company Sells Stock Direct to Public

Some time ago Harry Reid, president of the Interstate Public Service Company, Indianapolis, Ind., decided to offer an issue of the 7 per cent prior lien stock to patrons of the interurban gas and light properties operated by the company. In commenting on the success of the offering Mr. Reid said:

> In spite of the fact that the money market has been described as tight, and stocks and bonds generally have not been absorbed as rapidly as in normal times we have sold approximately $500,000 of our 7 per cent prior lien stock. The people of this State have money to invest and will put it in sound, profitable investments.
>
> Our company naturally is pleased to find that its customers have enough faith in it to place some of their savings on surplus funds with us. It makes them partners in the enterprise. It seems to me that this partnership relation will be beneficial both to the company and to its patrons. The public utility business is really the people's business, anyhow, and the closer the relationship between the companies and the people the better it will be for both.

The Interstate Company handled this issue through its own employees, selling the stock at par at its branch offices.

1920 a Profitable Year in Charlottesville

The Charlottesville & Albemarle Railway, operating in Charlottesville, Va., was one of the few public utility companies operating railways as a part of their system that paid both preferred and common stock dividends in 1920. This is favorable indeed in view of the fact that the company is still operating on a 5-cent fare on its 3.5 mile line. With the hope of costs decreasing it was decided to continue at the old rate, and make every effort to increase patronage. The accompanying illustration shows the company's appeal for new patrons. The railway's report for the year just ended is also good in view of the fact that lighting and power rates have only been increased to cover the rise in the cost of coal. During the year $30,925 was spent for permanent improvements, the largest expense being for two combustion Engineering Corporation's heavy duty type "E" automatic stokers. The income statement for the past two years follows:

UNIVERSITY
USE THE STREET CARS FARE 5 CENTS.

BIDDING FOR TRAFFIC IN CHARLOTTESVILLE

INCOME ACCOUNT — CHARLOTTESVILLE & ALBEMARLE RAILWAY

Item	1920	1919	Per Cent Change
Operating Revenues:			
Railway..........	$60,226	$50,957	18.2
Light and power.....	138,003	102,054	35.2
Total.............	$198,229	$153,011	29.5
Operating Expenses:			
Railway............	$42,755	$35,977	18.8
Light and power.....	67,999	43,183	57.6
Depreciation........	20,000	....	....
Total............	$130,754	$79,160	65.3
Net revenue from operation..............	$67,475	$73,851	— 8.6
Non-operating income..	634	761	—16.7
Gross income........	$68,109	$74,612	— 8.7
Fixed charges.......	35,499	33,115	7.2
Net corporate income	$32,610	$41,497	—21.4
Dividends on pf. stk..	8,589	8,589	......
Dividends on cm. stk.	15,000	25,000	—40.0
Surplus..........	$9,021	$79,08	14.1

Net Income of $103,736 in East St. Louis

A 4 per cent dividend, totaling $77,600, has been declared by the East St. Louis (Ill.) Railway on the company's capital stock of $1,940,000, according to an announcement by W. H. Sawyer, president of the company. This is the largest dividend the company has voted in several years. The road is controlled by the East St. Louis & Suburban Railway.

A financial statement presented at the annual meeting and made public by Mr. Sawyer shows that the net income of the East St. Louis Railway during 1920 was $103,736. The balance remaining after the payment of the 4 per cent dividend will be added to the credit balance of the company, making the total $235,514. The statement follows:

INCOME ACCOUNT OF THE EAST ST. LOUIS RAILWAY

Operating revenues		$1,182,704
Operating expenses, depreciation, etc.		941,051
		$241,653
Taxes		45,000
Operating income		$196,653
Deductions:		
Interest on bonds..	$98,470.00	
Miscellaneous interest, discounts, etc.	3,422.28	
		101,892
		$94,760
Non-operating income		8,975
Net income		$103,736

According to Mr. Sawyer the operating income of the company was approximately the figure that the Illinois Public Utilities Commission had fixed, the losses for the first few months of the year before the 8-cent fare became effective having been made up in the closing months. The commission had placed $195,000 as a fair income for the East St. Louis Railway after paying operating expenses, depreciation, power and other rentals.

This is the first time that a statement of this kind has been made public. Mr. Sawyer said that he expected the revenues of the company in 1921 would be in the neighborhood of last year's total, pointing out that the recent cut the Public Utilities Commission has ordered in fare would probably result in showing an increase the first part of the year over the corresponding period of 1920, but that the closing months would see a reduction as compared with the previous year.

New Interurban Contracts Being Negotiated

Wilfred Cann, street railway commissioner, and Frank R. Coates, president of the Community Traction Company, Toledo, Ohio, conferred with twenty representatives of interurbans entering the city in a preliminary meeting on Feb. 12 in the matter of new contracts for use of city tracks at Toledo.

The Milner ordinance provides that the interurbans could use the streets on the terms of old contracts only until new ones could be negotiated. The contracts are subject to arbitration.

The Toledo & Western Railroad, through its receivers, has asked the Public Utilities Commission to allow it to take Toledo off its tariff and substitute West Toledo for it, so that fare changes within the city limits could be adjusted to local conditions without the filing of a new petition and tariff every time the fare changed in the city limits. The company seeks in the petition to make its city fare agree with the 6-cent rate of the Community Traction Company, by March 14.

It is thought that this will be the course of action of practically all of the interurban lines entering the city. They will be regulated by tariff only to the city limits and then by contract adopt the city fares to agree with those set in the Milner ordinance.

The Toledo, Ottawa Beach & Northern Railway, one of the remaining Doherty lines at Toledo, has also filed a tariff making its city fare agree with the Community lines and increasing its fare to Toledo Beach, Mich., by 5 cents.

Financial News Notes

Back Coupons and Interest Paid.—Jan. 1, 1921, coupons on the New Orleans Railway & Light Company, general mortgage 4½ per cent bonds will be paid on and after March 31, 1921, upon presentation at the office of the New York Trust Company, N. Y., or the Hibernia Bank & Trust Company, New Orleans, La. In addition to the face amount of the coupons 28 cents interest thereon will be paid.

Sales of Roads Under Foreclosure Directed.—Judge Cummings at Sunbury, Pa., on March 18 directed the sale of the Sunbury & Selinsgrove Electric Railroad, the Sunbury, Milton & Lewisburg Railroad and the Chillisquaque Connecting Railroad, which have been in receivers' hands for more than seven years. The order of sale of the three properties was made to satisfy mortgage bond claims of more than $600,000, upon which interest is in default.

Valuation Protested.—A hearing to determine the validity of the valuation of the property of the Fargo-Moorhead Street Railway, Fargo, N. D., as ascertained by the State Railroad Commission, will be held on April 18. Notice of the hearing was filed with the City Commission on March 16 by the State Railroad Commission. According to this notice the railway recently protested against the valuation of its property as fixed by the commission.

Fewer Passengers in Toledo.—According to Street Railway Commissioner Cann there were 5,000 fewer daily electric railway passengers in Toledo, Ohio, in the month of March. He believes the decrease is due to the industrial depression which is now beginning to have its effect in the supply of ready money citizens have on hand. The Community Traction Company will report a deficit for March, it is estimated, of more than $75,000 as compared with a deficit of $58,000 for the previous month.

Appeal of City for Co-receiver Denied.—Declaring that if he later considers it advisable to appoint a co-receiver to represent the city's interest he will do so, Judge H. H. Watkins, at Anderson, S. C., on March 19 announced that he will leave the affairs of the South Carolina Light, Power & Railway Company, Spartanburg, S. C., temporarily at least, in the hands of George B. Tripp, vice-president and general manager of the company, and J. B. Lee, a director of the corporation, who were appointed receivers on Feb. 17.

Cable Cars Put on a Car-Mile Basis.—The United Railroads, San Francisco, Cal., has about 14 miles of cable railroad which will probably never be electrified because the grades range up to 19.8 per cent. In figuring up the earnings on this cable system, it is interesting to note that the cable cars show average earnings per car mile of 47 cents compared with 36 cents for the electric lines, but on the basis of car-hour earnings, the cable lines average $3.26 whereas the electric lines average $3.35. The explanation lies in the fact that the cable lines operate over comparatively short routes at slow speeds, averaging only about 6½ m.p.h.

Berkshire Company Faces Receivership.—Receivership for the Berkshire Street Railway, Pittsfield, Mass., is inevitable unless legislative relief is granted immediately, L. S. Storrs, vice-president of the company, told the legislative committee on street railways sitting in Pittsfield. The road operates 75 miles of tracks in Berkshire County. The New York, New Haven & Hartford Railroad, which owns stock, has put $6,000,000 in the property. According to the figures presented by Mr. Storrs the company's deficit last year was $100,000 and it now owes $94,000 for taxes, $40,000 for fuel and other essentials and has only $15,000 on hand. The parent company is willing to sell the property at a state appraised valuation and have it run by trustees like the Boston Elevated Railway.

Only $42,265 Earned to Meet Charges.—The Dallas (Tex.) Railway reports a gross income of $262,675 for the month of February, 1921, while the operating revenue for the same period was $220,410, not including interest on bonds, stocks, notes, commissions or discounts on loans or costs of raising money, rental on the Oak Cliff lines owned by the Northern Texas Traction Company, or dividends on stocks, which leaves a balance earned for return on the investment of $42,265. These figures are given in the financial statement submitted to the supervisor of public utilities covering the month of February and the forty-one months under which the company has been operating under the present franchise. The earnings of the company are set forth in detail in a statement which has been published in all the newspapers of Dallas as a display advertisement.

Property of United Railroads Sold.—The United Railroads, San Francisco, Cal., was sold to Frank D. Madison, attorney for the reorganization commottee, at receiver's sale on March 21 for $7,000,000. Mr. Madison, representing the committee, which consists of Frank B. Anderson, William H. Crocker, Herbert Fleishhacker, E. S. Heller and John D. McKee, submitted the only bid. The sale practically completes the long labors of the reorganization committee. Mr. Madison said after the sale that only about 2 per cent of the United Railroads 4s remained undeposited, and that practically all the Sutter Street Railroad & Omnibus Cable Railway bondholders had agreed to the reorganization plan. The successor company will be known as the Market Street Railway. The terms of the reorganization have been reviewed at length previously in the ELECTRIC RAILWAY JOURNAL.

City Protests Expenses of Receivership.—Formal objections to the inclusion of receivership expenses in the cost of the New York Municipal Railway Corporation under its contract with the city have been filed by Transit Construction Commissioner John H. Delaney with Receiver Lindley M. Garrison and also with Daniel L. Turner, chief engineer to the Transit Construction Commission, whose duty it is to determine the propriety of construction costs. Up to Dec. 31, 1920, the receivership expenses aggregated $472,380, of which $274,035 was allotted to the rapid transit lines and the remainder to the surface lines which do not come under the contract with the city. The commissioner objects especially to the inclusion of the compensation and allowances for disbursements by the receiver which amounted to $174,999 and to similar payments for his solicitor Karl M. Owen, $7,945.

Return of Equipment Sought.—The General Electric Company has become one of the intervenors in the Des Moines (Ia.) City Railway case. It demands $68,466 from the railway. The suit is brought to intervene in the action by the North American Construction Company. The company seeks to protect its investment in equipment which it has furnished to the Des Moines City Railway. The action is based upon sixteen promissory notes and five contracts signed by officers of the Des Moines City Railway during 1918. In its petition the General Electric Company asks that the federal court recognize the ownership of the equipment in the General Electric Company because of stipulations to that effect in the contract between that company and the railway. If the money is not paid within sixty days the General Electric Company asks a court order directing the Des Moines City Railway to return the equipment.

Traffic and Transportation

Mr. Dana Talks on Spreads

Boston Elevated Railway Explains to Men Difficulty of Eight Hours in Ten

The bulletin for March of the Boston Elevated Railway to its men is devoted to the question of spreads. The four previous bulletins of the company to its men cover principally the questions of earnings and expenses of the property for the previous months.

The question of spread came up on the property through a legislative bill (later abandoned) calling for eight hours in ten. The Boston Elevated schedules are made up on the eight-hour basis, but under the "cover" system, as described by Mr. Dana in an article on page 647 of the issue of this paper for Oct. 2, 1920.

The text of the March bulletin is reproduced below with the diagram which accompanied it:

> Operation during the month of February resulted in income exceeding expenses by $2,887.29.
>
> The severe storm of the twentieth made the problem more difficult but will in no way affect our determination to meet the outstanding deficit by July 1, 1921.
>
> The present working conditions on this railway are probably not equalled on any railway in this country. In view of the fact that an 8 in 10-hour law has been suggested it is of value to study its effect upon the problem of providing street railway transportation.
>
> The accompanying diagram shows the number of trips operated on this system during each hour of the day.
>
> At the present time car service men complete their work with outside hours as follows:
>
> 27% within 8 hours
> 33% within 9 hours
> 58% within 10 hours
> 71% within 11 hours
> 78% within 12 hours
> 88% within 13 hours
> 100% within 14 hours
>
> This arrangement, in addition to an eight-hour guarantee which amounts to time not actually required in service, to $600,000 per year, permits all trips being arranged in runs, and the small per cent required to cover both rush hour peaks meets the service requirements of our business.
>
> The line drawn across the chart represents a ten-hour spread and indicates clearly that men operating morning rush hour trips would not be available for afternoon rush hour trips, and consequently more men would be required.
>
> It would require 1,300 more men to operate the system under such a restriction of outside time, and cost the car riders over two millions of dollars.
>
> If the eight-hour guarantee remained under such a plan the new men could only be of actual service one-fourth of their time, and the balance of the time would constitute a heavy burden upon the car riders.
>
> If the guarantee were not continued men who could only secure one-fourth of a day's work could not be held in the service, and a constant change of personnel would occur, which would likewise be a severe burden upon the car riders.
>
> We are co-operating in the common interests of the car riders, and ought to be familiar with facts such as these.
>
> Co-operation means securing all the revenue, avoiding accidents, being considerate of car riders, helping one another, conserving supplies and materials and not wasting time.

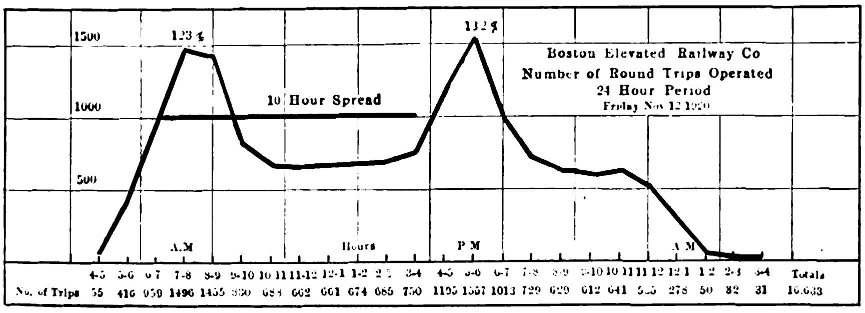


DIAGRAM IN CIRCULAR ISSUED BY BOSTON ELEVATED

Eight-Cent Rate Temporary Solution

The existing rate of fare in the District of Columbia—8 cents, or four tokens for 30 cents—was ordered continued until Aug. 31 by the Public Utilities Commission in an opinion handed down on March 28. Efforts have been made to secure a reduction in the rate of fare. The Capital Traction Company did not ask for a continuation of the existing fare, but stated that a return to the 5-cent fare would not allow it a fair return. It was shown, evidently to the satisfaction of the commission, that the Washington Railway & Electric Company could not secure a proper return on less than the existing rate.

The commission apparently hopes Congress will pass the necessary legislation to permit the merging into a single organization of the two traction companies and the Potomac Electric Power Company.

Extraordinary Service and Extraordinary Mayor

In announcing his candidacy for renomination to the office he has filled for the last three years Mayor Charles R. Hunter of Terre Haute, Ind., told of things accomplished during his term of office. Among these points was the following:

> The traction company did its part toward making the necessary repairs along the line of its tracks, except for a strip along Wabash Avenue, which will be attended to this spring. * * * Although our people may not realize it we have as good a street car system as there is to be found in the country, and in the face of raising of fares all over the country our people ride at 5 cents. In other cities the fare has been advanced to 7, 8, 9 and 10 cents. Our people save thousands of dollars every year on fares alone.

Twenty per Cent Advance

Utah Road Allowed New Rates, but Refused Return on Appreciation in Value

One-way passenger fares on the Salt Lake & Utah Railroad, the "Orem Road," between Salt Lake City and Payson, Utah, are permitted to be increased 20 per cent by the Public Utilities Commission of Utah in a decision handed down on March 18.

COMMUTATION NOT INCREASED

Round-trip tickets, for which a 20 per cent increase was asked, are permitted to be increased 1.8 per cent of one-way fare. One thousand mile books are increased from 2¼ cents to 2½ cents a mile. No increase is allowed in 500-mile books, commutation tickets or school tickets. The application of the company was filed on Nov. 24, 1920. In it the company asked for a flat increase of 20 per cent on all its rates.

The Orem line at the hearing set up that its actual construction costs, incurred from 1913 to 1917, showed a book value of the property of $4,823,096. It sought to capitalize appreciations in value which have occurred during the war period. These, it was claimed, would enhance the value of the road by approximately 75 per cent, or $3,239,675. The company further sought to include in its investment $1,300,864 as "developmental cost," thus asserting the right to a fair return on a total cost of $9,363,635, as compared with the book value of the property of considerably less than $5,000,000.

WAR TIME VALUATION NOT ACCEPTED

These claims of the company the commission dismissed with the following comment:

> The commission is not inclined to accept in full a valuation based upon the maxims of war prices applied to property that was constructed and placed in operation before the war prices took effect. This is not intended to exclude consideration of such prices. On the contrary present reproduction cost undoubtedly is one element entering into the present fair value of property, but it is only one element and not necessarily controlling.
>
> Nor does the commission, in passing upon the question here involved, accept at this time as final the statement of book values presented by the petitioner as hereinbefore referred to. Such reference to the figures as has been made is intended merely to indicate that the financial condition of the petitioner is such that under this petition and for the purpose of passing upon the question involved it is not necessary to enter minutely into a consideration of the construction costs.

It was shown that the company had been unable to set up any depreciation reserve for the reason that the net income has not been sufficient to provide for depreciation on all of the property, and that heavy maintenance demands must be met by the railroad company within the next few years from current revenue.

Calculated on the 1920 volume of business it is estimated by the commission that the advances granted will increase the gross revenue of the company by $6,000 a month. This is a sum about 20 per cent less than the increase asked by the railroad in its petition.

Electric and Steam Lines Before I. C. C.

Common Issue Made by Railroads in Missouri and Kansas to Prevent Rate Discriminations

The Joplin & Pittsburg Railway, the Kansas City, Kaw Valley & Western Railway and the Arkansas Valley Interurban Railway have asked the Interstate Commerce Commission to adjust their intrastate rates to the interstate basis, and to join the electric road interests with those of steam railroads now pending before the commission. The cases were heard before an examiner of the Interstate Commerce Commission at Topeka on March 24. There will be a final hearing at Washington during April.

IN the case now coming from Kansas careful preparation has been made to establish all the facts in such a way that the analogy between electric and steam road circumstances may be plain. The situation has vital interest for the several electric railways in the Kansas City district, since neither the Missouri nor the Kansas State Commission has raised intrastate steam road rates to coincide with interstate rates fixed by the Interstate Commission.

Parallels Steam Railway Case

The fact that Clyde Taylor, who prepared the present case for the Joplin & Pittsburg Railway, is also representing the Kansas City, Kaw Valley & Western Railway, has provided a valuable element in the construction of principles of interstate service by electric interurbans. The lines and service of the former are largely interstate; while the lines of the latter are intrastate, but its service largely interstate.

The third party to the present proceedings is the Arkansas Valley Interurban Railway, operating electric lines serving Wichita, Newton and Hutchinson, all within the State of Kansas.

The proceedings relative to the petition of the Joplin & Pittsburg Railway offer the broadest picture of the claim of electric roads to Interstate Commerce Commission intervention. This company operates 104 miles of standard gage road, the chief terminals being Joplin, in Missouri, and Pittsburg, in Kansas. It transports freight and passengers both in state and interstate commerce, files its tariffs with the state and federal commissions, has joint tariffs with the principal trunk lines, competes in both interstate and intrastate passenger and freight business with the Frisco, Southern, Missouri Pacific and Katy railroads. Its situation is therefore exactly the same as that of steam railroads whose intrastate rates, when discriminatory, the Interstate Commerce Commission adjusts in view of interstate rates.

The passenger rate of this company, in Kansas, was increased on March 4, 1920, to 3 cents per mile, and in Missouri was increased on Aug. 1, 1920, to 3 cents per mile. On Sept. 24, 1920, the company filed a passenger rate schedule of 3.6 cents per mile on interstate traffic with the Interstate Commerce Commission, and collected this rate on interstate passenger traffic thereafter. The present proceedings pertain chiefly to passenger rates, but the freight rate discriminations are also displayed. On Aug. 26, 1920, the interstate freight rates were advanced on this road 35 per cent, and on Nov. 1, 1920, the Kansas freight rate advanced 30 per cent.

When the time came to seek the intervention of the Interstate Commerce Commission concerning readjustment of state rates, it was necessary to show (1) that the intrastate rates were discriminatory, and (2) that the interstate rates, the higher, were reasonable.

The electric line's passenger rate of 3.6 cents was the result of a schedule without hearing upon its reasonableness and hence it did not constitute *prima facie* evidence that the interstate rate was reasonable. While it might appear upon the face of the evidence, therefore, that there was discrimination because of different intrastate and interstate rates, there was need to show definitely that the adverse discrimination was due to inequity of the state rates.

Road's Valuation Studied

The first steps in the present matter, therefore, were similar to those in rate hearings. Before the examiner in Topeka, were brought reports and evidences of the road's valuation, costs of operation and earnings. The low net earnings under the 3-cent intrastate rates were demonstrated, and the increase of earnings on interstate business under the higher interstate rate were also shown. The displays demonstrated that over the period during which the 3.6-cent interstate rates prevailed, the company's net earnings on interstate passenger business were small—much below fair return on approved valuation.

It was shown also that had the rates within Kansas and Missouri been equal to interstate rates during the whole period the returns net, would have been inadequate—assuming that the higher rate would not have reduced patronage. This evidence demonstrated the fairness and indeed the necessity of a 3.6-cent rate for intra and interstate traffic, and directly upheld the premise that the 3.6 interstate rate was reasonable. The evidence as to discrimination, therefore, put the burden of the discrimination on the unjustly low state rate. Many instances were advanced to show discrimination. Mr. Taylor proved that not only does the difference between the intrastate and interstate passenger rates cause discrimination against interstate business, but it enables the actual interstate passenger to defeat, in part, the interstate rate.

The electric railways are, in these proceedings, coming before the Interstate Commerce Commission on exactly the same footing as steam roads. Indeed, the whole subject now is presented as one matter, the electric and the steam lines being associated in the presentation. Attorneys for the two classes of transportation are cooperating and jointly preparing the cases and the issues are joined before the commission in the effort to secure a needed adjustment of rates for railroads, whether electric or steam, in cases where discrimination exists and is shown to exist. The proceedings are entitled "in the discrimination of Kansas intrastate passenger and freight rates and charges as against interstate rates and charges," I. C. C. No. 11916.

Fare Increase Suspended

New Jersey Road Must Quit Unless Adequate Relief Is Secured Through Increased Rates

Proposed collection of 10-cent fares in 142 municipalities in which the Public Service Railway operates in New Jersey was suspended on March 29, for a further period of three months by the new Public Utility Commission. This action was taken after Thomas N. McCarter, president of the Public Service Corporation, had testified before the commission that unless adequate relief is provided by increased revenues the Public Service Railway must go out of business. Mr. McCarter said:

> Public Service Railway would have been in the hands of a receiver long ago but for the fact that its stock is held by Public Service Corporation, which has been paying its deficit and keeping it alive. At the end of last year when the railway presented its application for increased rates, the situation had become most acute. The company's funds and credit had been exhausted and Public Service Corporation, in justice to its other underlying companies (Public Service Gas and Public Service Electric) was no longer in position "to hold the bag."

When the hearing began on March 29 Governor Edwards had not yet signed the bill passed the night before in the Senate giving the new commission power to suspend increased rates for a further period of three months. Therefore, the board was confronted by the alternative of terminating the hearing within three days or permitting the increase to become effective automatically. Governor Edwards, however, signed the bill during the afternoon, whereupon the board continued the previous order of suspension, which expired on April 1, and adjourned the hearing until April 7 when it will be resumed in Newark.

Mr. McCarter was the only witness examined. He said the actual loss sustained by the railway, during the last three years, including the shortage in the depreciation account fixed by the board, amounted to $3,700,000. He contended that instead of allowing $800,000 a year for depreciation the amount should be not less than $1,200,000. The company, he said, should expend immediately $2,000,000, representing the accrued shortage in its renewal account plus the whole sum allowed for depreciation for the present year.

Public Service Railway, Mr. McCarter said, carried 363,000,000 cash paying passengers last year. He estimated that with a 10-cent fare this number would be decreased by 50,000,000 during the present year.

As estimated by Mr. McCarter the cost of operation for 1921, including $1,200,000 for current amortization and $600,000 in part payment of the shortage in depreciation, will amount to $30,000,000. He estimated that a 10-cent fare will yield a revenue of $31,000,000. He explained that experience has shown a 40 per cent increase in rates results in a 15 per cent increase in revenue due to the fact that rate increases decrease the number of riders.

With jitney competition eliminated Mr. McCarter thought it would be possible to exist with a 10-cent fare for casual riders, including a free transfer, and an 8⅓-cent ticket fare.

Mr. McCarter said that since 1917 wages have increased from $6,250,000 to $13,500,000; the cost of coal from $3.50 to $8.25 a ton delivered at the power station; taxes were raised $2,700,000 last year with a further increase in prospect, and steel rails have practically doubled in price. These four big items, he said, tell the story.

One-Man Cars in Syracuse and Utica

One-man cars have been adopted for use by the New York State Railways on its Utica and Syracuse lines as a retrenchment policy, pending the granting of a fare increase by the Public Service Commission, for both cities. The one-man operation has been adopted on diverse types of cars, the first attempt to change the system being made on the Blandina Street line in Utica, a light traffic line, where single-truck cars had always been used. The single-truck cars were continued in operation, passengers entering by the front door and paying fares upon entrance.

Finding that this policy was successful and met with the co-operation of the public the South Street and Eagle Street lines in Utica were changed to one-man operation. Peter Witt model and J. G. Brill pay-as-you-enter type cars were used on these lines, passengers entering by the front door only.

In Utica passengers outbound from the downtown districts, pay as they leave while passengers inbound pay as they enter. Thus far such a policy has met with success. B. N. Tilton, vice-president and general manager of the concern, states that the one-man cars have been put on to stay.

In Syracuse the one-man cars were introduced on the Green Street line, a route lightly patronized where single-truck cars are operated. Five of the Syracuse city lines are designated for early conversion into one-man type service cars. Several of the lines are to be consolidated while one will be re-routed to make a shorter route in response to the petitions of patrons.

Transportation News Notes

New Transfer System Postponed.—The new transfer system on the Los Angeles (Cal.) Railway planned to be put into effect on April 3 has been postponed until May 1. The details of the transfer scheme were given in the ELECTRIC RAILWAY JOURNAL issue of March 19.

Needs Increased Fares.—The Southern Pacific Company has filed application with the Public Service Commission for permission to increase fares on its Oregon lines in the cities of Salem, Eugene, Springfield and West Linn. Advances sufficient to yield a 7 per cent return on the investment are asked.

Wants Seven Cents a Zone.—The Frankford, Tacony & Holmesburg Railway, Philadelphia, at a recent hearing before Public Service Commissioner Clement, petitioned for a 7-cent zone fare. The company alleges that it will not be able to continue service between Frankford and Torresdale unless a fare increase is permitted.

Complaint Against Six-Cent Fare Dismissed.—The Public Service Commission at Harrisburg has established a valuation of $1,300,000 for the properties of the Shamokin & Mount Carmel Transit Company, which operates in Mount Carmel, Pa., and has dismissed complaints against a 6-cent fare established in 1918. Subsequently the War Labor Board allowed a 7-cent fare.

Fare Rise Suspended.—The Public Service Commission has suspended until July 16 the 10-cent fare schedule sought by the St. Joseph Railway, Light & Power Company, St. Joseph, Mo. The advance was to have gone into effect on March 18. The present rate of two fares for 13 cents will remain in force unless in the meantime the commission should decide favorably on the railway's application.

Jitneys Barred Outside City.—As a result of a new law passed in the recent Legislature no stage lines or jitneys can be operated outside the city of Spokane, Wash., without a certificate of necessity issued by the State Public Service Commission. Stage lines now in operation within the city are not included in the new ruling. Jitneys were ruled off the streets of Spokane almost three years ago.

Jitney Business Thrives.—During the past few months several jitney buses have started operating along the principal streets in Evansville, Ind. For several years there was only one bus in the city. It was run from Main Street to Washington Avenue. Now in addition to the regular jitneys several buses meet the factory workers and haul them to their homes. The large number of jitneys now in operation is due largely to the fact that so many men out of employment find this a way of making a fair living.

Fare Increase Suspended.—The Board of Public Utility Commission has notified the Trenton & Mercer County Traction Corporation, Trenton, N. J., that it cannot put the proposed 10-cent fare into effect until May 28, unless the board in the meantime favorably disposes of the company's application, which has been pending since November. This company will make application to the Supreme Court for a review of the suspension order and the judicial determination of the right of the utility board to grant a suspension for six months.

Council Rejects Six-Cent Fare.—The City Council of Akron, Ohio, has denied the petition of the Northern Ohio Traction & Light Company for a flat 6-cent cash fare. The traction company forwarded a communication to the Council recently stating that it was losing money on a 5-cent fare, the rate now in effect on the city lines. The emergency 5-cent cash fare ordinance passed by the Council expires on April 1. The company has indicated it wants a 7-cent cash fare from April 1 until a new franchise for the city lines is passed by the council and accepted by the company.

Non-Stop Interurban Service Advertised.—The Puget Sound Electric Railway, operating an electric interurban between Seattle and Tacoma, Wash., has undertaken a campaign of advertising in both Seattle and Tacoma daily newspapers, calling attention to the "Interurban Flier," non-stop between the two cities, starting on March 21, with round-trip fare of $1. The advertisements urge that shoppers in both cities watch the daily advertising of merchants in the local papers, and plan their purchases accordingly. The company is making a strong effort to build up this "Shoppers' Special Train," and to increase traffic between the two cities.

Power Rates Too High.—At a recent hearing on the Dallas Railway's application for a 7-cent fare it was brought out that the railway would have made more than its 7 per cent return during the last six months of 1920 if fuel oil had been bought at its present price of $1.50 a bbl. In connection with its power rates the Board of Commissioners has requested the Dallas Power & Light Company to appear at a meeting to consider power rates now in effect and the proposed new schedule which the light company has declared it will charge the Dallas Railway in the future. The Mayor has requested a full expense report from the railway showing what return the company probably will make in 1921 on a 6-cent fare and what return on a 7-cent fare. He has said that everything will be done to expedite the hearings of both utilities so that the city may reach a decision in the near future.

Personal Mention

J. P. Pulliam, President

Railway Executive Chosen to Head Wisconsin Electrical Association for Ensuing Year

J. P. Pulliam, who for several years has served as secretary of the Wisconsin Electrical Association, was elected president at the annual meeting in Milwaukee on March 24. Mr. Pulliam takes the place of W. C. Lounsbury, general manager of the Superior Water, Light & Power Company, Superior, Wis. Mr. Pulliam is vice-president of the Wisconsin Public Service Company, of the Evanston (Ill.) Railway, and vice-president and general manager of the Wisconsin Railway, Light & Power Company.

Mr. Pulliam became connected with the electric railway field after a number of years' experience in steam railway work with the Louisville Southern Railway at Louisville, Ky., and with the Choctaw & Oklahoma Railway Company at Shawnee, Okla. Later he engaged in commercial pursuits for a year and then served as trainmaster for the Grand Rapids, Grand Haven & Muskegon Railway for three years. He left that company to become superintendent of the Winnebago Traction Company, Oshkosh, Wis.

When the Wisconsin Electric Railway purchased the Winnebago Traction Company in 1908 Mr. Pulliam served the former company and the Eastern Wisconsin Railway & Light Company as general superintendent. He was later given a similar position with the same company in Fond du Lac, Wis. In 1917 he was elected vice-president and placed in charge of the operation of the Wisconsin Public Service Company, continuing in this position to date.

John Whitsell Assumes Managership of Winnipeg Railway

John Whitsell, whose appointment as operating manager of the Winnipeg (Man.) Electric Railway was announced in the ELECTRIC RAILWAY JOURNAL a short time ago, assumed his new duties on March 15.

He began his career in the electric railway industry in 1891 when he entered the car service department of the Sioux City Traction Company, Iowa, now known as the Sioux City Service Company. In 1897 Mr. Whitsell went to work for the Suburban Railroad, Chicago, as a shopman, later advancing to master mechanic, and then to superintendent in 1900. In 1912 he became superintendent of equipment and general superintendent of transportation of the County Traction Company, Chicago, which, the following year, was combined with the Suburban Railroad to make the Chicago & West Towns Railway, of which he became general superintendent. In May, 1920, he was made general superintendent of the Chicago & Interurban Traction Company, which position he left to go to Winnipeg.

V. B. Phillips, Consultant

Assistant to Vice-President of Cleveland Railways Joins Mr. Crecelius in Engineering Firm

Victor B. Phillips has resigned as assistant to the vice-president and as acting superintendent of power of the Cleveland (Ohio) Railway to become associated with L. P. Crecelius in the firm of Crecelius & Phillips, consulting, constructing and operating engineers. The resignation of Mr. Crecelius as superintendent of power of the Cleveland Railways was announced in these columns on Jan. 22.

V. B. PHILLIPS

Mr. Phillips has been associated with the Cleveland Railway since 1911. He is a graduate of Cornell University with the degree of mechanical engineer.

Immediately after the outbreak of the war Mr. Phillips joined the army and served with the rank of captain in the 113th Engineers. After the armistice he was attached to the American Commission to negotiate peace, first in connection with the valuation of war damages, and later with Bernard M. Baruch, economic adviser to the commission. From April to September, 1919, Mr. Phillips served with the United States Liquidation Commission in Paris and had charge of disposing of surplus army stocks.

At the present time he is serving as expert on the American Committee on Electrolysis and is a member of the engineering executive committee of the National Safety Council. Papers and articles by Mr. Phillips on electric railway and power subjects have appeared frequently in society transactions and in the technical journals.

The firm of Crecelius & Phillips will engage in general engineering practice. At the present time the firm is acting as engineers for several electric railway and public utility companies.

Promotions on Interurban

H. G. Hardin Made Superintendent and H. A. Otis His Assistant on Chicago Road

Harry G. Hardin and Harold A. Otis have been appointed general superintendent and assistant general superintendent, respectively, of the Chicago & Interurban Traction Company, Chicago, upon the order of Britton I. Budd, president of the company. Mr. Hardin has been with the elevated railways in Chicago for nearly twenty years, having begun this service on Oct. 4, 1901, as a trainman with the Metropolitan West Side Elevated Railway. During the following ten years he worked up through the train and yard service and in 1911 was appointed superintendent of transportation of the Chicago & Oak Park Elevated Railroad. He served in this capacity until April, 1920, when he was brought into the main office of the elevated companies as an assistant to M. J. Feron, general superintendent of transportation. He served in this office until his recent appointment in immediate charge of the Chicago & Interurban Traction Company, an interurban line connecting Chicago with Kankakee, Ill.

Mr. Otis began his work with the railways as a night electrician for the South Side Elevated Railroad after his graduation in 1912 from the electrical engineering department of the University of Illinois. In September of that year he was transferred to the office of superintendent of equipment of the several elevated railways. He has been engaged in the engineering and operating department since that time, his jurisdiction in mechanical matters having been extended lately to include the Chicago-Kankakee interurban.

N. H. Brown Resigns from New Orleans Railways

Nelson H. Brown, superintendent of transportation of the New Orleans Railway & Light Company, New Orleans, La., has resigned and A. B. Paterson has been appointed acting general superintendent in his stead. Mr. Paterson comes from Meridian, Miss., and became identified with the New Orleans Railway & Light Company last July as special engineer for General Manager A. L. Kempster. He was formerly with the Henry L. Doherty interests and has had about seventeen years' experience in the public utility business.

Mr. Brown went to New Orleans from Buffalo, where he was general superintendent of the International Railway. He has had an extensive experience in railway service, having been connected previously with the street railways of Syracuse, Worcester and Albany.

H. M. Platt has recently been appointed editor of the N. E. L. A. *Bulletin* and assistant to the director of publicity. Mr. Platt was at one time on the editorial staff of the ELECTRIC RAILWAY JOURNAL, having previously been in the business department of the McGraw Publishing Company as a field representative on several of its publications.

F. E. Schornstein, formerly local manager at Red Wood, Minn., of the Wisconsin-Minnesota Light & Power Company, has been made district manager for the same company at Eau Claire, Wis., in charge of the local street railway system in Eau Claire and Chippawa Falls and the interurban line connecting these two cities and Altoona.

V. Chisholm has resigned his position as superintendent of the railway department of the Knox County Electric Company, Rockland, Me., after having served thirty years in the railway department of that company. Charles E. Gregory, who has been in charge of the operation of the power station equipment at Rockland for several years, has been appointed to fill the vacancy. Mr. Gregory will have full charge of the railway department and power station equipment.

R. L. Ellis has been appointed manager of the Miami Beach Electric Company's new $250,000 plant which furnishes Miami Beach, Fla., with its light, and power for both industrial and railway use. Mr. Ellis was formerly with the Birmingham Railway, Light & Power Company, Birmingham, Ala., and previous to that was connected with the Selma (Ala.) Electric Railway Company. After making a complete survey of the transportation situation, Mr. Ellis has recommended a ten-minute schedule between Miami and Miami Beach and has taken steps toward the procuring of additional rolling stock to permit maintaining that schedule and building up adequate and efficient service.

Benjamin F. Cleaves, chairman of the Maine Public Utilities Commission since its establishment in 1914, has tendered his resignation to take up the management of the Associated Industries of Maine, with headquarters at Augusta. Chairman Cleaves is a native of Waterboro, Me., and was graduated from the Biddeford High School in 1885. He read law in the offices of Hamilton & Haley, was admitted to the bar in 1892, and practiced law at Biddeford thenceforth, ultimately becoming a member of the firm of Cleaves, Waterhouse & Emery. With the establishment of the Maine commission he sought to create an understanding between the utilities, the public and the commission which was peculiarly adapted to the conditions prevalent in Maine and which has borne fruit in a regulation of marked breadth of view, straightforward action and a sane and sympathetic realization of the problems of public utility service and financing.

Statue to Railway Founder

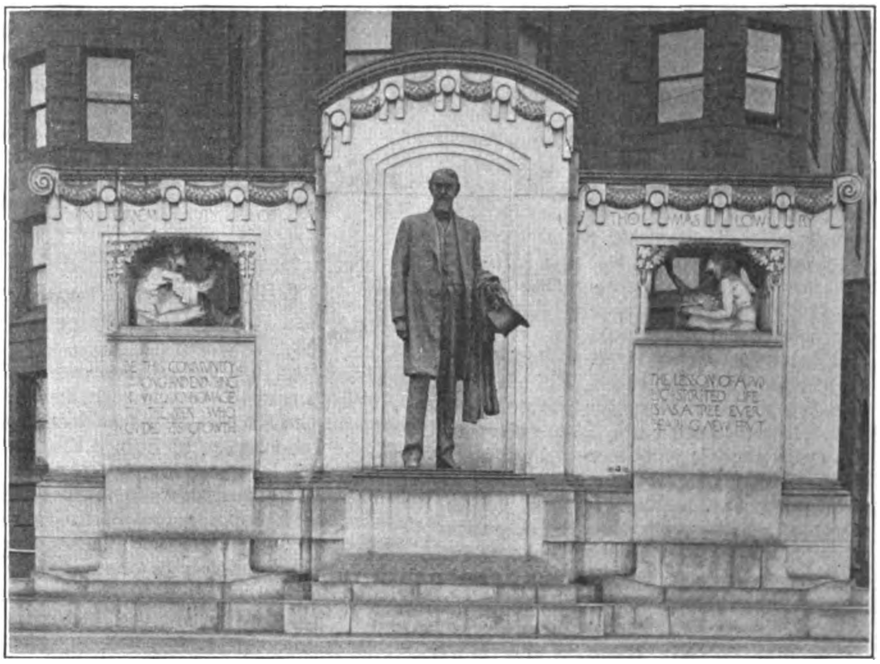
Permanent Memorial Erected in Minneapolis to Founder of Present Twin City Rapid Transit Company

Few electric railway men who knew Thomas Lowry of Minneapolis, Minn., and cherish recollections of him are perhaps acquainted with the fact that a monument by Karl Bitter has been erected to the memory of the founder of the Twin City Rapid Transit Company. The bronze statue stands in Virginia Triangle, Minneapolis, at the intersection of Hennepin and Lyndale Avenues. It was unveiled on Aug. 18, 1915, and presented to the city by the Lowry Memorial Association, formed among Mr. Lowry's friends and associates shortly after his death on Feb. 4, 1909.

"Tom" Lowry was born Feb. 27, 1843, on a farm in Logan County, Ill. He was admitted to the bar in 1867. The same year he opened a law office in Minneapolis and a few years later was made judge of the Hennepin County Court of Common Pleas. After the panic of 1873 Mr. Lowry turned his attention to the struggling street railway in Minneapolis, with which he was afterward continuously connected, at first as vice-president and later, when the systems in Minneapolis and St. Paul were consolidated, as president. In the early days of the American Electric Railway Association Mr. Lowry took a very active interest in its affairs and in 1890 was elected president of the association.

He was very popular, especially in the Twin Cities. One of the newspapers in eulogy of Mr. Lowry said editorially: "No man envied his wealth, for it was well earned and well spent. If for nothing else, he was remarkable for making his traction company the most popular institution in two great cities. To this his own unaffected modesty and high personal character largely contributed."

The accompanying illustration of the memorial is published through the courtesy of the Minneapolis *Journal.*



MEMORIAL TO "TOM" LOWRY, FOUNDER OF TWIN CITY RAPID TRANSIT

Obituary

J. B. Robbins, at one time superintendent of the Chattanooga Railway & Light Company, Chattanooga, Tenn., died on March 16 in St. Paul, Minn. Mr. Robbins began business as a railroad contractor. He was also a business associate of the late C. G. Goodrich, president of the Twin City Rapid Transit Company. Mr. Robbins was born in Kentucky in 1862.

Benjamin B. Lawrence, mining engineer and a director of the Washington Water Power Company, Spokane, Wash., and of other corporations, is dead. Mr. Lawrence was graduated from the School of Mines, Columbia University, in 1878. He went West and engaged in gold and silver mining in the Gilpin district of Colorado. Returning to New York he established an office as a consulting engineer.

Samuel T. Murdock of Indianapolis, who has been prominent in the promotion of Indiana's traction lines, died on March 21 after a week's illness. Mr. Murdock was secretary of both the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, South Bend, Ind. He was also interested in the Union Traction Company of Indiana, Anderson, and had been recently named as a director of that company. Mr. Murdock was fifty-three years old.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Good Supply of Track Bolts, Nuts and Spikes

Prices Are from Twenty to Forty per Cent Below Peak—Buying Mostly for Repairs

Producers of railroad spikes, bolts and nuts have accumulated a reasonable reserve supply sufficient to make deliveries of all standard material from stock, but there is a growing tendency to curtail production. This is natural in view of the light demand, and large jobbers who sell to railroads are also keeping their supplies down as low as they consistently can. Although there seems to be nothing tangible on which to base expectations of still greater price declines in this line producers report that consumers are apparently entertaining such hopes. The reduction from peak prices of spikes and bolts to date has been considerable, ranging from about 20 to 40 per cent with different companies, and in a representative instance amounting to $12 to $15 a ton on spikes and $20 to $30 per ton on bolts and nuts.

Producers are of course hopeful of improvement in demand, though they see few signs of it in the present market. Steam railroads last fall gave every indication of heavy buying of track material this spring and in fact did enter the market in fair volume the first of the year. This buying came nearly all at one time, however, and then petered out. For the past six weeks there has been very little activity either in the foreign or domestic field, and to date there is not much indication that railways will do more than repair roadbeds this year.

The current base price of track bolts and nuts is about 5 cents in car lots and 6 cents in lesser quantities, while standard railroad spikes are 3.65 cents and 4.65 cents by the same differentiation.

Immediate Deliveries of Track Tools

Manufacturers Differ Over Prospect for Demand Improving—Stocks Held to Low Levels

In view of present market conditions both manufacturers and jobbers of track tools such as picks, shovels, etc., report that they are keeping stocks low. Some companies, however, still have a considerable supply of high-priced goods on their hands on which it has been necessary to take a loss. In general immediate deliveries are made. The reduction from peak prices reported by different producers ranges from 10 to 30 per cent, though for some time the market has held steady. There seems to be some feeling of uneasiness in the trade regarding steel quotations, and the possibility of lower prices is perhaps a contributing factor in keeping both stocks and buying at low levels.

Some producers are optimistic over a return of fairly good business before the year is out, others are not. On the one hand it is pointed out that through such factors as the payment of money owed by the government to steam roads, the inauguration of wage cuts and higher rates for many electric lines, some hope of improvement is offered. On the other hand, it is stated that railways in general apparently have no money, that steam roads have in large part already expended the payments that are anticipated from the government and that the last half of the year will be too late for manufacturers in this line to receive good orders.

Thus far in 1921 it seems that the railroads of the country, both steam and electric, are going to buy only such track tools as are actually needed for necessary repairs, and even these in light volume. The foreign market is off, too, though there is quite a strong demand reported from South America and a large potential demand undoubtedly exists in Europe. Exchange rates are prohibitive as they affect the placing of orders in this country, however, and foreign competition is keen.

Justification of Present Prices Up to Manufacturer, Say Railways

Reduction of Prices Would Stimulate Buying, Is General View—Willingness of Producers to Take Losses on Stocks of High-Priced Material Is Questioned

Since the views of representative manufacturers of electric railway equipment on the subject of prices were published in the issues of Feb. 5 and 12, a number of letters have been received from electric railway officials. These letters differ with some of the points that producers make and present new evidence, in addition to that contained in the Feb. 26 number, as to how traction companies generally regard the question of price reductions on electric railway material.

The general tenor of the replies of the electric railways that were heard from appears to be that the burden of proof should rest upon the manufacturer as to why greater reductions in price are not made. There is also a decided feeling in many cases that prices of railway material are still out of line with lowered costs. Such items as steel, ties, wheels, track material, paints and varnish, overhead material, air and electrical car equipment, power station and substation equipment are among the things that are specifically mentioned.

Unwillingness of some manufacturers to take losses upon stocks of high-priced material is mentioned by more than one electric railway as the cause of prices being maintained. An official of a representative Middle-Western traction company believes that manufacturers in this field made large profits during the period of rising prices and now, if well organized, should be able to take some losses. This is the only way to relieve the present stagnated condition of the market, he thinks. A purchasing agent for another property corroborates this view and states that electric railways are trying to place as near normal orders as they can where manufacturers have shown a willingness to take losses the same as has been done in other industries. Where producers have held out for prevailing high prices, however, this company is following a policy of curtailing purchases to the lowest possible level commensurate with absolute needs.

The practice of maintaining railway equipment prices where possible finds some defense from the president of an electric railway in the East, however. This official believes in a policy of buyer versus seller, and if a manufacturer is able to obtain business sees no reason why prices should philanthropically be cut. He goes on to say, however, that some manufacturers are undoubtedly displaying poor judgment in not passing lowered costs on to the consumer as a means of increasing present low demand.

Manufacturers in general, as stated in previous issues, have questioned whether price cutting would stimulate buying to any extent. The buying end of the industry is by no means agreed over this point either, but judging by reports received from several representative railway officials greater buying would undoubtedly follow decided price reductions.

These men report that extensions in some instances are being held back awaiting lowered costs, and that consumers would stock more goods instead of buying from hand to mouth if prices really represented a profitable investment.

The most common explanation offered by manufacturers for maintaining prices is that freight charges and labor costs preclude reductions. The purchasing department of a Western electric railway disputes this view on the ground that freight charges are unimportant in the final price of most products and that labor cost, even where no reduction in wages has been made, is now less, due to greater efficiency of workmen.

Another important factor in prices of railway material today is probably overhead expenses. In this connection the general manager of a large traction company in the north-central section points out that the industry at present is largely over-factoried because of wartime expansion. Some of these factories must be closed down or converted to other industries, he thinks, for to continue full operation means 100 per cent overhead on a limited output.

Victoria, Australia, Asks Tenders on Steel Poles and Copper Cable

Tenders are invited by the State Electricity Commission of Victoria, Australia, for 600 steel poles for carrying three, three-phase, 22,000-volt feeder cables and two metallic return telephone circuits, and for 250 miles of hard-drawn copper cable for the Morwell power scheme. Copies of specification No. 47, covering the steel poles, and specification No. 66, covering the copper cable, have been forwarded by A. W. Ferrin, trade commissioner, and have been placed on sale at the Bureau of Foreign and Domestic Commerce, district offices, 734 Custom House, New York City, and 1424 First National Bank Building, Chicago. Tenders must be received at the office of the Electricity Commission, Melbourne, Australia, by May 31, 1921.

South African Railways Request Bids

In connection with the forthcoming electrification of the Durban to Pietermaritzburg and Cape Town to Simons Town lines of the South African Government Railways, the High Commissioner for the Union of South Africa has invited tenders for rolling stock, electrical equipment, etc.

Copper Market Tending Higher

Steps leading to a further drastic cut in copper production have now been taken, and as a result several large mines have closed down entirely. This factor in the market, together with the firm price stand that has all along been taken by large producers, has brought about a decidedly firmer tone. Prices have advanced about ¼ cent since last week's report, and the minimum quotation for prompt delivery is now 12.50 cents. Large producers are still holding to prices of 12.75 to 13 cents per pound for copper delivered over the next two to three months and are reported to have made sales at these figures.

Consumers have apparently decided that nothing is to be gained by holding off longer from covering their needs, and as a result domestic buying interest is decidedly greater. Whether this is but a temporary condition it is, of course, yet too early to say. The most recent companies to suspend operations temporarily are the Anaconda, Utah, Ray, Chino and Nevada Consolidated copper mining companies.

Rolling Stock

The Androscoggin and Kennebec Railway Company, Lewiston, Me., is building in its own shops one 40-ft. steel underframe, motor, gravel flat car.

Brooklyn (N. Y.) Rapid Transit Company is considering with a number of car builders and the Safety Car Devices Company the adaptation of several hundred double-track cars on its surface lines to the safety car principle.

The Monmouth County Electric Company, Red Bank, N. J., has purchased four fifteen-bench, double-truck, open summer cars and six double-truck closed cars. The above rolling stock, it is announced, is not new but in first-class condition and will replace single-truck cars now in use.

Track and Roadway

British Columbia Electric Railway, Vancouver, B. C.—The British Columbia Electric Railway is planning to make an extension from Cloverdale to Blaine. An extension is also contemplated from Huntington, B. C., to Bellingham, Wash.

Denver (Col.) Tramway.—The Denver Tramway will begin improving its lines as a result of the recent fare advance. New steel rails will be laid

NEW YORK METAL MARKET PRICES

	Mar. 2, 1921	Mar. 30, 1921
Copper ingots, cents per lb	12.50	12.75
Copper wire base, cents per lb	15.25	15.00
Lead, cents per lb	4.00	4.10
Nickel, cents per lb	41.00	41.00
Zinc, cents per lb	5.10	5.15
Tin, cents per lb	29.37	29.37
Aluminum, 98 to 99 per cent, cents per lb	28.00	28.00

OLD METAL PRICES—NEW YORK

	Mar. 2, 1921	Mar 30, 1921
Heavy copper, cents per lb	10.25 to 10.50	9.50 to 10.25
Light copper, cents per lb	8.00 to 8.25	7.00 to 8.50
Heavy brass, cents per lb	6 00 to 6 50	5.50 to 5.75
Zinc, old scrap, cents per lb	3.00 to 3.12	2.87 to 3.00
Yellow brass, cents per lb	4.00 to 4.25	4.00 to 4.25
Lead, heavy, cents per lb	3.25 to 3.50	3.25 to 3.50
Steel car axles, Chicago, per net ton	16.50 to 17.00	14.50 to 15.00
Old car wheels, Chicago, per gross ton	18.00 to 18.50	13.50 to 14.00
Steel rails (short) Chicago, per gross ton	15.50 to 16.00	12.00 to 12.50
Steel rails (rerolling), Chicago, gross ton	15.00 to 15.50	12.00 to 12.50
Machine shop turnings, Chicago, net ton	6.50 to 7.00	5.50 to 3.00

ELECTRIC RAILWAY MATERIAL PRICES

	Mar. 2, 1921	Mar. 30, 1921
Rubber-covered wire base, New York, cents per lb	16.50	16.50
Weatherproof wire base, New York, cents per lb	17.50	17.50
Standard Bessemer Steel Rails, per gross ton	45.00	45.00
Standard open hearth rails, per gross ton	47.00	47.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	.....	.....
Rails, girder (grooved), per gross ton, f.o.b. mill	.....	.....
Wire nails, Pittsburgh, cents per lb	3.10 to 3.25	3.00 to 3.25
Railroad spikes, drive, Pittsburgh base, cents per lb	3.65	3.65
Tie plates (flat type), cents per lb	2.75	2.75
Tie plates (brace type), cents per lb	2.75	2.75
Tie rods, Pittsburgh base, cents per lb	6.00	6.00
Fish plates, cents per lb	2 75	2.75
Angle bars, cents per lb	2.75	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb	5.50	5.00
Steel bars, Pittsburgh, cents per lb	2.00 to 2.35	2.00 to 2.35
Sheet iron, black (24 gage), Pittsburgh, cents per lb	3.85 to 4.20	3.70 to 4.20
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	4.80 to 5.25	4.55 to 5.25
Galvanized barbed wire, Pittsburgh, cents per lb	3.85 to 4.10	3.85 to 4.10

	Mar. 2, 1921	Mar. 30, 1921
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.70 to 3.95	3.70 tc 3.95
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes, A quality), New York, discount	79%	79%
Waste, wool, cents per lb	11 to 17	11 to 17
Waste, cotton (100 lb. bale), cents per lb.		
White	9.00 to 14.00	9.00 tc 13.00
Colored	7.00 to 11.00	7.00 to 11.00
Asphalt, hot (150 tons minimum), per ton delivered	40.00	40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	36.00	36.00
Asphalt, filler, per ton	36.00	36.00
Cement, New York, per bbl	4.10	3.50
Linseed oil (raw, 5 bbl. lots), New York, per gal	.72 to .73	.68 to .70
Linseed oil (boiled, 5 bbl. lots), New York, per gal	.74 to .75	.70 to .72
White lead (100 lb. keg), New York, cents per lb	.13	.13
Turpentine (bbl. lots), New York, per gal.	.57 to .59	.54

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* These prices are f.o.b. works, with boxing charges extra.

on the Stout and Kalamath Street lines to replace several blocks of old track which will be torn up.

St. Petersburg (Fla.) Railway.—The St. Petersburg City Commission has ordered an election to be held on April 19 to vote on a bond issue of $260,000 of which $65,000 of bonds will be issued to build an extension of the street railway, which is municipally owned, out First Street and a loop around by First Avenue. Citizens have pledged to buy the bonds at par if they can't be marketed otherwise.

Evansville, Ind. — Benjamin Bosse, Mayor of Evansville, Ind., assured a delegation of more than 400 people at a hearing a few days ago of his assistance in getting an extension of the car lines through Howell, a suburb of Evansville. The matter has been referred to the railroad committee of the Evansville City Council for action.

Indiana Public Service Corporation, Fort Wayne, Ind.—R. M. Feustel, president of the Indiana Public Service Corporation in securing permission to double track the line on Pontiac Street to the city limits has answered the objection that the street is too narrow. Mr. Feustel has stated that Pontiac Street is the only through street south of the railroad along which the line could be built and though the pavement is narrow there are possibilities of widening it and making it the logical thoroughfare east of Calhoun Street and south of Creighton Avenue.

Power Houses, Shops and Buildings

United Railways, St. Louis, Mo.—The United Railways is planning the building of four electric plants at a cost of $285,000.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.—The Omaha, Lincoln & Beatrice Railway has completed a concrete and steel carhouse and shops.

Alabama Power Company, Montgomery, Ala.—The Public Service Commission has granted a certificate of necessity for the construction of a large power unit near Lock 12 on the Coosa River to the Alabama Power Company. The company has also received permission for the construction of a transmission line from Roanoke to Lafayette and another from Auburn to Tuskegee.

Indiana Service Corporation, Fort Wayne, Ind.—Power for the street cars in Fort Wayne, Ind., will be supplied from a new substation to be erected by the Indiana Service Corporattion at the corner of Melita and Webster Streets. The ground has been purchased and the preliminary work on the construction of the building is under way. The plant will be housed in a one-story brick building measuring 40 ft. by 80 ft. Motor generator sets will be removed from the company's main plant on Spy Run Avenue to the new station.

Laconia Street Railway, Laconia, New Hampshire.—The Laconia Street Railway expects within the next six months to purchase one 200-kw. synchronous motor-generator set.

Professional Notes

Louis T. Klauder has resigned as construction engineer of the Philadelphia Rapid Transit Company and has opened offices in the Pennsylvania Building, Philadelphia, as a consulting engineer specializing in power plant design and construction.

C. G. Young, consulting engineer, has organized the C. G. Young Company, Inc., to act as consulting engineers. The field of the new company will include, among other engineering work, that of the investigation and placing of new and fundamental inventions and processes, as well as to assist manufacturers to take on new lines of manufacture which would be of profit to them. Mr. Young's experience in domestic and foreign fields extends over thirty years, and a considerable part of this time he has been engaged in public utility engineering. The headquarters of the company will be at 501 Fifth Avenue.

Trade Notes

The Waterbury Battery Company, Waterbury, Conn., announces the election of E. E. Hudson as president and Francis T. Reeves, treasurer.

Austin Machinery Corporation, manufacturer of concrete mixing machines, etc., lost several buildings by fire at its Winthrop Harbor, Ill., plant on March 22. The damage will not in any way interfere with production and prompt delivery of its products, however, it is announced, as the company's plants at Muskegon, Mich., and Toledo, Ohio, are well equipped to care for customers.

Electrifying Rumanian Railroads.—The Bukarest government is considering the electrification of a number of its railroads. Large orders have already been placed in Germany, the Orenstein-Koppel Works alone having received orders to the amount of 90,000,000 marks. It is reported that additional orders will be placed in the near future.

Swedish Commission to Study Swiss Electrification.—Advices from Switzerland state that during the next few weeks a commission of foreign engineers will visit Switzerland for the purpose of studying the electrification of the Swiss railroads. The commission will be composed of three American and three Swedish engineers. Mr. Oefverholmen, the Director General of the Swedish State Railways, heads the commission. The foreign engineers will inspect the Gotthard and Lotshberg lines and the large new power stations on both of these lines.

The Refractories Manufacturers Association, at its annual meeting March 16 to 18, in New York, re-elected the following officers: J. D. Ramsey, Elk Fire Brick Company, St. Marys, Pa., president; J. L. Green, Laclede-Christy Clay Products Company, St. Louis, Mo., vice-president; C. C. Edmunds, McLain Fire Brick Company, Pittsburgh, treasurer; F. W. Donahoe, 840 Oliver Building, Pittsburgh, the association's executive offices, secretary; E. M. Durant of the Pacific Clay Products Company, Los Angeles, Frank J. Helwig of the Standard Fire Brick Company, Pueblo, Col., and C. E. Kapitzky of the Federal Refractories Company, Cleveland, were elected to the executive committee.

The United States Rubber Export Company, 1790 Broadway, New York, as distribution unit of the United States Rubber Company in foreign fields, has new branches in process of being opened in Batavia, Java, as the Dutch East Indies branch, in Brussels, Belgium, and in Copenhagen, Denmark. A full line of electrical conductors, insulating friction tape and rubber splicing tape is to be carried in each branch, as is now carried in existing branches in Havana, Rio de Janeiro, Montevideo, Buenos Aires, Santiago de Chile, Manila, London, Madrid and Johnannesburg. Exclusive distributing arrangements are maintained in Mexico, Venezuela, Porto Rico, Barbados, Peru, Colombia, Bolivia and India, where stocks are also carried.

New Advertising Literature

Compressor. — The Griscom-Russell Company, 90 West St., New York City, has issued bulletin No. 350, describing the "G-R Regenerative Compressor."

Portable Instruments.—The Westinghouse Electric and Manufacturing Company is distributing leaflet No. A3501, describing its type PX portable instruments for general testing purposes.

Insulating Fabric. — A non-woven fabric sheet and tape for insulating purposes, "Voltape," has been developed by the Res-Pro Industries, Inc., 209 Washington Street, Boston.

Indicators and Gages. — The Bacharach Industrial Instrument Company, Homewood Station, Pittsburgh, is distributing pamphlet M, covering its engine indicators (Maihak type). Bulletin G describes its "Easy Read" manometers and gages.

Pump Governor. — Having acquired sole rights to manufacture and sell Ideal Pump Governors the Atlas Valve Company, 282 South Street, Newark, N. J. is now distributing its first bulletin, No. 1-A, edition No. 1, describing this governor.

Combustion Recorder.—Mono Corporation of America, New York City, has issued a bulletin describing its "Duplex Mono," which simultaneously records on one diagram both the surplus of air in process of combustion and the degree of incomplete combustion.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, April 9, 1921 *Number* 15

All Franchise Clauses Should Be Clearly Expressed

THE controversy now going on in Toronto over the interpretation of a clause in the franchise of the street railway company again calls attention to the necessity for careful drafting of such grants so that all their terms may be clear not only at the time of origin but at any date in the future. The Toronto franchise expires on Sept. 1 of this year, at which time the city hopes to exercise its privilege of taking over the property. Thirty years ago when the grant was accepted both parties to the deal probably understood all the provisions. As the time for agreeing on a purchase price draws near there is a division of opinion over the intent of several clauses bearing on valuation.

One of the clauses says that in determining a value the arbitrators are to consider only the value of the actual and tangible property necessary to the operation of the railways; also, that the arbitrators are to award only the value at the time of the arbitration, "having regard to the requirements of a railway of the best kind and system then in operation and applicable to the said city."

It is interesting to note that while this franchise was drafted some thirty years ago, both parties to the agreement then recognized the principle that payment should be made only for "property used and useful in the public service." Since that time many of the public utility laws in the United States have embodied the same principle, and thus in determining a valuation of a public service property some of the old contentions have been eliminated. The Toronto grant would appear clearly to exclude any claim for capitalization of franchise, good will or earning power.

Woolworthing the Car Ride in Beaver Valley

BY "WOOLWORTHING" the car ride, nothing more nor less is meant than the application of the practices made so successful by the late Frank W. Woolworth to electric railway merchandising by the sale to customers of articles in such sizes or quantities that they can be sold for a small and single coin. Such an example of Woolworthing is given by the experience of the Beaver Valley Traction Company, described in this issue under the heading "Adjusting the Fare to Length of Ride." To discuss the pros and cons is unnecessary, inasmuch as the article speaks for itself, but an outline of the situation that had to be faced may be helpful.

The Beaver Valley Traction Company, as its name implies, is a river valley railway. It is one of those long, shoestring roads serving a mixture of small towns and sparsely peopled country that is much more common in the United States than in countries which have been less liberal with electric railway promotion and building. In pre-war days it was a multiple-fare railway made up of 5-cent sections, but with a 4½-cent fare for the buyer of ticket books. First, the fares were brought closer to 5 cents flat. Later, the company "followed the crowd" by seeking increased revenue through a higher unit fare per section, this fare being successively 6 cents and 7 cents. These successive changes brought the company up squarely against the facts that its traffic was falling off and that it was not getting all the revenue hoped for and needed. From the railway checks of the traffic that it had (the passenger on the car) and of the traffic that it wanted (the rider in the automobile and pedestrian on the sidewalk), it turned out that more than half the actual and possible business was short haul. As a consequence, the management came to the conclusion that a shortening of the zones, the restoration of the 5-cent unit rate, the elimination of transfers on one route and the modification of transfers on another offered better prospects. Upon this change it superimposed a second one welcome to the short rider, namely, a shortening of headway from twenty to ten minutes on at least one line to date. The results have been all that could be expected, for the increase in traffic in the urban parts of the system has been great enough to produce more dollars than the longer ride at the higher fare.

The Problem of the Abandoned Line

THE report of the Massachusetts Department of Public Utilities on the subject of the support of electric railway lines in that State, reviewed elsewhere in this issue, is of interest outside as well as within Massachusetts as the report naturally includes a consideration of the question of abandoned lines. According to the report of the Massachusetts commission, in that state alone 371 miles of track have been abandoned up to the present time.

This condition existing in a state which has, from the earliest days of the industry, consistently applied strict regulation of all financing and operation shows clearly that there is something more than overcapitalization or mismanagement involved in the instance of these abandoned and poorly paying lines, in spite of the apparently unceasing clamor of political demagogues and would-be economists, whose chief stock in trade seems to be destructive rather than constructive criticism.

Although the Massachusetts report does not attempt any blanket recommendation for the resumption of service on all abandoned lines, it is at least constructive and reasonably optimistic. It clearly recognizes the economic fact that if a community is to have street car service somebody must meet the entire actual cost of that service, and it recommends that the individual community directly concerned devise the best means of meeting that cost, rather than resorting to state ownership or subsidy. At least it believes this plan should have a fair trial before any more extensive experiment be made in the direction of the State's assumption of the obligation. The probability of reduced wage scales and lower prices generally was apparently in the minds of the commissioners when they referred to possible future far-reaching economic changes which are likely to bring relief. The recommendation that the street railways be freed from all charges for construction and repair of streets and bridges and from the taxes intended to be in commutation of such charges would seem to be in line with sound public policy, and capable of relieving at least a part of the present strain.

The Massachusetts Department of Public Utilities has done wisely in refraining from attempting to specify particular lines which should be re-established and others which should not be. Presumably the people in the communities which have lost the service are best able to decide just how much they need the street railway after having done without it for a while or having tried some substitute methods of transportation. And if the legislation proposed by the department is acted upon by the Massachusetts Legislature, the people of that State will have at hand a means of preventing the discontinuance of any line, or the restoration of service on any line, by the simple but essential expedient of providing the necessary funds to keep it going.

Governor Miller Carries Through His Traction Reform

GOVERNOR MILLER of New York has had his way. One of his early official acts after taking office on Jan. 1 was to indicate to the legislators the need for constructive action looking particularly toward relief from the intolerable conditions into which war-time costs and the unbending attitude of the Hylan administration had thrown the railways in the greater city. Gradually as the purposes behind the Governor's special message became plain the opposition among the legislators dwindled until the only voices that remained to protest were those of the Democratic minority and the Socialists. Political strategy apparently dictated the course pursued by the Democrats. The Socialists of course, as ever, were the irreconcilables.

The bill that has become law is broad and sweeping in its powers, but no less so than would seem to be necessary if the regulatory bodies which it creates are to be permitted to function properly. On account of the investment of the city of New York in the present subways the cry has been raised by the opposition that the new measure is unconstitutional because it makes incumbent upon the city the acceptance of such proposals as may be evolved by the Transit Commission for New York City in laying down a plan for settlement there.

The bill does not provide a settlement; it merely creates a means whereby a settlement can be brought about. Until the commission has functioned and brought forth its plan it would seem that the opposition to the measure is merely tilting at windmills. The commission under its wide powers will have certain strong cards to play in the interest of the city, and it is not beyond the bounds of probability that the new body may evolve a plan of settlement under which the city will benefit no less materially than the companies.

Those who have assumed that the commission has been created by, for and in the interest of the corporations which it will regulate cast doubt on the motives of the Governor, indirectly charge with subservience all the legislators who voted for the measure and ignore all the evidence in the case. In arrogating to itself the sole right of defender of the city in the traction matter the Hylan administration assumes a rôle not altogether in keeping with its past performances. Many champions there are with no axes to grind who can be counted upon to come to the aid of the city if necessary, but they are content to remain impassive until the need shall become unmistakably evident that they should intervene.

The personnel of the commission is extremely important, probably more so than some of the law's provisions. Its announcement by the Governor is awaited with interest.

Should There Be an Exhibit This Year?

IT IS the time now when the association must decide whether it will hold an exhibit this year, and a questionnaire has been sent to manufacturer members asking their views on the subject. The circular is being sent at the request of a committee of manufacturers to whom President Gadsden has referred the matter. The position of the railways in this question is understood to be that if the manufacturers desire to make an exhibit they will be pleased to have one, but they consider the matter should be determined primarily by the manufacturing companies themselves. The latter have wisely decided to obtain a consensus of opinion, and the questions asked are whether the manufacturer members are in favor of holding an exhibit at Atlantic City this year, if the company will exhibit if such an exhibition is held, and if so how much space it will require. The letter mentions as reasons why the association might dispense with an exhibit this year the depression in business conditions and the fact that the proposition presented by the representatives of the pier at Atlantic City is considered unsatisfactory.

Considerable can be said both in favor of and against the plan of holding an exhibit. In favor of the plan, the principal arguments are probably as follows. An exhibit undoubtedly would attract a larger number of delegates to the convention than if there was no exhibit. This is especially true with reference to equipment men and others who do not travel around over the country so much as the higher officers and executives. To some manufacturers, particularly those making bulky exhibits, the annual exhibition is the most economical way by which this new equipment can be shown to a large number of railway men. With the exhibits and meetings on the pier, an unequaled opportunity is afforded to the attendants at the convention to make and renew acquaintances and discuss matters relating to the industry.

Among the positive arguments against the exhibit the most important undoubtedly is the large cost of transporting the exhibits to Atlantic City and renting the space there, and while the electric railway business may be in better condition than for some years past, the present business depression affects all manufacturers engaged in general business, and this includes of course most manufacturers of electric railway apparatus. There are, of course, precedents for the omission of the exhibit, as in 1915 on account of the exhibition at the San Francisco Fair, and in 1917 and 1918 on account of the war. In this connection it is argued by some that annual exhibits were justified in the early days of the industry when the exhibits were smaller and equipment was changing rapidly, but that an exhibit now every other year would probably answer all practical purposes. Again, with the exhibit omitted, some more central location than Atlantic City could be selected for the convention—some place, for instance, where the delegates can find much to interest them on the local railway. This would to some extent take the place of an exhibition and would actually allow the inspection of electric railway apparatus under working conditions. In such a case, manufacturer members could well assist in making the gathering a success by offering their services as guides over the property. With such a plan it is argued that the railway men would get more real information for every dollar of expense than they would if the meeting was held at Atlantic City. This plan of visiting a different city was the one followed by the association before the exhibits became so extensive that they could be housed only in a place with such facilities as are at Atlantic City. A return to the earlier policy, it is urged, even for one year, would be welcome, as it would give delegates an opportunity to study railway practice in some city of whose railway system and methods they have often heard but never had an opportunity to study at first hand.

Some of the arguments in favor of each plan have been recited so that the members can weigh them carefully before sending in their vote, if they have not already done so. In this connection the poll of the members of the Railway Business Association in regard to exhibits at the June convention in Atlantic City and the March convention in Chicago of the steam railroads is of interest. The decision of the Railway Supply Manufacturers Association to omit in 1921 its exhibit at Atlantic City was reached while the replies in this inquiry were being compiled. Of 146 Railway Business Association members expressing their sentiment by referendum, 43.2 per cent prefer holding the Million Dollar Pier and Chicago Coliseum exhibitions annually and 56.8 per cent favor holding them less often than once a year. Favoring biennial displays were 27.4 per cent; favoring triennial, 19.2 per cent. Other suggestions made up the difference. It is of interest to note also that the National Electric Light Association will not hold the usual exhibit in connection with its annual convention this year.

There is of course no question of giving up the technical meetings of the convention. The convention ought by all means to be held this year in some city, either Atlantic City or elsewhere, and there ought to be a large attendance for the discussion of the reports and papers. Even if there is no exhibition this year attendance should include as full a representation as in the past from the manufacturer companies, not only so they can tell the railway men all of their own developments during the past year but so that they can get ideas from the latter on ways to improve their equipment. Further, they can sense the thought and needs of the industry and be in a better position to assist in future developments. Finally, the reasons for the abandonment of the June steam railroad exhibit do not hold because, broadly speaking, the electric railways are undoubtedly in better financial condition than the steam railroads, as they have passed the depth of their depression.

The Trend in Wages Is Downward

TRAINMEN'S wages bulk large in the total of operating costs. An increase of a cent or two an hour in them often may mean the difference between black and red in the income figures just as a decrease in them of a cent or two may mean the difference between red and black. It is these facts that are now driving electric railways all over the country to insist that wages shall come down as part of the necessary readjustment in evidence everywhere to bring industrial conditions back more nearly to normal.

In Albany a strike followed the pruning of wages. Other strikes for the same cause would appear to be pending. In the light of the facts, however, the resort to the strike must prove, as it has in Albany, disastrous to the men who engage that means of trying to stem the inevitable tide of downward prices everywhere. The company at Albany has had very little trouble in recruiting an entirely new force at the reduced wages offered to its old men, while companies elsewhere are reported to have closed their waiting lists, so great has become the number of applicants seeking jobs.

Most significant of all, however, is the case of the Eastern Massachusetts Street Railway. While the men on the lines of that road still in operation are talking in stentorian tones through their accredited spokesman about resisting to the very limit a proposed reduction in wages, the men on the Gloucester lines of the company, many of whom have been out of work ever since the road there shut down on June 1, 1920, are seeking their old jobs at the new scale proposed to be made to apply to the whole system. Men who are still employed may be inclined to dispute the index figures which indicate the trend of the cost of living, but men such as those at Gloucester, who are out of a job, are the real judges of what their labor will command in the open market.

Labor, skilled and unskilled, may not be a commodity, but it is worth only what it will command in the open market. Even with increasing intelligence everywhere it is still difficult to obtain acceptance of the fact that wages are to a very large extent self-adjusting. That this is so is indicated by the instances at Albany and in Eastern Massachusetts which have just been cited. If the employer had as much to do with fixing labor prices as labor is inclined to think, then the unscrupulous employer would indeed be in a position to wield an influence most detrimental to society.

Quotation from the Federal Electric Railways Commission Report

No. 15

WE WOULD particularly urge public officials and officers of the electric railways to cooperate seriously in the protection and preservation of all corporate, financial and cost records.

Service-at-cost plans have been recently rejected by popular vote, largely on the issue of valuation, in Chicago, Denver and Minneapolis. The public, justly or unjustly, has become so suspicious of the electric railway companies that it may be expected to reject any service-at-cost or public ownership question submitted to popular vote, no matter how fairly the plan may be formulated, if it is not thoroughly convinced that the capital item has been fairly and honestly arrived at. The failure of a company to preserve its record may in the end hurt its stockholders more than it may the public.

PANORAMIC VIEW OF NEW BRIGHTON, THE HEADQUARTERS OF THE BEAVER VALLEY TRACTION COMPANY

Adjusting Fare to Length of Ride

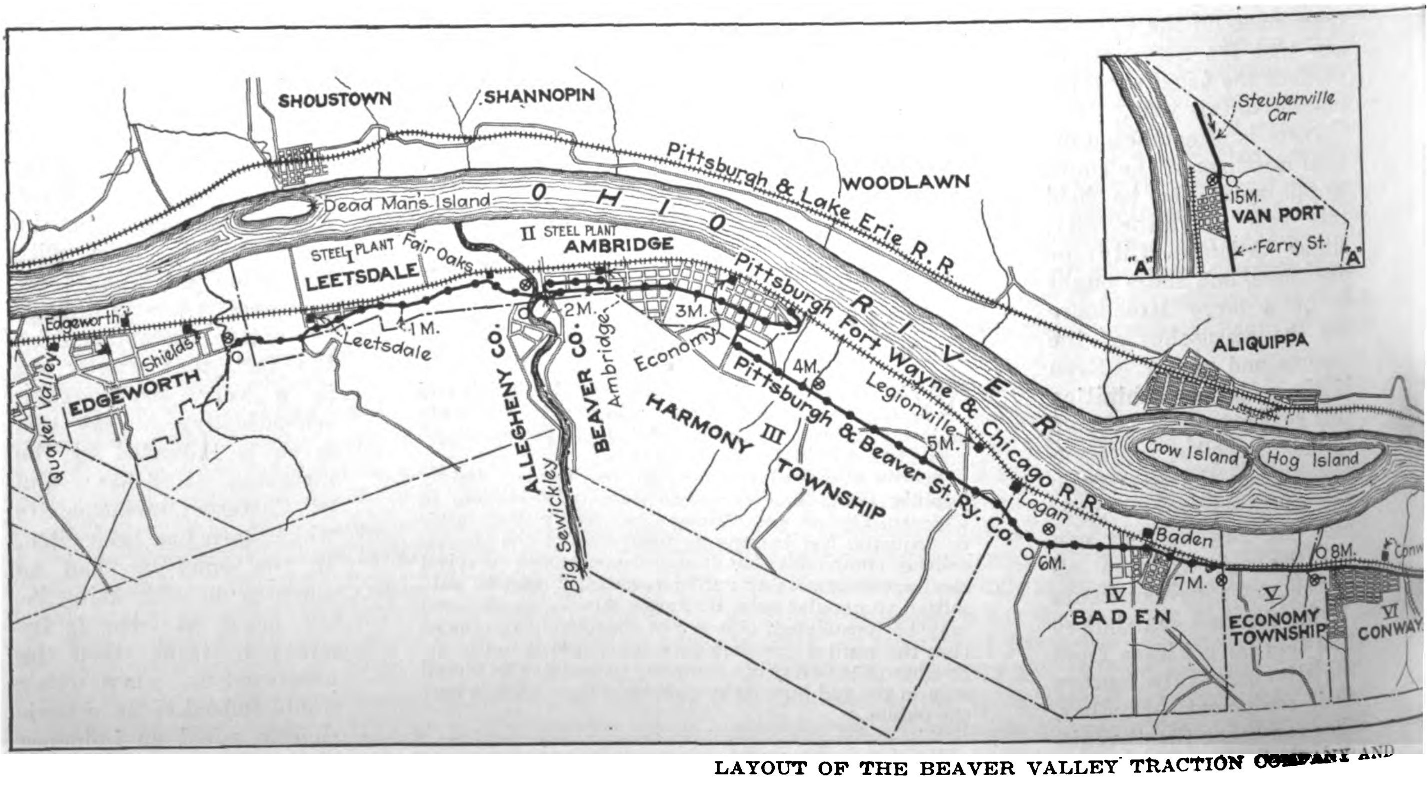
Five-Cent Fares for Short Rides Retained by Beaver Valley Traction Company, High Zone Fares Having Been Found to Decrease the Utility of the Electric Railway—Short Zones Are Established After Traffic Surveys — Incidentally Revenues Have Increased as Railway Keeps Functioning

THE contradictory deductions made from data on fare increases in relation to changes in traffic have proved the necessity for studying each property and even the individual lines of each property separately in order to equate the value of the different factors that make up the total result. A study of this kind has been made available by W. H. Boyce, general manager of the Beaver Valley Traction Company, who is a decided believer in studying and meeting the needs of transportation patrons from the merchandising standpoint.

A COUNTRY SHOESTRING SYSTEM

The Beaver Valley Traction Company and its associated Pittsburgh & Beaver Street Railway are not favored by a heavy tributary population. There are 26 miles of route and 51 miles of track for a population of about 66,000. The trunk line, as shown on the accompanying map, strings along for 19 miles through the Beaver and Ohio valleys between the boroughs of Leetsdale and College Hill, with branch-offs to Beaver and Monaca (2.69 miles and 1.5 miles respectively) and a 2.59-mile crosstown line known as the Riverview Line between New Brighton and Beaver Falls. Expansion of the towns is almost everywhere limited by rivers and hills. Even the largest towns are but twelve squares or blocks in width while the smaller communities are only four to seven squares wide. The back country is merely very poor farming land with little tributary population. The travel characteristics on such a system are naturally dependent to a large degree upon the location of the manufactories and picture houses in the district.

Except for Beaver and Baden, the district along the railway is industrial, with steel and iron production predominating and glass, brick and other clay industries also a factor. Quite a large number of the


SHOUSTOWN
SHANNOPIN
Pittsburgh & Lake Erie R.R.
WOODLAWN
Dead Man's Island
O H I O R I V E R
STEEL I PLANT
Fair Oaks
LEETSDALE
II STEEL PLANT
AMBRIDGE
Pittsburgh Fort Wayne & Chicago R.R.
Edgeworth
Shields
EDGEWORTH
Quaker Valley
1M.
Leetsdale
2M.
3M.
ALLEGHENY CO.
BEAVER CO.
Ambridge
Economy
Big Sewickley
HARMONY III TOWNSHIP
4M.
Pittsburgh & Beaver St. Ry. Co.
Legionville
5M.
Logan
6M.
Baden
7M.
8M.
Conw
IV BADEN
V ECONOMY TOWNSHIP
VI CONWAY
ALIQUIPPA
Crow Island
Hog Island
Steubenville Car
15M.
VAN PORT
Ferry St.
"A"
"A"

LAYOUT OF THE BEAVER VALLEY TRACTION COMPANY AND middle-class citizenry work in Pittsburgh and commute via the Pennsylvania and Pittsburgh & Lake Erie Railroads, whose routes are also shown on the map. As the Pennsylvania runs fifty-seven trains and the Pittsburgh & Lake Erie fifty-six trains daily, it may be guessed that the electric lines do not get much through business. Then, too, the steam rates to commuters are only $11.90 per month for a sixty-trip ticket covering a one-way 28-mile ride. With an average of but fifty-two trips a month, this is 1,456 miles for $11.90 or 0.82 cents per mile, a rate out of the question for single-car electric operation in this kind of territory.

Besides this practical monopoly of long-haul business by the steam railways, the electric railways have to contend with the insidious and ubiquitous private automobile which cuts into both short-haul and long-haul opportunities indifferently. Indeed, as most of the system is along the Lincoln Highway, the electric railways have the doubtful pleasure of paying for the upkeep of paving used both by the stranger and by the local man who is letting the car rider pay for his pleasure! As a rule the thoroughfares in this territory are wide and most of them are paved. The electric railways must not only maintain the usual strip of paving but in some cases are expected to pave the whole street as well.

The topographical conditions mentioned naturally tend to make most of the communities, small though they are, self-contained. Each town has its own grocers, meat shops, clothiers, churches, etc. The proximity of Pittsburgh and the diffusion of the valley population are factors which tend to keep theatrical road shows out of the Beaver Valley. Strong rivalry between the excellent picture houses in Beaver Falls and Rochester is one of the few causes of intertown travel.

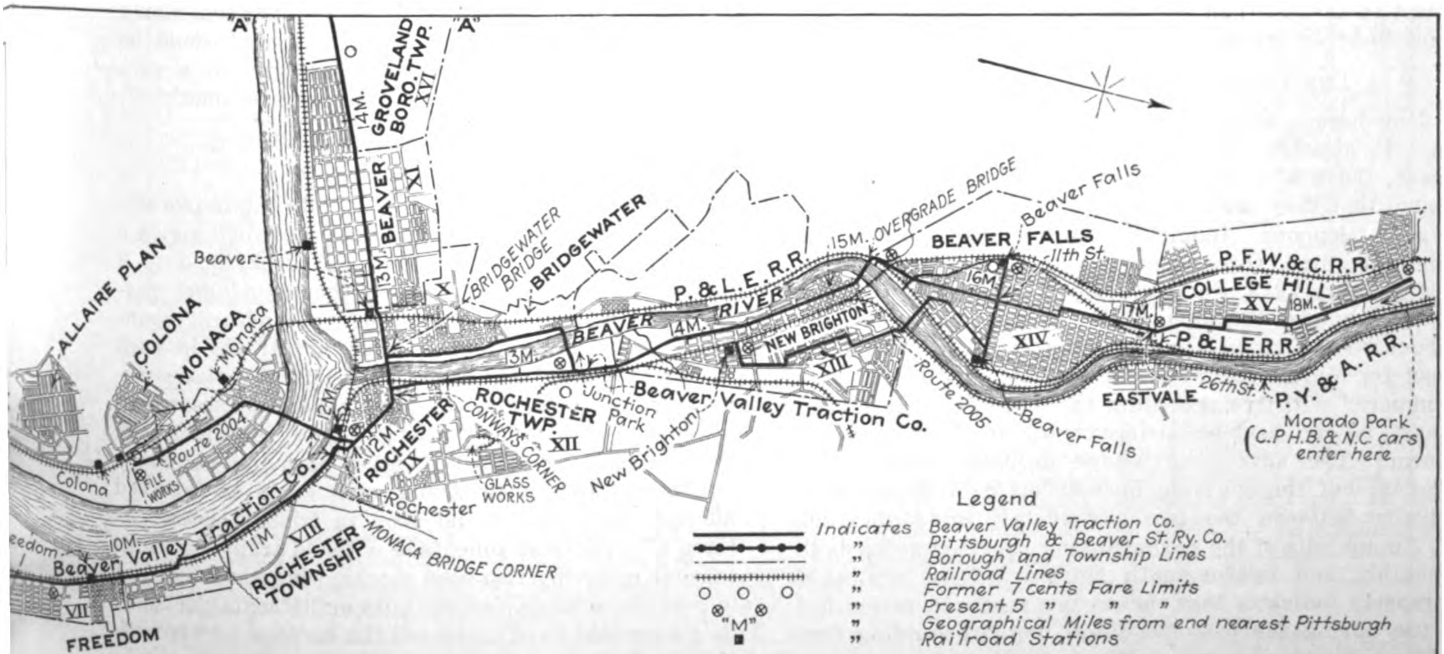
Between College Hill and Vanport—9.5 miles; between Ambridge and Leetsdale; and throughout Rochester and Monaca the company is giving a ten-minute car service; on the Riverview division between Beaver Falls and New Brighton fifteen-minute service and on the remainder of the system a twenty-minute service. With the arrival of more safety cars this headway will be shortened so as to give from 50 to 100 per cent more service.

A real millstone around the neck of the management is the Pittsburgh & Beaver Street Railway, from Leetsdale to Baden, an 8.5-mile double-track route, built fourteen years ago as a link between the Beaver Valley Traction Company and Pittsburgh. Even today the total population served is within 15,000—yet at the time of construction there were only 4,000 people to cater to! A remaining gap of 1.75 miles still prevents the long-planned connection with Pittsburgh.

PASSENGER-QUIZ SURVEY PRECEDED FARE CHANGE

As the 7-cent base fare for zones up to 6 miles was not producing the revenue, Mr. Boyce determined to make a survey with the thought in mind of securing more revenue through the introduction of a lower fare for a reduced distance. During October, 1919, following notices in the local papers, traffic checkers boarded the cars to hand "on and off" slips to the passengers. The public was fully informed as to the object of this survey and co-operated in the most satisfying way. (See ELECTRIC RAILWAY JOURNAL, Nov. 8, 1919.) Checks were also made of pedestrian traffic to secure a basis for figuring on the transformation of walkers into riders.

The net result was the working out of a plan whereby the 5-cent fare was restored, but the zones were cut down to an average of 2 miles. Reference to the map will show that the fare points are not laid out to coincide with geographical miles but in accordance with the natural traffic gathering points. This change, of course, was sufficient to restore the 5-cent fare for most of the intra-community riding, and in some cases even the long rider through the thinnest territory had little more to pay. On the other hand, certain transfer privileges were withdrawn, some 7-cent zones became two or three 5-cent zones, etc. Of course, the people who had to pay more were somewhat vocal about it, but after all it was evident that the majority had no complaints


"A"
"A"
GROVELAND BORO. TWP.
XVI
14M.
BEAVER
XI
13M.
X
Beaver
ALLAIRE PLAN
COLONA
MONACA
Monaca
BRIDGEWATER BRIDGE
BRIDGEWATER
P. & L. E. R.R.
BEAVER
RIVER
13M.
14M.
15M.
OVERGRADE BRIDGE
Beaver Falls
BEAVER FALLS
11th St.
16M.
P. F. W. & C. R.R.
COLLEGE HILL
XV
17M.
18M.
P. & L. E. R.R.
XIV
NEW BRIGHTON
XIII
Route 2005
Beaver Falls
EASTVALE
26th St.
P. Y. & A. R.R.
Morado Park (C.P.H.B. & N.C. cars enter here)
Junction Park
Beaver Valley Traction Co.
ROCHESTER TWP.
XII
CONWAYS CORNER
New Brighton
GLASS WORKS
Rochester
ROCHESTER
IX
12M.
12M.
Route 2004
FILE WORKS
Colona
Beaver Valley Traction Co.
Freedom
10M.
11M
VIII
ROCHESTER TOWNSHIP
MONACA BRIDGE CORNER
VII
FREEDOM
Legend
Indicates Beaver Valley Traction Co.
" Pittsburgh & Beaver St. Ry. Co.
" Borough and Township Lines
" Railroad Lines
" Former 7 cents Fare Limits
" Present 5 " " "
" Geographical Miles from end nearest Pittsburgh
" Railroad Stations
"M"
0
1
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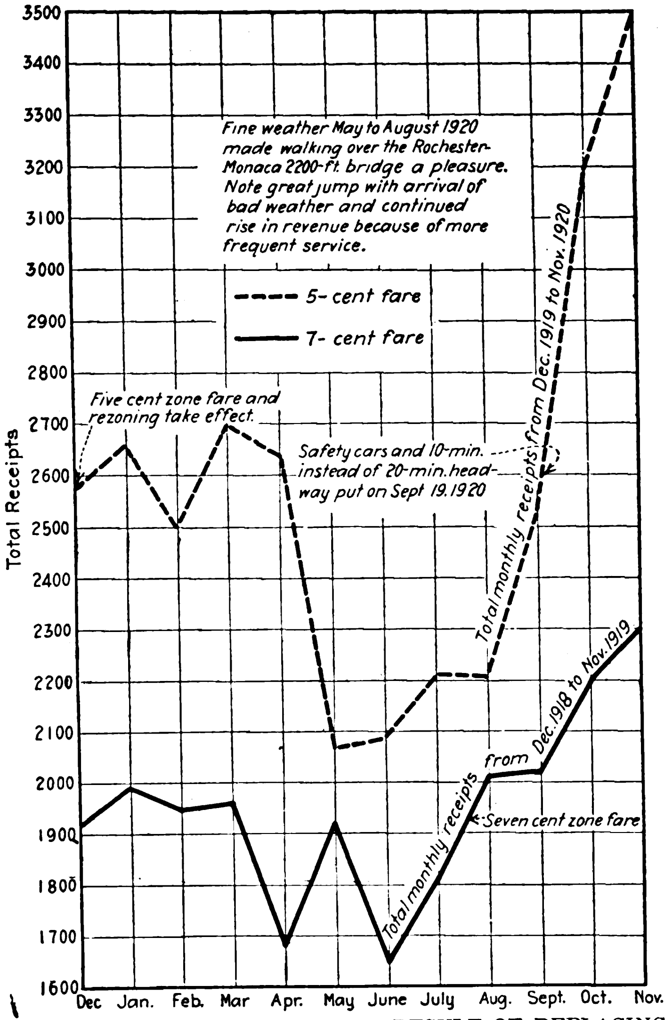
THE PITTSBURGH & BEAVER STREET RAILWAY SYSTEMS



ROUTE 2004, SERVING MONACA. RESULT OF REPLACING 7-CENT FARE WITH TRANSFER BY 5-CENT FARE WITHOUT TRANSFER. LENGTH OF ROUTE 1.5 MILES

to make and that there was every reason why the short rider should be pleased. This schedule became effective Dec. 1, 1919. The increase in revenue was figured to be 19 per cent with no cut in patronage.

The Telephone Proves a Competitor

Now here is where the rivalry of the telephone comes in. It appears that when the increase in fare was made, those who were most unfavorably affected by it found that they could do a lot more shopping and visiting by telephone. Inquiry by the company showed that for the first three months of the fare increase (December, 1919, January and February, 1920) the telephone load throughout the district had increased about 35 per cent. On the other hand, the telephone load for March, 1920, showed a decrease of 10 per cent compared with the preceding three months' period. In short, as one class of business went up the other went down. The advent of winter probably was also a factor; but the opposing fluctuations do indicate some rivalry between the two methods of communication.

An analysis of the accompanying charts showing both monthly and twelve-month figures for the combined property indicates that the service rendered varied but little during the past five years, notwithstanding that the various fare increases did for a time create a considerable traffic loss until merchandising methods were established to sell the wares of the company in quantities that were acceptable to the public.

When this became a fact on Dec. 1, 1919, and fares were based on 5 cents per 2-mile zone business took a boom and more passengers rode than ever before. This is especially shown by the route diagrams hereafter mentioned. Then, with the careful study of developing the riding habit on certain routes and giving better service on a more frequent headway with new and up-to-date cars, the results longed for in the past with high zone fares actually became a realization.

The result of the various fare changes for the past five years is given in Table I. From this table it will be noted that in 1920 there were fifteen zones as against seven when the previous 5-cent-zone fares were in effect. An increase of 59.8 per cent in revenue zone passengers at the expense of a 32.1 per cent decrease in free and transfer passengers indicates that the lower base fare picked up many a short-haul passenger. This perhaps is better shown by the fact that in 1916 the average fare per zone passenger carried was but 4.06 cents, while in 1920 it was 4.60 cents, a gain of 13.3 per cent. The elimination of reduced-rate tickets also had something to do with bringing about this increase. Taking the gain of 2.68 per cent in the average fare per revenue zone passenger from the 13.3 per cent would leave a gain of more than 10 per cent that could be attributed to additional business that brought a gain of 64.6 per cent in the car-mile passenger revenue.

TABLE I—STATISTICS AS TO VARIOUS FARE SCHEDULES

Rates of Fare per Zone	8 Mos. Ended Aug. 31, 1916 5c. Cash 100/4.50 Full Fare Ticket ½ Fare Labor Ticket, ½ Fare School Ticket	Sept. 1, 1916, to Jan. 26, 1918. 5c. Cash, 21/100 Full Fare Ticket	Jan. 26, 1918, to Sept. 5, 1918, 6c. Cash	Sept. 5, 1918, to Dec. 1, 1919 7c. Cash	Dec. 1, 1919, to Dec. 31, 1920, 5c. Cash	Per Cent Increase 1920 over 1916 Plan
Number of fare zones	7	7	7	7	15	....
Avg. length of zones, miles	3–6	3–6	3–6	3–6	2.0	....
Car-mile statistics:						
Passenger revenue, cents	27.1	30.1	31.4	37.3	44.6	+64.6
Revenue zone passengers	5.6	6.11	5.49	5.40	8.95	+59.8
Free and transfer zone passengers	1.09	1.11	1.03	1.025	0.74	—32.1
Total zone passengers	6.69	7.22	6.52	6.425	9.69	+44.8
Average fare per rev. zone passenger, cents	4.85	4.925	5.75	6.94	4.98	+ 2.68
Average fare per total zone passenger carried, cents	4.06	4.16	4.85	5.83	4.60	+13.30

Notes on Traffic Survey that Led to Five-Cent Zones

As a start, the system was divided into thirty-two sections. These divisions were not made arbitrarily upon a mileage basis as their length varied from 0.25 to 2 miles, but with consideration to the actual and possible traffic movement within the most natural boundaries. Then the actual "on and off" traffic in each section was plotted as of Oct. 2, 1919. To these sections there were next applied ten different fare schedules, ranging from 3-cent zones averaging 1.5 miles each to 10-cent zones averaging 3 miles each. A summary of eight of these schemes and what could be expected from each if there was no drop in traffic follows:

Plan 1. Ten-cent zone fare with no transfers, with passenger receiving two zone checks, whereby the actual rate was three zones for 10 cents or 3⅓ cents per zone. This plan would have decreased the revenue by approximately 4 per cent.

Plan 2. Same fare zones as Plan 1 but with 6 cents for first zone and 2 cents for each additional zone. Expected increase in revenue, 2.86 per cent.

Plan 3. Then existing fare zones, averaging 3 to 6 miles. Straight 10-cent zone fare, except that 15 cents would be charged for through passengers passing Junction Park. Fare in Riverview, Monaca and Sharon to be 5 cents without transfer.

Plan 4. Then existing fare zones, averaging 3 to 6 miles. Straight 8-cent zone fare, but with 5-cent non-transfer fare in Riverview, Monaca and Sharon; rest of routes, 8 cents per zone. Expected increase, 11.1 per cent.

Plan 5. Straight zone fare of 7.5 cents with new fare zones, averaging 2 to 3 miles. No transfers in Riverview and Monaca. Expected increase, 42.3 per cent.

Plan 6. Same as Plan 5 except for two shiftings in fare points at Beaver and Rochester. Expected increase, 44.9 per cent.

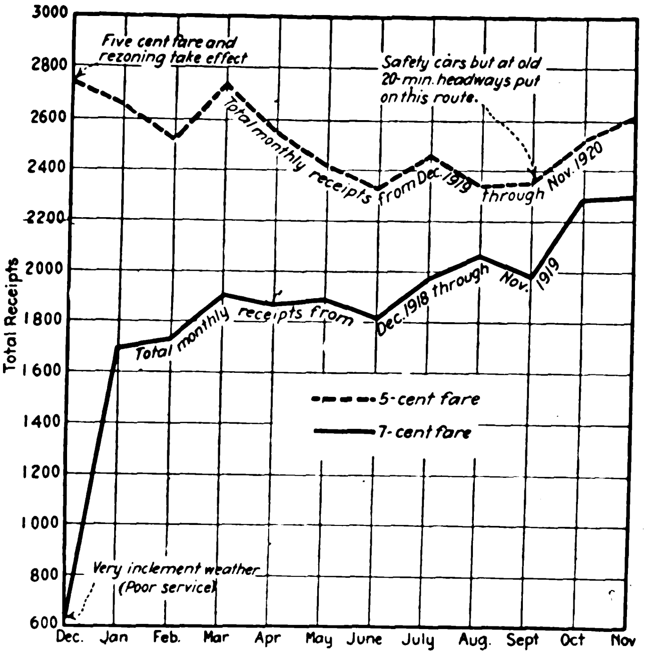
Plan 7. Five-cent zone fare with zones shortened to an average of 2 miles with transfer privileges continued. Expected increase, 12.52 per cent.

Plan 8, as proposed and adopted. Five-cent zone fare with zones averaging 2 miles as in Plan 8, but with transfers eliminated on the Monaca division and modified on the Riverview division. Expected increase, 19 per cent.

Plan 9 was a straight 10-cent fare with zones averaging 3 miles. The theoretical increase in revenue was figured to be 50 per cent.

EARLIER INCREASES SHOWED WISDOM OF KEEPING FIVE-CENT FARE ON SHORT LINES AT LEAST

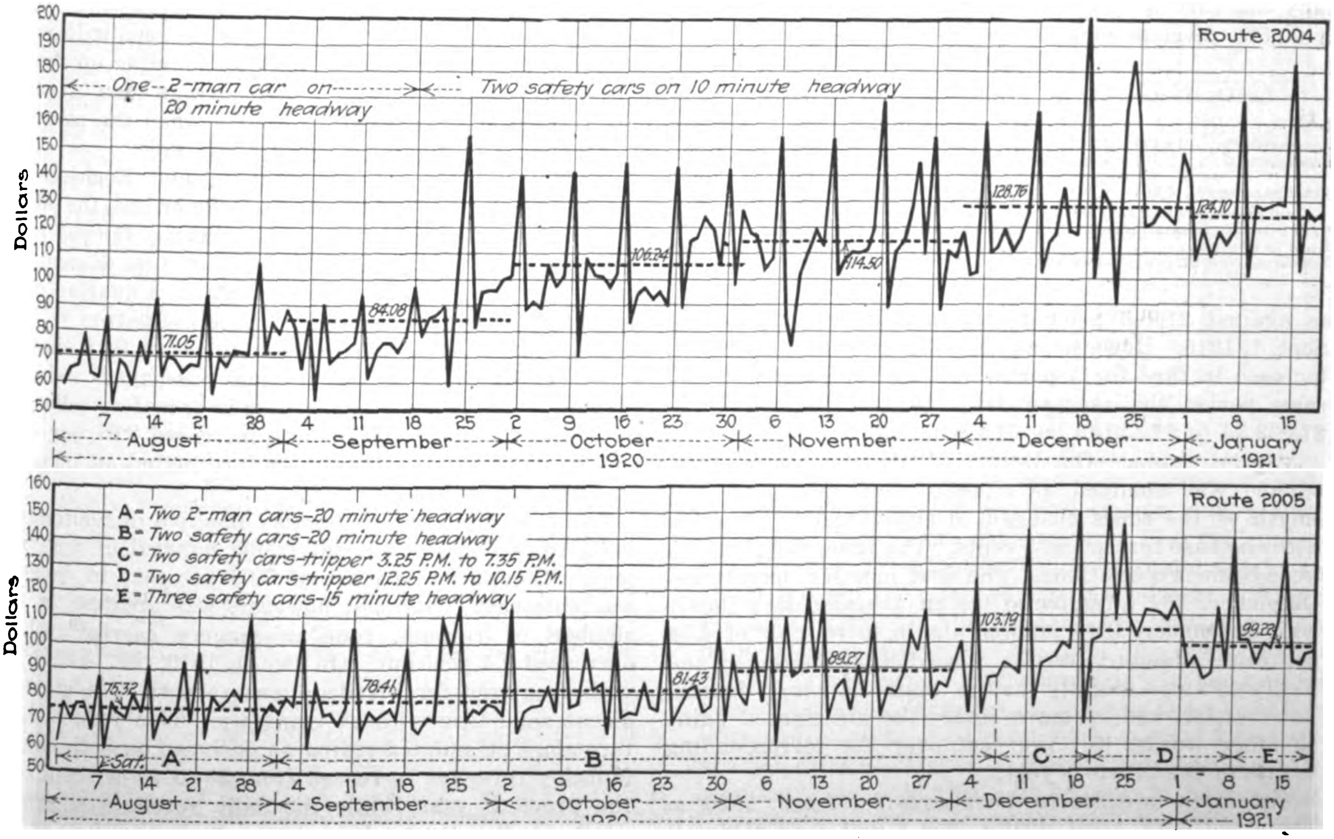
In coming to his deductions favoring short 5-cent zones, Mr. Boyce had two statistical bases to go by in addition to his intimate knowledge of the territory. The first of these bases was the traffic survey of Oct. 2, 1919, and the other the results which had followed the earlier fare increases.



RESULT OF SERVICE BETTERMENT ON ROUTE 2005, RIVERVIEW CROSSTOWN LINE, 2.7 MILES IN LENGTH, CONNECTING NEW BRIGHTON AND BEAVER FALLS FOR A 5-CENT FARE, WHEREAS THE MAIN LINE FARE IS 10 CENTS

The results of the traffic survey, segregated by the nine 7-cent zones, marked on the map showed clearly how dependent the company was on the short-haul riders. Analysis showed that more than 50 per cent of the passengers rode less than what are now two 5-cent zones.

A further increase in the base rate of fare which was then 7 cents might have been disastrous, due to traffic losses, whereas a shortening of the fare zone with



DAILY RECEIPTS ON TWO SINGLE-ZONE ROUTES FROM AUG. 1, 1920, TO JAN. 19, 1921, SHOWING HOW MORE FREQUENT SERVICE INCREASES PASSENGER REVENUES a corresponding reduction in the base rate might be advantageous in retaining the present riders and at the same time creating new traffic.

WHAT OCCURRED WITH EARLIER FARE CHANGES

The results from the earlier fare changes in the order of their occurrence follows:

First change—On Sept. 1, 1916, the labor tickets, so called, which provided a 10-cent ride for 5 cents during certain hours and the full fare tickets that had been sold in lots of 100 for $4.50 were abolished and a new ticket was put on sale at the rate of 21 for $1. Roughly speaking, the 4.5-cent zone fare ticket was succeeded by a 4.7-cent rate. No change was made in the cash fare, which still remained at 5 cents with free transfers, nor was any change made in the length of the fare zones. From a traffic standpoint the first month's operations compared with the previous month showed a gain in revenue zone passenger traffic of 2.22 per cent, although the revenues increased but 4.35 per cent.

Second change—On Jan. 26, 1918, the base rate of fare per zone was increased to 6 cents and all tickets abolished. No change was made in transfer privileges nor in zone lengths. For the property as a whole, the results of the first month's operation under this fare increase showed a 2.34 per cent loss in the number of revenue zone passengers carried but a gain in revenue of 14.95 per cent.

Third change—On Sept. 6, 1918, the zone base rate of fare was further increased to 7 cents. No change, however, was made in transfer privileges or zone limits. A comparison of the first month's operations with the previous month shows that again there was no appreciable change in the number of revenue zone passengers carried. The corresponding change in revenue was 10.58 per cent. Looked at in a different light, the company was carrying in September, 1918, daily an average of 25,523 revenue zone passengers at 7 cents per zone as against 21,445 prior to the first change in fares, Sept. 1, 1916. However, as there had been a 75 per cent increase in fare for a portion of the car riders in the same period the average daily receipts jumped from $1,032.54 to $1,339.89, or 29.8 per cent.

TABLE II—RESULTS OF TRAFFIC SURVEY BY ZONES

Zones	1	2	3	4	5	6	7	8	9	All
Passengers on	13,154	2,340	319	87	2	...	..	..	..	15,902
Passengers off	5,510	7,004	2,380	591	208	136	44	25	11	15,909
Total passengers	18,664	9,344	2,699	678	210	136	44	25	11	31,801

Total passengers boarding car within limits of Beaver Falls borough (Twenty-sixth Street to Beaver Falls-Brighton station) who:

Rode to Beaver	387
Rode from New Brighton to Beaver	241

Fourth change—On Dec. 1, 1919, the whole fare scheme was changed as already mentioned, and the length of the zones changed to approximately 2 miles with the base fare set at 5 cents. The immediate results were below expectations. The first month's operations, December, 1919, compared on an average daily basis with November, 1919, showed a gain in revenue of 4.58 per cent. January results were below December and February was slightly better than January. March, however, showed up more nearly the anticipated gain; in other words, 15.1 per cent over the corresponding month of the previous year.

Attention is called to the figures for April, 1920, as compared with April, 1919. The 5-cent fare evidently was creating new riders. The increase in zone passengers on the Beaver Valley Lines was 24.29 per cent and on the Pittsburgh & Beaver Lines was 27.56 per cent. Table III as well as the chart depict clearly the effect of the various fare changes as it influences traffic.

TABLE III—FISCAL AND TRAFFIC RESULTS OF FARE CHANGES, BEAVER VALLEY TRACTION COMPANY ONLY

Daily Averages

Date	Zone Fare	Revenue	Revenue Zone Fares	Transfer and Free Zone Fares	Total Zone Fares	Average Revenue per Car-Mile (Cents)
Aug. 1-31, 1916	(a) 5c	$1,033	21,445	4,807	26,252	28.9
Sept. 1-30, 1916	(d) 5c	1,078	21,923	4,613	26,536	30.0
Per cent change	0.0	+4.35	+2.22	—4.03	+1.08	+3.81
Dec. 26, 1917, to Jan. 25, 1918	( ) 5c	$913	18,911	2,806	21,717	......
Jan. 26, 1918, to Feb. 25, 1918	6c	1,049	18,468	3,203	21,671	......
Per cent change	+20.0	+14.95	—2.34	+14.18	—0.21	......
Aug. 6, 1918, to Sept. 5, 1918	6c	$1,212	20,519	4,382	24,901	......
Sept. 6, 1918, to Oct. 5, 1918	7c	1,340	20,523	4,030	24,553	......
Per cent change	+16.66	+10.58	0.00	+12.42	+14.00	......
Nov. 1, 1919 to Nov. 30, 1919 (c)	7c	1,637	23,420	4,380	28,800	39.8
Dec. 1, 1919, to Dec. 31, 1919 ( )	( ) 5c	1,712	34,455	2,945	37,400	41.1
Per cent change	—28.6	+4.58	+ 46.8	—30.4	+29.82	+3.27

(a) 4½-cent ticket and a two-zone labor ticket for 5 cents are also sold.
(b) 5-zone zones—2 miles average length.
(c) Figures include Pittsburgh & Beaver Street Railway.
(d) Reduced rate zone tickets sold twenty-one for $1.

HOW FARE INCREASES AFFECT THE SHORT HAUL TRAFFIC

A specific proof of the value of adhering to the 5-cent fare as a unit for a short-distance ride when the transfer can be practically eliminated is afforded by a study of the Monaca Route 2004 and the Riverview Crosstown Route 2005, which are respectively 1.5 miles and 2.7 miles long. Even on the latter line most of the riding is done within a haul of 1.25 to 1.5 miles, so that the combination of a twenty-minute headway and a more-than-nickel fare was too great a temptation to walk.

The graphs on pages 672 and 673 show daily and monthly revenues for both routes and are good indices of results obtained by reducing fares for building up short-haul traffic. Tables IV and V also give an idea of what high minimum fares mean on routes when the average length of ride is but little more than a mile.

On Route 2004—between Monaca and Rochester—where the bulk of the riding is one mile or less, the effect of the elimination of labor tickets and the 4½-cent zone ticket caused a loss of 10.52 per cent in total passengers and a 4.46 per cent in revenue. (Even a quarter of a cent increase in fare may loom big to the patron.) The change from 5-cent zones to 6-cent zones in 1918 showed a further decrease in the revenue passengers carried, but due to a 17.5 per cent increase in transfers collected, the traffic handled by the route increased 2.67 per cent and the 20 per cent increase in fare netted an increase of 10.03 per cent in revenue.

The 7-cent fare which became effective in September, 1918, caused losses in total traffic handled of 6.31 per cent, although an increase of 7.08 per cent in revenue was obtained. This loss, however, was greatest in the number of revenue zone passengers carried, which decreased 9.4 per cent. On Dec. 1, 1919, the 7-cent fare with free transfer privilege was reduced to a straight 5-cent zone fare without transfers. This reduction in fare alone stimulated riding as is shown on both charts. Monthly revenues increased from 35 to 40 per cent over the previous year, while the daily revenues showed a corresponding upward tendency from the day of the 5-cent fare. In September safety cars supplanted the

TABLE IV—EFFECT OF FARE INCREASES ON TRAFFIC—ROUTE 2004

Daily Averages

Date	Zone Fares	Revenue	Revenue Zone Fares	Transfer and Free Zone Fares	Total Zone Fares	Average Revenue per Car-Mile (Cents)
Aug. 1—31, 1916..	(a) 5c	$60.60	1,230	655	1,885	36.04
Sept. 1—30, 1916..	(b) 5c	57.90	1,160	527	1,687	34.71
Per cent change...	......	—4.46	—5.68	—19.58	—10.52	—3.15
Dec. 26, 1917 to Jan. 25, 1918....	(b) 5c	$51.69	1,035	349	1,384	......
Jan. 26, 1918 to Feb. 25, 1918....	6c	56.88	1,011	410	1,421	......
Per cent change...	+20.0	+10.03	—2.32	+17.5	+2.67	......
Aug. 6, 1918 to Sept. 5, 1918....	6c	$53.05	926	486	1,412	31.82
Sept. 6. 1918 to Oct. 5, 1918.....	7c	56.81	839	484	1,323	34.17
Per cent change...	+16.67	+7.08	—9.40	—0.50	—6.31	+7.37
Nov. 1—30, 1919..	7c	$76.60	1.101	522	1,623	46 51
Dec. 1—31, 1919..	5c	83.10	1.661	7	1,670	49 86
Per cent change...	—28.6	+8.48	+50.86	—98 66	+2.89	+7.20

(a) A 4½-cent and a two-zone labor ticket for 5 cents are also accepted for fare.
(b) Reduced rate zone tickets sold twenty-one for $1.

two-man cars, with the headway cut in half. This improved service still further increased the traffic so that revenues in October, 1920, the first whole month of safety car operation, were 51 per cent more than the previous year. In December, 1920, the business depression became a factor, due to the industries in the territory served laying off about 27 per cent of their forces. Nevertheless the frequent service in dull times brought more traffic than the longer headways in good times.

Route 2005, although called a crosstown line, is really a roundabout route between New Brighton and Beaver Falls, starting at about the middle of New Brighton (Fourteenth Street) and running to Beaver Falls via Eleventh Street, which is the chief business street of that town.

Similar figures are also given in Table V for Route 2005—the so-called Crosstown Riverview Line. A comparison of the results on these two routes shows conclusively that as fares are increased the traffic losses very often are such that the actual results are not as anticipated. In other words, compared with the traffic handled prior to any change in fares in 1916—and that during the 7-cent fare period—the loss in traffic amounts to 29.82 per cent on Route 2004 and to 22.62 per cent on 2005, while from the revenue standpoint on Route 2004 there is a loss of 6.26 per cent, and on Route 2005 the gain is but 1.14 per cent.

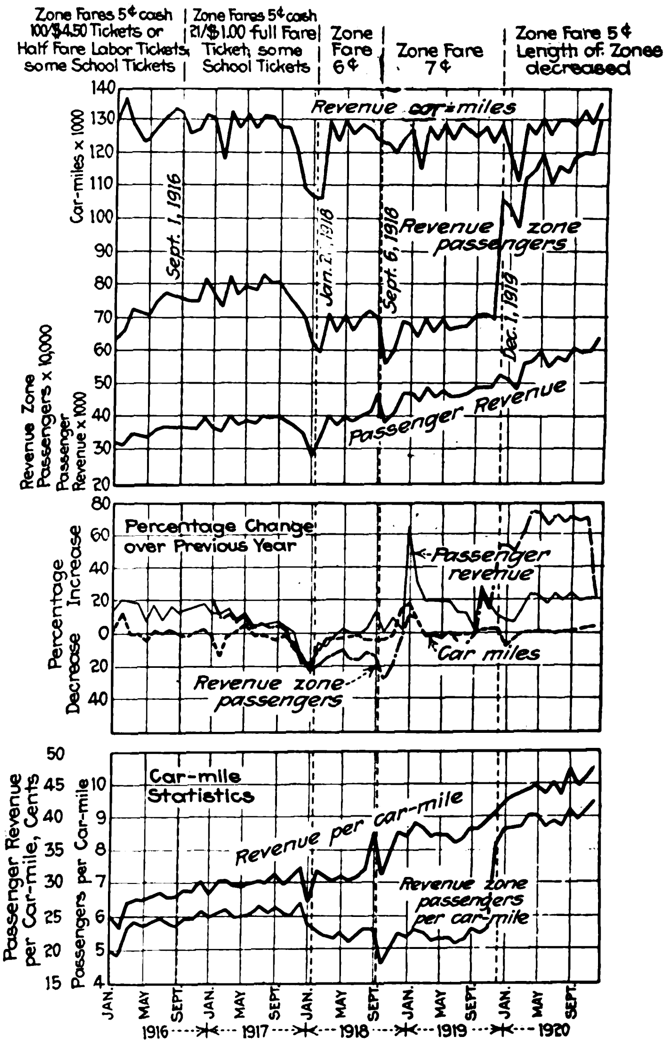
The increased revenue resulting on this route is due not only to the change in fare and improved service but to the fact that with the establishment of the 2-mile 5-cent zones the fare via the main line between New Brighton and Beaver Falls was made 10 cents, and but 5 cents via the roundabout or crosstown line. Thus for January, 1920, as shown on the graph, revenues had increased 56 per cent over the corresponding year, without any improvement being made in the service. This was equivalent to a gain of 95 per cent in traffic. Unfortunately this gain is not stable but decreased month by month until in June, 1920, when the gain over the preceding year was but 14 per cent. Safety car service was installed in September, 1920—with no change in headway. The effect on revenues was an increase of 4.1 per cent in September, 3.86 per cent in October and 9.62 per cent in November over the respective preceding months. In December a tripper was added to the service during the rush hours, which further increased the average daily revenue 15.6 per cent over the month of November. To prove that holiday traffic solely was not the cause of this large increase attention is called to the fact that in January, 1921, the average daily revenue based on the first nineteen days was $99.22. This, then, is equivalent to 11.12 per cent gain over November. However, in January three safety cars were operating on a fifteen-minute normal headway as against a base schedule of twenty minutes and fifteen minutes in the rush hour with trippers in November and December.

TABLE V—SHOWING EFFECT OF FARE INCREASES ON TRAFFIC—ROUTE 2005

Daily Averages

Date	Zone Fares	Revenue	Revenue Zone Fares	Transfer and Free Zone Fares	Total Zone Fares	Average Revenue per Car-Mile (Cents)
Aug. 1-31, 1916...	(a) 5c	$54.32	1,103	187	1,290	18.71
Sept. 1-30, 1916...	(b) 5c	50.73	1,024	172	1,196	17.74
Per cent change...	......	—6.60	—7.17	—8.03	—7.28	—5.17
Dec. 26, 1917 to Jan. 25, 1918....	(b) 5c	$60.16	1,201	108	1,309	......
Jan. 26, 1918 to Feb. 25, 1918....	6c	64.43	1,033	95	1,128	......
Per cent change...	+20.0	+7.11	—13.98	—12.02	—13.82	......
Aug. 6, 1918 to Sept. 5, 1918....	6c	$57.77	981	160	1,141	19.96
Sept. 6, 1918 to Oct. 5, 1918.....	7c	54.94	835	163	998	18.77
Per cent change...	+16.67	—4.91	—17.5	+1.87	—12.55	—5.96
Nov. 1-30, 1919...	7c	$76.23	1 098	145	1,233	26 67
Dec. 1-31, 1919....	5c	84.25	1 769	77	1 840	30 59
Per cent change...	—28.6	+10.52	+61.11	−46.89	†49.2	+14.69

(a) A 4½-cent and a two-zone labor ticket for 5 cents are also accepted for fare.
(b) Reduced rate zone tickets sold twenty-one for $1.



MONTHLY STATISTICS SHOWING EFFECT OF FIVE FARE INCREASES AS APPLIED TO THE WHOLE SYSTEM

From the figures in Tables IV, V and VI it is evident

TABLE VI—RESULTS UNDER FIVE-CENT ZONE FARE

Daily Averages—Route 2004

Date	Zone Fare	Revenue	Revenue Zone Fares	Transfer and Free Zone Fares	Total Zone Passenger
Jan. 1920	5c	$86.11	1,726	None	1,726
Jan. 1919	7c	62.91	918	427	1,345
Per cent change	..	+36.9	+88.2	......	+28.22
Aug. 1920	5c	$71.05	1,430	None	1,430
Aug. 1919	7c	165.27	931	518	1,449
Per cent change	..	+8.86	+53.7	......	—1.27
Oct. 1920	5c	$106.24	2,125	None	2,125
Oct. 1919	7c	70.91	1,016	492	1,508
Per cent change	..	+49.8	+102.2	......	+29.0

Daily Averages—Route 2005

Date	Zone Fare	Revenue	Revenue Zone Fares	Transfer and Free Zone Fares	Total Zone Passenger
Jan. 1920	5c	$85.80	1,716	101	1,817
Jan. 1919	7c	56.13	783	129	912
Per cent change	..	+53.0	+119.0	—21.65	+99.2
Aug. 1920	5c	$75.32	1,522	229	1,751
Aug. 1919	7c	66.61	953	150	1,103
Per cent change	..	+13.08	+59.7	+52.7	+58.6
Oct. 1920	5c	$81.43	1,621	64	1,685
Oct. 1919	7c	73.81	1,059	146	1,205
Per cent change	..	+10.34	+53.2	—56.2	+39.8

that for the short routes under consideration the 5-cent fare is bringing the largest amount of revenue from the largest number of patrons. The Beaver Valley 5-cent short-zone fare scheme was one that took the individual peculiarities of the different routes into consideration instead of applying some one blanket change and consequently the results have proved so gratifying. A significant phenomenon is that the losses in traffic during the various cash-rate increases occurred chiefly during the months of fair weather, and this fair weather traffic did not tend to come back. In other words, had the company gone to higher and higher cash fares its usefulness would have dwindled to the point of carrying only the compulsory maximum-distance rider.

As another example of this tendency it may be pointed out that on the Pittsburgh & Beaver Railway the winter increase, Jan. 26, 1918, from 5 cents to 6 cents, caused no diminution in traffic, whereas the summer change, Sept. 6, 1918, from 6 cents to 7 cents, caused so large a drop in traffic as to produce less revenue comparing the month before and the month after the change in rates.

TABLE VII—CHECKS OF BRIDGE TRAFFIC, BEAVER VALLEY TRACTION COMPANY

	Northbound					Southbound				
Tenth Street Bridge	Car		Auto	Truck	Foot	Car		Auto	Truck	Foot
Thursday, Sept. 4, 6:30 a.m. to 11 p.m.	361		1628	414	661	338		1746	371	692
Friday, Sept. 5, 6:30 a.m. to 10 p.m.	301		1607	509	759	367		2068	530	673
Bridgewater Bridge	Eastbound					Westbound				
Wednesday, Sept. 10, 6 a.m. to 10 p.m.	1678		1629	236	808	1599		1556	254	736
Thursday, Sept. 11, 6 a.m. to 9 p.m.	1454		1449	245	681	1346		1468	214	711
	Northbound					Southbound				
Monaca Bridge	Car	Jitney	Auto	Truck	Foot	Car	Jitney	Auto	Truck	Foot
Monday, Sept. 8, 6 a.m. to 10 p.m.	609	135	658	166	631	667	165	608	168	581
Tuesday, Sept. 9, 6 a.m. to 10 p.m.	626	168	644	152	561	676	151	685	146	544
Overgrade Bridge	Total Pedestrians Only									
Wednesday, Sept. 10, 6 a.m. to 11 p.m.	470									
Thursday, Sept. 11, 6 a.m. to 11 p.m.	550									

As a matter of both fairness and good business the company is willing to split the nickel for customers who have to pass through a short terminal zone. Thus on the 0.73-mile terminal zone between Sassafras Alley, Beaver and Ferry St., Vanport, only 2½ cents is charged, although the tariff calls for 5 cents. In addition to benefiting the passenger who has already paid for one or more 5-cent zones, the company is getting out a 5-cent round-trip ticket for local traffic. This particular stretch is to be paved next year and it will then become a more attractive residential section. The management, in its usual forehanded way, is doing its share to attract new residents by means of the 2.5-cent rate; and when the time is ripe it will give a 10-minute through service instead of turning back half the cars at Ferry Street, Vanport.

Another interesting possibility is that of the Overgrade Bridge between New Brighton and Beaver Falls. The company charges a 2-cent toll for walking over this privately-owned bridge but contemplates a 2½-cent car rate, as this might induce some riders to go on into the next 5-cent zone.

POTENTIAL CUSTOMERS FAR OUTNUMBER THE ACTUAL RIDERS

The foregoing data have demonstrated that the development of differential short-ride fares has increased both traffic and revenue on the system as a whole, and that the increase in service on the short routes have also been a factor in the same direction. The question that remains is: How many more riders can the railway obtain eventually if fares and service are right in the eyes of the public?

To this end several checks of pedestrian and automobile traffic have been made and changes noted in addition to the fluctuations in telephone traffic as noted hereinbefore. In a check made during 1919 at various bridges the thought-provoking figures totaled in Table VII were obtained.

The traffic check on the Tenth Street bridge between Beaver Falls and New Brighton showed that the pedestrian traffic was about double and the automobile passengers about five times the number of street cars users. Naturally, not all of these are street car prospects, but it will be admitted that here is something to work on! The traffic checks on the other bridges do not show up the street railway so badly, but here, too, there are possible customers for the electric railway.

The jitney traffic over the Monaca Bridge is not really a competitor, as it is operated chiefly for the greater convenience of residents of Colona (beyond the terminus of the Monaca Line). A check of the competing Ambridge jitney service made on Friday, Sept. 12, 1919, showed 179 northbound and 192 southbound passengers between 6 a.m. and 7:25 p.m. No complaint has been made by the company concerning this competition, nor will it be necessary, for the improved service is driving them out of business.

In addition to the checks of bridge traffic noted, the management has had an eye upon traffic to and from the steam railroad stations. Frequent traffic checks are made to these points to determine what percentage of the travelers arrive at the depots by trolley. One check recently taken showed that at the Beaver Falls station the trolleys carried 38 per cent of the traffic and that at the Beaver station did 31.6 per cent of the handling.

Street Railway Rate Tariff*

Failure to Allow Proper Base Rates of Fare Results in Practical Confiscation of Railway Property—High Fares Mean More Money Although a Loss in Traffic — Rate of Return Should Exceed the Mere Cost of Money in Order to Allow for Contingencies in the Future

By W. H. SAWYER
President East St. Louis (Ill.) & Suburban Railway

THERE is no particular form or kind of rate schedule which should be seriously proposed for national adoption. Our standard previous to the war was a rate schedule of 5 cents, with the lowest ticket rate and the longest ride possible and still keep wheels turning. Due to this national standard most of us were facing ruin without fully appreciating the situation.

During the past three years municipal authorities have offered in most instances vigorous objection to rate schedules put forward by the railway companies, but in the final analysis their objections were based upon a human but selfish desire to secure needed service at an unfairly low price. In such instances it was necessary that the company make a fight. Few of us are by nature belligerents or looking for a fight. Many of us were criticised because we did fight openly for that which we knew to be right, but when history is written we will be given credit for having saved an essential industry.

PROPERTY HAS BEEN CONFISCATED

Actual statistics regarding the public utility industry are available to the public in complete detail—much more completely than for any other industry. These statistics prove that, on the average, street railway rates, during the war, were such that the properties were actually confiscated. Do not regard this statement as just my opinion. I state it as a fact proved by the statistics. And by "confiscated" I mean that we not only did not secure a "fair return on a fair value," but that from a legal, technical, practical, or moral standpoint our properties as a class were actually confiscated. No street railway in the whole country had rates during the war that produced a really "fair return on a fair value."

As a result, therefore, we emerged from the war broken down in credit, with our properties under-maintained and without the ability properly to serve. Practically every street railway man throughout this country is asking today that past confiscatory conditions be rectified, that there be at least a partial recognition of the splendid service which has been given under most adverse conditions; asking, in short, for a rate of fare and service conditions which will entitle him to the financial credit which is due him, not only to equalize the past inequalities, but primarily so that we may continue to carry forward in the future.

The necessity of establishing and maintaining this credit is of primary importance in any rate discussion. We all want to do that which should be done, but unless a rate carries with it real financial credit, as other business men interpret credit, our hands are tied and we are powerless to "carry on" and serve.

Cleveland's pre-war charge was 3 cents; today on an actual comparative basis, making under a service-at-cost plan the same percentage return, Cleveland is charging double 3 cents or 6 cents. There is no escaping the fact that in Cleveland at least it was necessary actually to more than double the gross revenue in order to obtain the same net income, whereas, if the costs of money were to be taken into account, Cleveland stockholders should be entitled to a net income 50 per cent in excess of the percentage obtaining pre-war.

TEN-CENT BASE RATE NOT TOO HIGH

To meet the needs of the communities served a 10-cent straight fare is not too much today for the average electric railway. Instead of being kept from so charging it would be a real blessing to the communities served if the majority of the electric railways of this country were today on a 10-cent straight fare basis. Those flat-fare cities not on a straight 10-cent basis should, in my personal opinion, be on a basis of 10-cent cash fare with reduced ticket rate. With the idea in mind that investigation regarding cities now charging 10 cents was very pertinent the information bureau of the American Electric Railway Association has within the last few weeks turned over to me answers to revised questionnaire sent out to all of the 123 10-cent cities. One important question asked in the questionnaire was: "In your opinion what was the effect upon traffic of putting into effect a 10-cent fare?" Only three companies reported a decrease in traffic of over 15 per cent due to an increase in fare to 10 cents, and two out of three of those companies jumped from 5 cents direct to 10 cents. Approximately 25 per cent of the companies reported no noticeable decrease whatever. The remainder showed a decrease of from 5 to 15 per cent, and the general average showed that the decrease in traffic due to increasing fare to 10 cents was about 8 per cent, certainly under 10 per cent.

In answer to the question, "Taking everything into consideration, are you better off with a 10-cent fare than if the old rate had remained in force?" the answer was 100 per cent "Yes." Some of them seemed to think we were asking a foolish question; they not only said "yes" but they said "certainly," "assuredly," "unquestionably," "definitely," in fact, all kinds of adjectives; there was no question in their minds. In other words, there is not a city in the country that is charging 10 cents but what needed that 10 cents and but what is getting more revenue than it would at any lower figure.

In the answer to these two questions we get indisputable evidence that a higher rate of fare does produce more revenue, thus giving a finality to all previously submitted facts; that unfair, strawman bugaboo, that a higher rate of fare will not produce more revenue, cannot be flaunted any more. Many a company has been unfairly refused a proper increase due to this excuse being put forth by the politician to prevent fair rates being granted. Commissions have refused increase in rates because, so they said, they had grave doubts as to whether increased rates would give increased revenue.

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*Abstract of paper presented before Wisconsin Electrical Association, Milwaukee, March 24, 1921.

If there are still those who maintain the evidence is either misleading or incorrect, I would ask that they await further statistics from the service-at-cost cities. When the time comes that fares are reduced in Cleveland, Cincinnati, or Youngstown, and the reduced rate of fare produces greater revenue than the higher rate of fare then we will commence to have evidence that a higher fare produces lower revenue.

Please pardon my taking so much time to prove that more money means more money, but this unfair weapon has been used against us in the past and we must not allow it to continue. Please also appreciate that I am not arguing for or against the zone system with reduced fare for reduced length of ride.

SINGLE COIN FARE AND TICKETS URGED

Assuming that some companies do not now actually need a straight 10-cent cash fare, or assuming that the day will come when the majority of the companies will not need a straight 10-cent fare, which is the preferable fare, a 10-cent cash fare with reduced rate tickets or an equivalent fare producing the same revenue in odd cents, with or without reduced ticket rates?

The return of the questionnaire by cities operated at 10 cents, either straight fare or with reduced ticket rate, brought out definitely that every executive with one exception believed from his experience that a 10-cent cash fare with reduced ticket rate was far preferable to an equivalent flat rate fare even without tickets. As a concrete example, they considered it was better for the company and the public to charge 10 cents cash, with four tickets for 30 cents, than it was to charge an equivalent straight fare, which we will assume to be 8 cents; and they, of course, considered it far preferable to charge 10 cents cash with reduced ticket rate than to charge an odd penny straight fare with less reduced ticket rate producing the same revenue. Summing up the fare situation as I glean it from the statistics and also from these questionnaires we find:

1. Zone systems are in successful operation in several places and are more satisfactory in these places to the company and to the public than a flat-fare system producing the same revenue.
2. ' one systems are objectionable to the public in most localities and the primary reason is not that the zone system proposed is inequitable or unfair *per se* but that it is believed to be discriminatory compared with existing flat-rate system under which the communities have been developed.
3. The minimum charge in any zone should not, under present conditions, be less than 5 cents.
4. Increased fare has unquestionably produced more revenue and a reduction in rates of fare will produce less revenue.
5. It is not to be expected that further substantial increases will be granted except in exceptional cases, but even with decreased operating costs the industry cannot give needed services if fares are reduced.
6. The rate of fare should not be kept unnecessarily high so as to force the car rider to pay taxes belonging to the general public. I refer to payments by street railway companies for paving and sprinkling, payments of a percentage of their revenue to the city and to all other payments which would not be a part of the cost of service—if measured by the same standards as other business.
7. In these days of registering fare boxes and of locked box fare boxes, a reduced rate ticket or token fare is, where financially practicable, preferable to the company and to the public.
8. A 10-cent cash fare, a standard coin, with reduced rate ticket or token is preferable to odd penny cash fare, with or without reduced ticket rate, producing the same revenue.

The questionnaire also showed that these executives believed that a 10-cent cash fare with reduced rate ticket was desired by their customers in preference to the lower flat rate odd penny fare.

I have given you the consensus of opinion of the committee on rates of fare of the American Electric Railway Association; I have given you the consensus of opinion of executives with whom I have been in communication throughout the country, but the fact still remains that the American Electric Railway Association as an association has no national code as to fare schedules. Its individual members have different ideas as to how the problems should be worked out in their different localities; that is but right and meet. Different conditions prevail in different cities, and even were the conditions the same, I say again the people have a right not only to the service they desire but to pay for that service in the way they desire to pay, provided they do pay the cost of service, and by cost of service I mean not only the cost of labor and materials and taxes, but the fair cost of the money necessary in the business. The money we return to our security holders will buy no more than the same amount of money accruing to them from other business and so they naturally and rightfully expect a fair return on their street railway investment the same as from any other investment. This they have not secured in the past and they must have it in the future or with credit gone we cannot function.

RATE OF RETURN MUST EXCEED THE COST OF MONEY

Just one more phase of this credit question—that is the question of fair return to street railway security owners.

The investor in the future knows that there are plenty of other opportunities to invest money in really paying investments. He knows by experience that the big portion of street railway investments have in the past not been protected and that the properties have been confiscated. He knows that the street railway investor carried during the war a load so unfair that it would have broken down and put out of business any other but this most essential business. He knows that based on today's earnings the street railway investments as a class are undesirable. He won't be caught again—he will protect himself by investing his money elsewhere unless conditions change.

You and I have no need to worry about our jobs. Any man who can successfully operate an electric railway need have no fear of a position in other fields of industry.

So, "why worry?" The investor can take care of himself; the electric railway men can take care of themselves. Why try to save an industry the credit of which has been allowed to become impaired? Why? Because it is our duty.

You may think you have talked until you were hoarse, written until your arms ached, worked until you were worn out in body and mind, but all the work up to the present has been to salvage existing investments, to protect and continue for the public existing service. Heroic sacrificing work has been done, an essential industry has been saved, but of what avail if allowed only to continue as at present, merely to exist.

New money is needed so that our electric railways may grow and expand to meet the needs of the civic communities which cannot grow and prosper except as the electric railways keep pace with their needs and requirements. Electric railway operators can carry on the good work to a successful completion so that electric railway investments may be sought for and thus make possible the improved service and the improved facilities urgently needed. Electric railway rates must be placed and kept on a basis that are comparative with rates to other business.

"A fair return on a fair value" is all the investor asks, but "a fair return on a fair value" as of today only will not bring real credit. Before a rate of fare is lowered some of the past deficiency in rate of return must be compensated for and there must be some surplus to allow for contingencies in the future. Then will investors have confidence in new electric railway securities.

The rate of fare on an electric railway should be such that:

1. The riding public may be given service which all things considered is satisfactory to them.
2. Fair wages, commensurate with wages in other industries, must be paid.
3. The return to the investor is such that new investors will willingly invest new money in new securities to finance additional facilities and equipment.

The Madison Design of One-Man Car*

BY DUDLEY MONTGOMERY

Vice-President Madison (Wis.) Railways

THE Madison Railways have operated standard Birney safety cars for about two years and have now developed a design of one-man car which is being used in an endeavor to prevent crowding at the front end, which has resulted in considerable delay in operation. Our experience indicates that a 26-in. aisle is the minimum that should be used if free movement of passengers in a car is to be obtained. With any narrower aisle, passengers will not attempt to pass except under necessity.

The new design of car as used in Madison is 4 in. wider and 2 ft. longer than the standard Birney car and has a double-door opening 15 in. wide divided into two passageways by a stanchion. The comparative weight of the car is 17,200 lb., as against 15,800 lb. for the standard car. Three criticisms of the new design which were advanced before construction were its additional weight, cost of heating and loss of fares due to the double-door opening. Tests show that the power consumption per 100 lb. per 100 miles varies from 0.3 kw.-hr. to 0.55 kw.-hr. If the car runs 165 miles a day and has a difference in weight of 1,400 lb., the saving for the lighter car is only about 7 kw.-hr. per day. The heat required in the new car is about 160 kw.-hr. per day of eighteen hours in severe weather. The loss of fares is negligible as the operator is not over 3 ft. from passengers entering at the exit door, and at points of heavy loading stands up to make the fare collection.

So far no criticism has been received to this design of car from the public, railroad commission, council, or railway company's employees. We do not feel that the present double-door arrangement will stop congestion at the front end of the present standard car. The widening of the 22-in. aisle is just as important. I am willing to go as far as possible to accomplish standard construction of cars, but I feel that we must have a car that can be sold to our patrons.

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*Paper presented before Wisconsin Electrical Association, Milwaukee, March 24, 1921.

London Companies Organize

Outline of the Comprehensive Scheme of Organization of the London Underground and Allied Companies, with Duties of the Different Departments, Made Effective This Year

A SCHEMATIC diagram of the organization of the Underground Electric Railways of London and allied companies, effective Feb. 1, 1921, is given in the chart on page 680. The organization embraces ten companies as follows: (1) Underground Electric Railways of London, (2) Metropolitan District Railway, (3) London Electric Railway, (4) City & South London Railway, (5) Central London Railway, (6) London General Omnibus Company, (7) London & Suburban Traction Company, (8) Metropolitan Electric Tramways, (9) London United Tramways, (10) South Metropolitan Electric Tramways & Lighting Company. In the outline which follows No. 1 is referred to as the "underground company," 2, 3, 4 and 5 as the "railways," 2, 3, 4, 5 and 6 as the "common fund group," 7 as the "traction company" and 8, 9 and 10 as the "tramways." When no limitation is indicated reference is made to all companies.

There is a single chairman and managing director for the underground company, each of the companies in the common fund group and the traction company. This is the Right Hon. Lord Ashfield. There are separate and distinct chairmen for each of the companies in the tramways group. The assistant managing directors for departments A and B are, in charge of department A, Frank Pick, and in charge of department B, H. E. Blain. A general outline of the duties of the different departments shown in the chart is given below:

Department A.—In charge of an assistant managing director (Frank Pick). This department is charged with responsibility for:

- (a) The accounting, audit and statistical work (common fund companies).
- (b) The determination of fares, rates and charges.
- (c) The development and establishment of routes and services and the co-ordination of traffic facilities.
- (d) The publicity and advertising.
- (e) The purchase and supply of stores and materials and the sale of obsolete stores, spare parts and scrap.
- (f) The legal and parliamentary work.
- (g) Negotiations, arrangements and agreements (subject to any directions of the chairman).

Department B.—In charge of an assistant managing director (H. E. Blain). This department is charged with responsibility for:

- (a) The inspection, adjustment, cleaning and oiling of the rolling stock, lifts and escalators of the railways, with the supervision and control of the depots, yards and sidings.

(b) The operation of the railways and control of stations.
(c) The supervision and control of the motor omnibuses, with the garages and sheds.
(d) The operation of the system of motor routes and stands.
(e) The preparation and institution of all service and duty schedules.
(f) The work of the chief passenger agent, including the supply and issue of tickets.
(g) The settlement of claims arising out of accidents, all companies (and other claims as may be directed by the chairman).
(h) The review of wages, hours, conditions of service and similar questions affecting the staffs as a whole to secure uniformity and the supervision of welfare work.
(i) Communications with the public arising out of the operation of the companies.
(j) The "safety first" work (all companies).

Department C (Railways).—In charge of the director of construction (railways) (Z. E. Knapp). This department is charged with responsibility for:
(a) The generation and distribution of power, including the control and supervision of the power-house, sub-stations and all equipment used in connection therewith.
(b) The supervision and control of all new works, new construction and new equipment (including constructional works for the omnibus company in consultation with the chief engineer, L. G. O. C.).
(c) The conduct of engineering research and investigation on behalf of the railways.

Department D (Omnibuses).—In charge of a chief engineer (L. G. O. C.) (G. E. Shave). This department is charged with responsibility for:
(a) The renewal of omnibuses and the construction of new and additional omnibuses.
(b) The overhaul and maintenance of omnibuses in the new central depot and in the coach factories.
(c) The licensing of omnibuses and all questions arising thereout.
(d) The central stores.
(e) Engineering research and investigation work in connection with omnibuses.
(f) Fuel research.

Department E (Railways).—In charge of a chief engineer (railways) (A. R. Cooper). This department is charged with responsibility for:
(a) The maintenance and renewal of the railways and their equipment.
(b) The maintenance and renewal of the rolling stock, lifts and escalators used upon the railways.
(c) The maintenance and renewal of all buildings, whether for railways, tramways or motor omnibuses.

The chief engineer is also responsible to the director of construction (railways) for any new works in connection with existing railways.

Department F (Tramways).—In charge of a general manager (tramways) (C. J. Spencer). This department is charged with responsibility for all questions arising out of the maintenance and operation of the tramways as defined above under Departments A, B and C, except:
(a) The determination of fares, rates and charges.
(b) The co-ordination of traffic facilities.
(c) The publicity and advertising.
(d) The purchase and supply of stores and materials.
(e) The parliamentary work.
(f) The settlement of claims arising out of accidents.
(g) The maintenance and renewal of buildings, which shall be dealt with in Department A for (a) to (e) inclusive, in Department B for (f), and in Department E for (g), in consultation and agreement with the general manager (tramways).

Department G (Common Fund Group).—In charge of a secretary and treasurer (J. C. Mitchell). This department is charged with responsibility for:
(a) The customary secretarial work of the companies.
(b) The financial work.
(c) The administration of the estates and surplus property of the companies.
(d) The insurance work of all descriptions.
(e) The management on behalf of the companies of the superannuation, pension and other funds instituted by the companies.

Department H (Tramways Group).—In charge of a secretary and treasurer (E. Boys). This department is charged with responsibility for:
(a) The customary secretarial work of the companies.
(b) The financial work.
(c) The administration of the estates and surplus property of the companies.
(d) The insurance work, except national health and unemployment insurance dealt with by the general manager (tramways).
(e) The management on behalf of the companies of the superannuation, pension and other funds instituted by the companies.

Note.—In order to insure co-ordination of methods, this department shall, as far as practicable, be governed by the procedure and requirements laid down for the common fund group.

The purchasing agent in New York for the properties mentioned remains the National Railway Appliance Company, New York.

A pamphlet has been issued giving the duties of the various departments in detail.

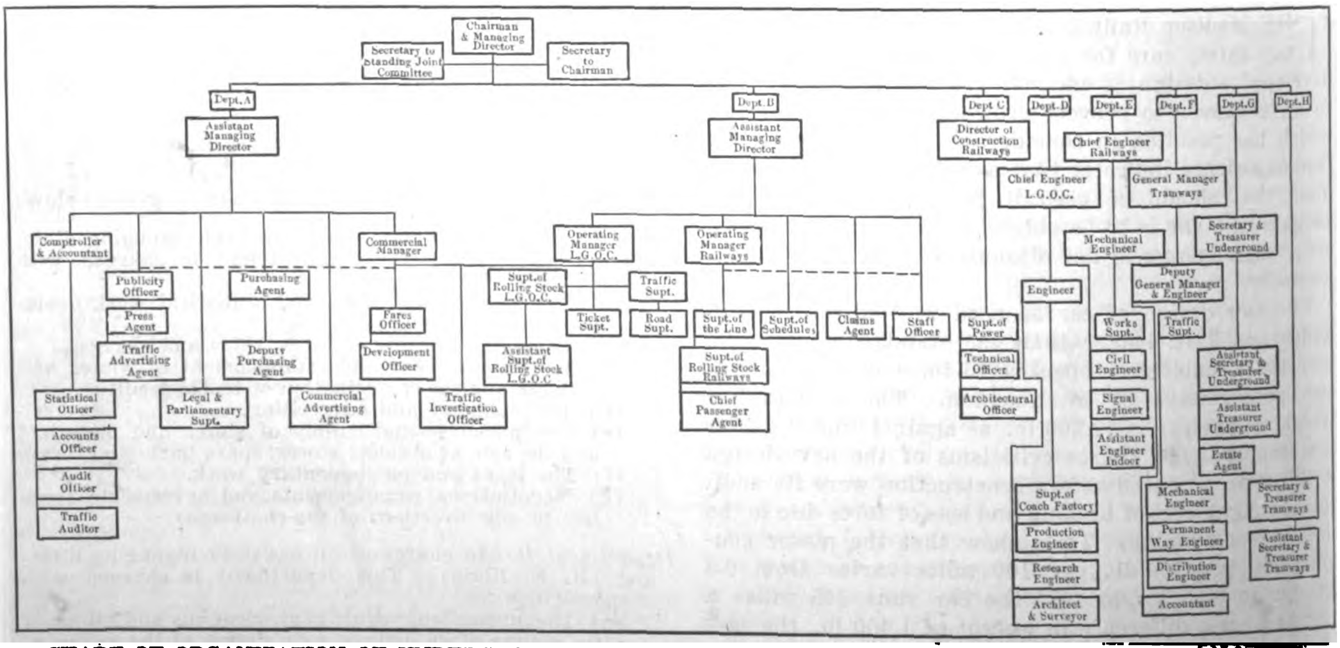
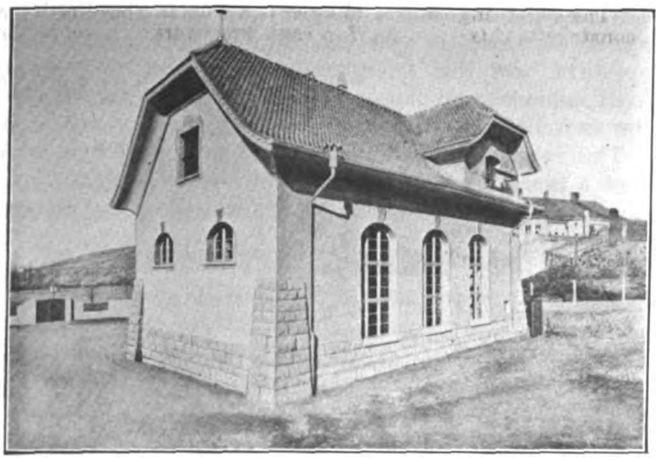
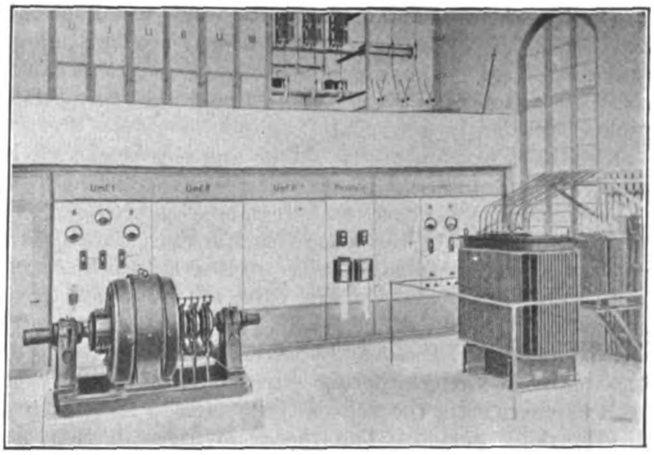

Chairman & Managing Director
Secretary to Standing Joint Committee
Secretary to Chairman
Dept. A
Assistant Managing Director
Comptroller & Accountant
Statistical Officer
Accounts Officer
Audit Officer
Traffic Auditor
Publicity Officer
Press Agent
Traffic Advertising Agent
Purchasing Agent
Deputy Purchasing Agent
Legal & Parliamentary Supt.
Commercial Advertising Agent
Commercial Manager
Fares Officer
Development Officer
Traffic Investigation Officer
Dept. B
Assistant Managing Director
Operating Manager L.G.O.C.
Supt. of Rolling Stock L.G.O.C.
Assistant Supt. of Rolling Stock L.G.O.C.
Ticket Supt.
Traffic Supt.
Road Supt.
Operating Manager Railways
Supt. of the Line
Supt. of Rolling Stock Railways
Chief Passenger Agent
Supt. of Schedules
Claims Agent
Staff Officer
Dept. C
Director of Construction Railways
Supt. of Power
Technical Officer
Architectural Officer
Dept. D
Chief Engineer L.G.O.C.
Engineer
Supt. of Coach Factory
Production Engineer
Research Engineer
Architect & Surveyor
Dept. E
Chief Engineer Railways
Mechanical Engineer
Works Supt.
Civil Engineer
Signal Engineer
Assistant Engineer Indoor
Dept. F
General Manager Tramways
Deputy General Manager & Engineer
Traffic Supt.
Mechanical Engineer
Permanent Way Engineer
Distribution Engineer
Accountant
Dept. G
Secretary & Treasurer Underground
Assistant Secretary & Treasurer Underground
Assistant Treasurer Underground
Estate Agent
Dept. H
Secretary & Treasurer Tramways
Assistant Secretary & Treasurer Tramways

CHART OF ORGANIZATION OF UNDERGROUND ELECTRIC RAILWAYS COMPANY OF LONDON AND AFFILIATED RAILWAY, TRAMWAY AND BUS COMPANIES



RIEHEN AUTOMATIC SUBSTATION, NEAR BASEL



INTERIOR VIEW IN RIEHEN AUTOMATIC SUBSTATION

Automatic Substation in Switzerland

Manufacturers of Electrical Apparatus Have Devised Control to Secure Simplicity, Reliability in Operation and Accessibility for Repair—Devices Differ from Those in Use in This Country, One Feature Being the Provision for Starting and Stopping by Hand and by Time Clock

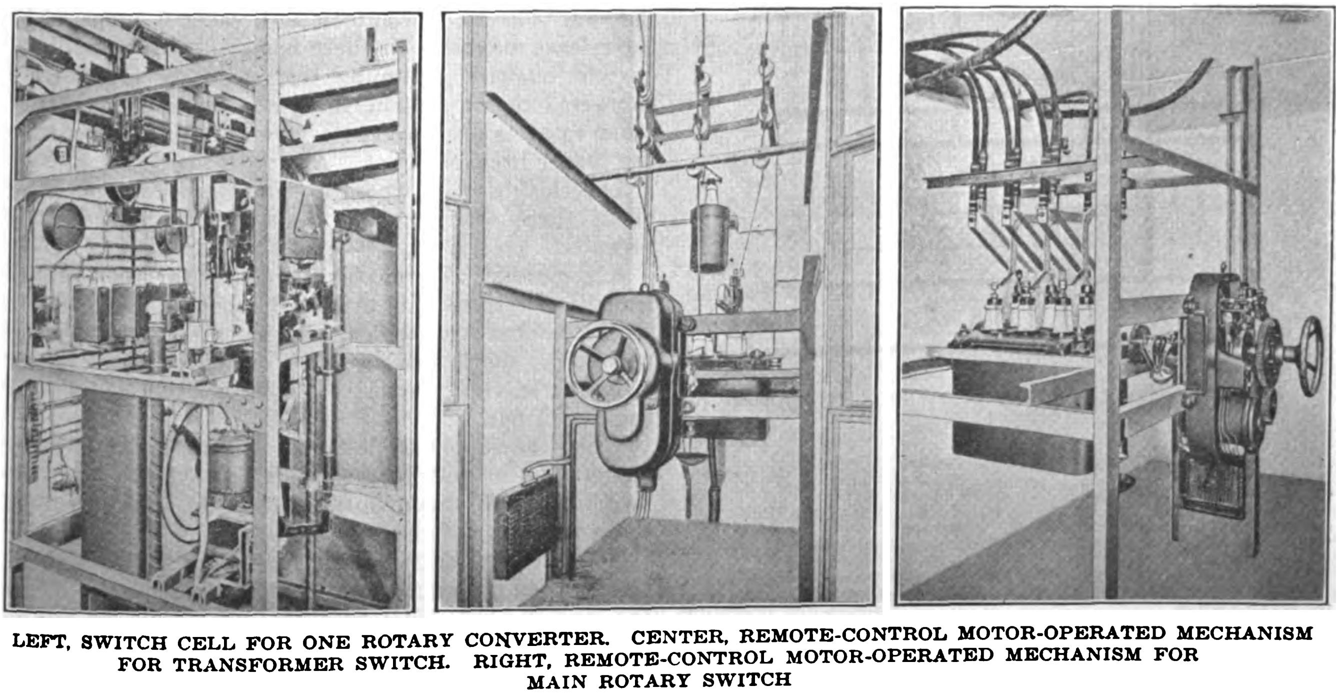
IN VIEW of the wide application in this country of automatic control of electric railway substation apparatus the readers of the ELECTRIC RAILWAY JOURNAL will be interested in developments in the same line abroad. Brown, Boveri & Company of Baden, Switzerland, have installed an equipment of this kind at Riehen near Basel, in a substation which supplies 600-volt power to the electric railway line between Basel and Lorrach, and will later feed certain projected tramway lines. The devices used differ considerably from those usual in this country and they are covered by patents. One salient difference is the provision for starting and stopping by hand and time clock, the control taking care of all operating conditions otherwise.

The Riehen substation is part of the Basel Electricity Works system, and it was built before the decision was reached to put in automatic equipment. It contains a 250-kw., six-phase, 50-cycle rotary converter equipped with a speed-limit device, transformer, regulative reactance coil, starting switch and field rheostats. Provision was made in the design for two additional rotaries of at least 250-kw. capacity each.

This substation secures its power supply from the Augst plant at 6,300 volts.

TIME SWITCH IS USED MORNING AND EVENING

The essential parts of the automatic control equipment are as follows: Time switch for cutting equipment in or out at a predetermined time; transformer and starting switches; switch-operating devices; relays of various kinds, namely, overload, time-limit, polarized, no-voltage, feeder; over-speed centrifugal switch,

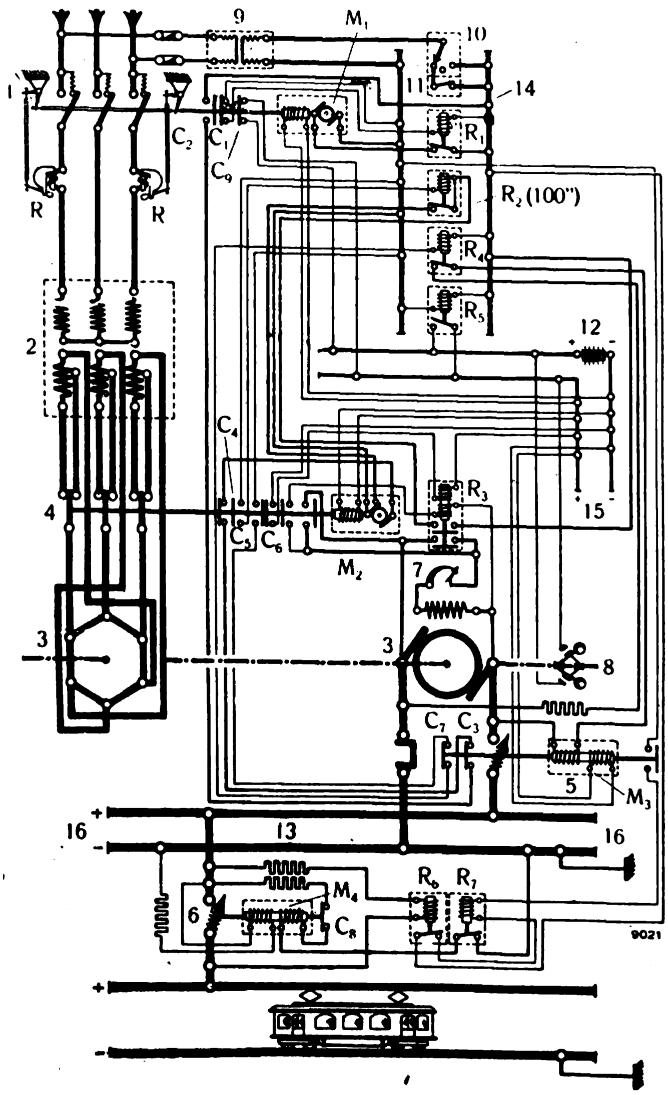


LEFT, SWITCH CELL FOR ONE ROTARY CONVERTER. CENTER, REMOTE-CONTROL MOTOR-OPERATED MECHANISM FOR TRANSFORMER SWITCH. RIGHT, REMOTE-CONTROL MOTOR-OPERATED MECHANISM FOR MAIN ROTARY SWITCH auxiliary battery and, of course, the usual circuit breakers, etc. Essentially these devices are built along standard lines. The operating devices for the heavy switches are motor-driven, solenoid operation being used where sufficiently powerful.

For the operation of the relays and electrical switchgear, special auxiliary sources are required as follows:

A small single-phase transformer connected to the primary winding of the main transformer. To this are connected the operating devices of the alternating current switchgear, the voltage coils of the time-circuit relays and the no-voltage relays.

A small portable storage battery is used for tripping the main switch supplying current to the rotary as well as energizing the coil of the polarized relay during the starting period. The feeder switches have a no-voltage release. The energy for operating the direct current contactors is obtained from the rotary itself. For the first start in the morning and for the shutting down in the evening a simple time switch is used by means of which, in starting, the "in" bus is put under pressure, and this in turn energizes the relays in a fixed sequence and causes the closing of the corresponding switches.



CONNECTION DIAGRAM FOR SWISS AUTOMATIC SUBSTATION

1. Transformer primary switch
2. Transformer
3. Synchronous converter
4. Starting switch
5. Machine automatic breaker
6. Feeder automatic breaker
7. Field rheostat
8. Overspeed centrifugal switch
9. Auxiliary transformer
10. Hand switch
11. Time switch
12. Auxiliary battery
13. Resistor
14. Busbar "in"
15. Busbar "out"
16. Station busbar

R = Overload relay
R_1, R_2, R_4, R_7 = Time limit relays
R_3 = Polarized relay
R_5 = No-voltage relay
R_6 = Feeder relay
C_1-C_9 = Contacts
M_1, M_2 = Motor-switch operating device
M_3, M_4 = Solenoid-switch operating device

The release mechanism of the main switch is connected across the bus system, which after the functioning of the release system is connected to the battery voltage.

HOW THE APPARATUS FUNCTIONS

The switching sequence for cutting in and out, and for the resumption of service after a direct current or alternating current disturbance (see circuit diagram for reference numbers) is as follows:

Time switch 11 closes (or hand switch 10 is closed), putting the "in" busbar 14 under pressure. After about three seconds, time-limit relay *R*-1 connects to this busbar the motor-operating mechanism of the main switch *M*-1.

Transformer switch 1 then closes, closing auxiliary contacts *C*-2 and opening *C*-1 and *C*-9.

With the contacts *C*-2, *C*-3 and *C*-4 closed the starting circuit of the motor-mechanism *M*-2 is closed and the starting switch is brought to the starting (right-hand) position.

In this position of the starting switch the time-limit relay R_2 is put under pressure through contacts C_8, and closes its own contacts in a maximum of about 100 seconds. In about thirty seconds the rotary has reached synchronous speed. Should the polarity be incorrect, shortly before the machine comes into synchronism, the polarized relay R_3 opens up the excitation circuit of the rotary. Time-limit relay immediately resets itself. Thus the time-limit relay R_2 closes its contacts only when the rotary polarity is correct; *i.e.*, when the polarized relay R_3 remains permanently closed during the time required by the setting of the time relay (fifty to 100 seconds). Then the contacts of relay R_2 close the "running" contacts of the motor mechanism M_2.

If the transformer circuit breaker is opened due to a heavy overload, having been tripped by means of the series overload time-limit release *R*, the breaker goes back to its no-voltage position, closing C_1 and C_9.

The closing of C_9 connects the storage battery 12 to the "out" bus 15, and automatic breaker 5 is opened by the release magnet. As there is no voltage on the direct current busbars, assuming that no other rotaries are connected to the system, the feeder breaker opens. If other rotaries are involved a reverse-current relay trips the feeder breaker.

The closing of C_1 operates time-limit relay R_1 after about three seconds, and the switching-in process is repeated.

A somewhat different arrangement for the overload time-limit release *R* is to have it operate in connection with a ratchet relay which, after opening up three times within a short period, will open the transformer switches, leaving them in the open position and locking the circuit out.

When the supply of power to the substation is interrupted, the no-voltage release relay R_5 trips all of the switches and shuts down the entire station until normal line voltage is resumed.

The effect of heavy direct current overload or short-circuit is to open automatic feeder breaker 6 and finally the machine automatic breaker 5 will come out due to overload release. The latter will then be reclosed through contacts C_7 after the operation of relay R_4 in about three seconds. The feeder automatic breaker "switches in" when the contacts of feeder relays R_6 and R_7 close, *i.e.*, when the feeder resistance comes in.

The contacts of time clock 11, which are closed during the daytime, are opened during the evening for a predetermined period. This causes no-voltage relay R_8 to operate, putting pressure on busbar 15. Switches 1. 4, 5 and 6 then come out.

SOME DETAILS OF THE EQUIPMENT

Polarized relay R_3 is a direct-current relay with two current coils having the same number of ampere-turns, electrically separate. It has two contacts which close when the armature is attracted. One coil is connected to the auxiliary battery 12 and the other to the terminals of the rotary. One contact connects the field circuit of the converter while the second connects the pressure coil of the time-limit relay R_3 to the bus 14, or disconnects it. As soon as the starting switch 4 comes in it connects the first coil to the direct-current battery circuit and the second coil to the alternating-current circuit of the rotary field. When the converter approaches synchronism and its "slip" approaches zero the frequency of the alternating current impressed upon the field diminishes and the current in the field changes to direct current when the machine is at synchronism. This may or may not be in the proper direction, but if it is not the resultant field in the relay is zero and the armature drops for about half a second, permitting it to "slip a pole," repeating the operation if necessary, which in general is not.

As previously explained, the cutting in of the feeder switch depends on the feeder resistance, *i.e.*, the resistance in the outgoing line cannot be less than a certain amount. The control of the "switching in" of the feeder resistance is obtained by shunting feeder switch 6 by feeder relay R_6. If the feeder resistance is less than a certain value, a current flows through the current coil of relay R_6 limited by a series resistance 13, which current attracts the armature of the direct-current relay. By the attraction of armature R_6 the coil of relay R_7 is disconnected and its contacts and the starting circuit of contactor M_4 are not closed. As soon as the feeder resistance permits "switching in," the contacts of relay R_6 close and relay R_7 switches in the feeder breaker after a fixed time. This arrangement prevents cutting in the feeder circuit during so-called oscillating short circuits.

Reorganizing After a Strike

Intensive Training Campaign of Trainmen Carried On in Denver Subsequent to Strike Results in Very Prompt Restoration of Service Reliability and Efficiency—Auditorium Meetings Brought to the Attention of Men by Means of Large Posters and Mimeographed Notices Which Were Given Out at the Division Offices

IRREGULARITY of service, inefficiency of trainmen and all manner of trouble are the aftermath faced by a company which undertakes a complete new organization in the transportation department after an unworthy strike. It is often a matter of a year or more before the transportation department will be functioning normally and the trainmen equipped with the proper knowledge of rules, respect for discipline and understanding of what goes to make up good service. The efforts of the Denver (Col.) Tramway to overcome the deficiency of a new transportation organization through an intensive training campaign as directed by Edward A. West, general superintendent, will therefore be of general interest.

On Aug. 1, 1920, the employees of the Denver company went on strike. The company was successful in replacing the strikers with new employees, but the majority of them were inexperienced in street railway work. Because of the dearth of instructors and the urgent need of placing cars in service as rapidly as possible, it was impossible to give these men the usual thorough instruction which is had under normal conditions. The result was the common one under such circumstances, that the company was operating cars with a force of men who were not familiar with many of the details of their work. Conductors were able to collect fares and give the motorman signals, but were unable to make out trip sheets properly and did not understand the transfer system. They were not thoroughly familiar with the city and were therefore unable to direct passengers properly or issue and collect transfers readily. Motormen were able to operate cars as long as nothing went wrong, but in doing so they were abusing the motors and equipment. They did not know how to keep the car on the line in case of trouble and were not familiar with the danger points requiring special operating precaution. Furthermore, trainmen were unable to co-operate with one another because of ignorance as to how this was done or the need for it, and many delays and unreliable service resulted.

It was evident that individual instruction of the entire force would be slow and expensive, and the management therefore decided to give the men intensive instruction in groups, thus economizing the time of the instructors to a great extent and making it possible to reach the entire force in a much shorter length of time.

The subjects to be presented to the trainmen fell into two divisions, requiring different methods of instruction. The first of these divisions included all of those subjects which could be presented to the men in purely lecture form and readily impressed on their minds without resorting to "quizzing." The second division included those subjects of a more highly technical nature which could not be made clear without more or less individual instruction accompanied by examinations and opportunity for the men to ask questions.

All of the subjects in the first division were presented at general meetings of all trainmen in the Tramway Building Auditorium, the speaker presenting his subject only twice on the one day. For the convenience of the men, these meetings were divided into two sections, one in the morning at 10:30 and the other in the evening at 7:30, thus giving practically all men an opportunity to attend.

The subjects of the second division were presented to small groups of trainmen at the several division headquarters and each class was conducted several times at each division. Schedules were so arranged that there were three times of meeting during the day: 10:30 to 11:30 a.m. for night men; 2:30 to 3:30 p.m. for split run men and a small proportion of night and day men, and 7:30 to 8:30 p.m. for day men. Special times were set for a small number of "matinee" men, unable to attend at any of the above periods. Each class, when started, continued to attend at the same time every day until the complete course was covered. Each man was required to take an examination after having completed the entire course of the division meetings.

The arrangement of meetings and subject matter covered is indicated in the following program:

AUDITORIUM MEETINGS

Date	Subject	Speaker
Sept. 16	Day, night and split boards	J. L. Adams
	Accident reports	S. G. Shaw
Oct. 6 and 11	Transfers	F. W. Werner
Oct. 25	The instruction of new men	W. L. Abernathy
	The supervisory staff	B. V. Polkinghorne
Oct. 29	Naming and numbering streets	F. W. Werner
Nov. 5	The treatment of passengers	J. L. Adams
Nov. 18	Organization and discipline	E. A. West
Dec. 2	The prevention of accidents	H. S. Robertson
Dec. 9	Relation between employer and employed	E. Stenger
Dec. 16	Fire runs	Fire Chief Healy
	The traffic ordinance	Traffic Sergeant Hunt

DIVISION MEETINGS FOR CONDUCTORS

Subject	Instructor
Trip sheets and turn-ins	G. H. Brinker
Schedule speeds and running times	H. J. Kuster
Dispatching	B. Busch
Transfers	G. H. Brinker
Drill on rule book	W. L. Abernathy
Examination.	

DIVISION MEETINGS FOR MOTORMEN

Schedule speeds and running times	H. J. Kuster
Dispatching	B. Busch
Equipment	N. R. Love
Handling controller and brake; emergency repairs	A. J. Singer
Speed over special trackwork; dangerous crossings, intersections and hills; electric switches	A. J. Singer
Drill on Rule Book	W. L. Abernathy
Examination.	

Auditorium meetings were brought to the attention of the men by means of large posters, one for each division, and also by means of mimeographed notices which were given out at the division offices. In order to secure maximum attendance, each division superintendent detailed a man to see each trainman on his division and find out which meetings he would attend. This was very helpful in boosting the attendance at the early meetings, but was found to be unnecessary after the men's interest had been aroused.

The division meetings were supplemented by printed material covering the same ground as the meeting. These were handed to the men at the close of each meeting and covered the subject matter for the next meeting. A few days before his meeting, a list was sent to each man of the meetings which he was scheduled to attend, showing the subjects of each meeting, the time, date, place and instructor. At the time of sending these notices out, a roll-call sheet was prepared in quadruplicate, showing the name and number of each man and the meeting with time, place, date and instructor for each class, thus giving a square for each meeting for each man. The original was used by the instructors, the first copy held in case of loss of the original, the second copy used as a record sheet in the office, and the third copy sent to the division superintendent.

A large card was made out for each trainman showing his name, number and division and occupation (motorman or conductor). Assignments were recorded on this card in red. When a man attended a division meeting the date and his grade for the meeting were shown in black, opposite the proper meeting number. Auditorium meetings were shown by stamping the date of the meeting at the bottom of the card with a crown dater. The back was used for road instructions given the man.

As the auditorium meetings were not repeated, the misses were not followed up. If a man missed one of the division meetings, however, he received an assignment to another meeting and a notice was sent to him to this effect. The new assignment was shown on his record card. A copy of the notice to the man was placed in a tickler file to come out on the day after the assigned meeting. In many cases where a man had missed a number of meetings, he was notified to report to the man in charge of schedules and make arrangements for attending. Every man had at least two opportunities to attend, and a large number had more than two opportunities. Notice of each miss was sent to the division superintendent interested.

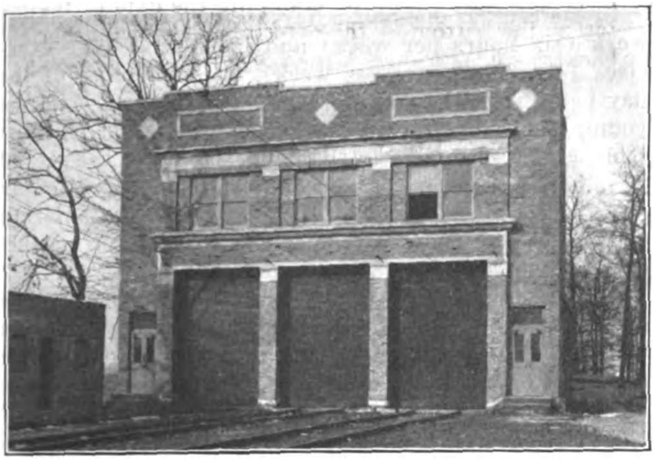
The men were paid for auditorium meetings at the rate of 50 cents per meeting. Division meetings were paid for at the regular rate of the man, for one hour. The reason for this was, when the original plans were made, the day and night split board was in effect, and it was thought that it would be necessary to relieve each man during his time on duty, paying him for the entire time as if he were working. Shortly after the classes were started these runs were discontinued and a straight nine-hour board was put into effect. The result of this was that a large percentage of the men attended the meetings before or after going on duty.

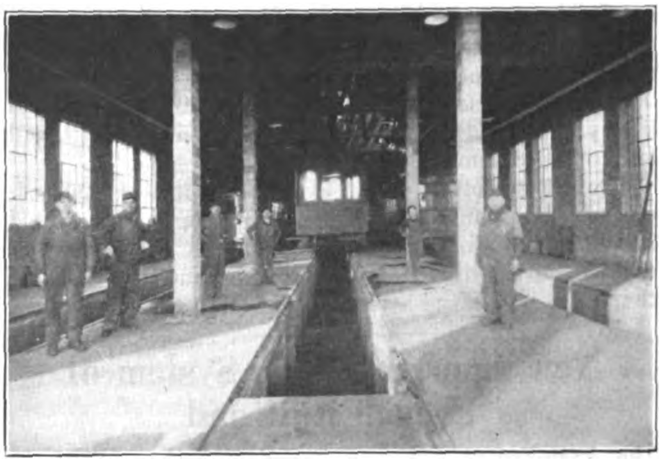
The measure of success gained by the officials in securing attendance at these meetings is given in the following table:

Total number of division meetings	293
Total attendance at division meetings	4,184
Average attendance per meeting	14.3
Total attendance by men who left company	283
Total attendance by men still with the company	3,901
Number of men who finished meetings and examination	512
Number of men who missed examination	139
Number of men who missed examination and one meeting	36
Number of men who missed examination and two meetings	73
Number of men who missed examination and three or more meetings	170
Average number of meetings attended by each man	4.2
Percentage attendance	76.5
Total number of auditorium meetings	10
Total attendance	3,540
Average attendance at each meeting	354
Total attendance by men who have left company	272
Total attendance by men still with company	3,268
Average number of meetings attended by each man	3.5
Percentage attendance	35

The final results of this instruction work are impossible of exact measurement, because other conditions than the instruction program in force at the same time helped to improve the service. The final measure of the results is of course the increase in revenue due to the increased efficiency of the men. Just prior to the time at which the instruction work was started, the total revenue from city lines was approximately $2,000 per day less than for the same period in 1919. During the early part of January, 1921, just after the completion of the instruction work, this difference had dropped to approximately $750 per day, or an increase in the general trend of revenue of approximately $1,250.

Part of this improvement is undoubtedly due to the operation of a greater number of cars, but it is also due in great measure to higher operating speeds and greater reliability of service, which are in turn at least partially attributable to the instruction work. The cost of the instruction campaign was not in excess of $5,500. At a conservative estimate that it resulted in an increase in revenue of only $200 per day, the cost was paid for in the course of less than one month's operation.





AT LEFT, FRONT OF NEW CARHOUSE IN MASSILLON, OHIO. AT RIGHT, CONCRETE FLOOR AND OPEN TYPE PITS FACILITATE INSPECTION WORK

New Car House in Massillon Occupied

Northern Ohio Traction & Light Company Moves Into New Brick Carhouse in Massillon, Replacing the Main Street House, Which Was Destroyed by Fire

THE old carhouse of the Northern Ohio Traction & Light Company on Main Street in Massillon was abandoned a short time ago when the occupancy of the new house, built just off the Canton-Massillon Road, was completed. The new carhouse, a brick building with stone trimmings, will care for twenty-two city cars, a snowplow and a work train. It contains a repair shop, with a supply building adjoining, where facilities are provided for making only the lighter car repairs. The main building is 63 ft. wide by 120 ft. long and two stories high.

On the first story open or intercommunicating type pits extending practically the full length of the building facilitate inspection, repairing and cleaning of cars. The tracks over these pits are supported on steel columns incased in concrete. The upper floor, supported by center columns of the same type, contains the dispatcher's office, a trainmen's club-room, separate lockers for the mechanics and trainmen and complete shower baths. The clubroom, containing comfortable chairs, pool tables, books and magazines, is an exceptionally attractive place.

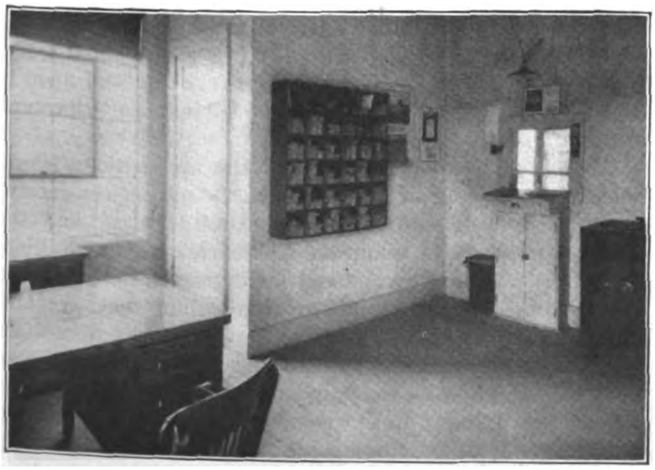
The floors of the building are concrete. It is heated with a vapor heating system.

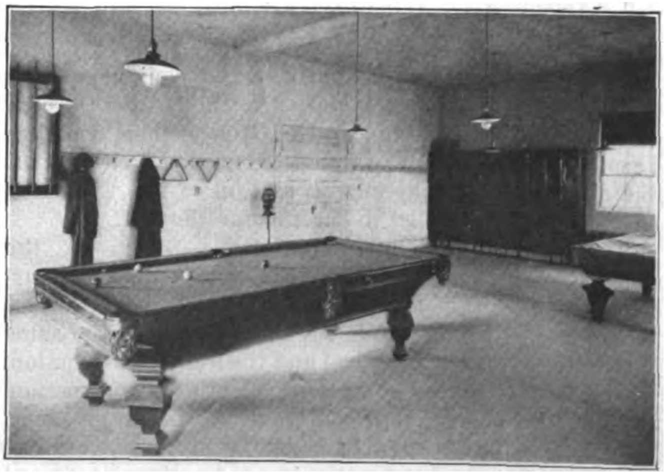
The carhouse which was damaged by fire some years ago will soon be completely wrecked. The property faces a frontage of 60 ft., with a depth of 420 ft. The new location was selected in order to release for sale this more valuable city property.

There are about 200 ft. of switches in and around the carhouse. As the demands for more trackage increase additions will be made to the yard in the rear of the building. One of the company's substations, itself an attractive building, is located on the same property only a short distance from the carhouse.

Work of F. A. E. S. Is Progressing

A RECENT statement by the executive secretary of the Federated American Engineering Societies, L. W. Wallace, says that permanent headquarters have been established at 719 Fifteenth Street, N. W., Washington, D. C., where there will be a conference room for those engineers who may desire to use the headquarters as a meeting place. Mr. Wallace will be permanently located at this office in the near future. The statement also mentioned recent activity in a number of states regarding the licensing of engineers. While the F. A. E. S. has not initiated any such legislation nor urged its passage, it has taken the position that it desires to be instrumental in securing the passage of bills that will





AT LEFT, A CORNER OF THE DISPATCHER'S OFFICE ON THE SECOND FLOOR. AT RIGHT, TRAINMEN'S CLUBROOM ON THE SECOND FLOOR, MASSILLON CARHOUSE not be detrimental to public interests and to the engineering profession. The field work of the committee on elimination of waste in industry, to which reference has already been made in this paper, will be completed by April 15, and it is expected that the final report will be published some time in June.

The next meeting of the executive board of the Federated American Engineering Societies is to be held in Philadelphia on April 16. The dinner in the evening will be addressed by President Hoover, and it is expected there will be a large attendance of engineers.

New Apprenticeship System of French Railroad

The Paris-Orleans System, Which Will Soon Have an Extensive Electrified Mileage, Has in Use a Comprehensive Plan for Training Mechanics

IN RECENT issues of the *Revue Générale des Chemins de Fer* and the *Génie Civil* some interesting detail is given of the apprenticeship system which is in use by the Paris-Orleans Railway. While this is a steam road, the principles which it has developed have wide application.

The courses of instruction are designed to give apprentices both practical and theoretical training. The students are admitted between the ages of fourteen and seventeen years on the basis of a simple examination, including medical inspection. On admission, apprentices sign a contract which is countersigned by the parents, under which they agree to remain until their military service begins. The breaking of the contract involves forfeiture of the right to a cash reward on completion of the course.

Each year about 400 students are admitted, and they remain to the end to a very satisfactory extent.

The fundamental principles followed in the course are these: (1) The apprentice is developed in the shop, where his work is followed as in a school. (2) He is paid enough to hold him, and he is given sufficient practical work partially to offset his wages and at the same time to interest him. (3) His theoretical instruction, for which about six hours per week are reserved, consists principally of showing why and how the work must be done in a particular way. It comprises courses in French, arithmetic, geometry, physics, mechanics, drawing and technology.

APPRENTICES ARE PLACED IN SPECIAL SHOPS

The apprentice is not placed alone in the midst of regular workmen, but is given special equipment in a separate but real shop. He learns his trade through productive work; making, in the Orleans shop, complete locomotive repairs, for example. Experience shows that the apprentices can become as skillful in this way as if they had been retained in the regular shops.

Unless it is absolutely impossible to do so, the apprentices are grouped in the shop under the surveillance of an instructor, who can effectively direct ten to twelve young men. As far as possible the same instructor gives the practical and theoretical instruction.

The railway gives two general varieties of instruction, that at the depot shops and that at the main shops. The first is designed principally to produce workmen capable of becoming traveling locomotive inspectors and locomotive repair foremen, while the other is to train specialists in the various branches of shop work.

In the courses one-half a day is devoted to theoretical work (six hours per week) and instructive shop exercises (eighteen hours per week), the remainder of the day being spent in routine work. In the first year the young men are occupied at the bench-vise, on machine tools, at the forge and in the boiler shop. In the second year they are grouped in special sections supervised by selected workmen, to whom they serve as assistants. In the third year they work under the direction of instructors but without special workmen.

The foundry and forge apprentices pass a year in one or the other of two special schools, where they follow a practical course and cover fundamentals of descriptive geometry, tracing of drawings, manual work of the foundry on one hand, or one on theoretical rules of the art of modern forging, rules of welding and actual forge work for the other.

The theoretical instruction in the general course covers three years, although the program is for two years only, the second year being taken up with review of the first-year courses.

A supervisor has oversight of the apprentices throughout courses, and competition is fostered by the giving of prizes for excellence in passing examinations. Graduates from the courses receive diplomas and leather-bound records of the results of their examinations.

The young men are paid at the start from 1¼ to 1¾ francs per day, according to age, and the compensation is increased gradually until they reach as much as or even more than the regular workmen are paid, as their skill and capacity increase.

THE "SECOND DEGREE" COURSE

Young men who in their first year are deemed to be capable of profiting by a higher type of instruction than that given the apprentices are admitted to a three-year complementary course. About one-thirtieth of the new men, or 7 to 8 per cent of the total number of apprentices are admitted to this course each year. This course is covered by a special contract. It covers more advanced principles of mathematics, the elements of mechanics and physics sufficient for the understanding of the operation of the machines and the purposes underlying shop operation, a course in steam machinery and in the repair of the complete equipment, and is topped off by a course in industrial design, some fundamentals of electricity, chemistry and political economy. These courses are conducted by correspondence with experts at the company headquarters at Orleans. An examination is held each month.

The "second degree" apprentices are counted upon to assure a supply of recruits for positions as inspectors, foremen, underdepot chiefs, etc.

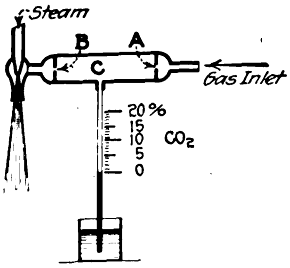
As to the financial results of the apprentice system, these are difficult to demonstrate. Apprentices receive annually a total of about 3,500,000 francs, and the general expense is about 100,000 francs. In addition, machines which are repaired by apprentices are out of commission somewhat longer than when they are prepared in the regular way. The first year the apprentices undoubtedly cost more than they return, but the reverse is true during the second and third years. On the whole the 1,200 apprentices appear approximately to produce enough to compensate for the cost of operating the plan. In addition there is the improvement in recruiting facilities and in the development of better characteristics in the personnel.

Improved CO_2 Recording Equipment

Added and Improved Features Make CO_2 Recorder More Valuable for Preventing Inefficient Boiler Operation—Remarkably Quick Action, Greater Accessibility and Simplicity of Parts Among Advantages

THE Uehling Instrument Company has introduced a new model CO_2 recording equipment, known as style "U," which embodies important improvements over the superseded model. Chief among its advantages are remarkably quick action, greater accessibility and simplicity of parts and the economy of combining in one machine means for determining CO_2 simultaneously from any number of boilers up to six.

A single-unit Uehling CO_2 equipment for one boiler consists of three principal parts, namely, a CO_2 meter proper, a recorder and an auxiliary boiler front indicator. The function of the meter, which is placed wherever most convenient, is to actuate the boiler front indicator and the recorder in the engineer's office.



THE CHAMBER OF THE CO_2 METER, ILLUSTRATING THE PRINCIPLE INVOLVED IN ITS OPERATION

The flue gas is analyzed—that is, the CO_2 is extracted—in the meter. The principle involved in the operation of this machine depends upon the change in pressure caused by a change in volume in a stream of gas flowing through two apertures. Referring to the diagram, gas is drawn continuously by the action of an aspirator through aperture *A* into the chamber *C* and out through aperture *B*. A reduction of the gas volume between the two apertures caused by the absorption of the CO_2 content causes a change of pressure or tension in chamber *C*, which is transmitted to the recorder and indicator calibrated in per cent CO_2.

The CO_2 meter consists essentially of a cylindrical regulator on which is mounted the analyzing mechanism. This regulator maintains constant the suction created by the aspirator, thereby eliminating all changes in pressure between the two apertures except those caused by absorption within the chamber. It is the latter changes in pressure which the indicator and recorder register.

Suction in the chamber actuates the recorder and indicator continuously and almost instantaneously. The only appreciable lag was formerly in the travel of the gas from the boiler to the instrument. In the new model the gas travel is hastened by utilizing the main aspirator's exhaust in an auxiliary aspirator to draw the gas from the boiler up to the absorption chamber, while the main aspirator simply draws the gas sample through the absorption chamber. The preliminary filter, which removes soot and dirt from the sample before it reaches the intermediate and final filters on the machine, has been redesigned so that the filter chamber can be conveniently cleaned without interrupting the operation of the apparatus. This method of flue gas analysis employs no chemicals, but substitutes for them a convenient dry absorbent carton, readily removed and replaced.

Multiple equipments combine in a single outfit means for measuring the percentage of CO_2 from one up to six boilers independently. This apparatus is designed on the unit plan and may be added to from time to time. For instance, a plant having initially an equipment of less than six units can easily have attached additional units, until the total is six, as new boilers are installed.

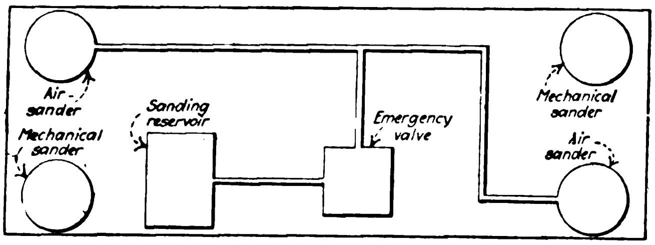
Mechanical Sanders for Safety Cars

Two Air Sanders Used on Safety Cars of Trenton & Mercer County Traction Company Being Replaced with Mechanical Sanders in Interest of Safety and Economy

BY HERBERT E. KROUSE
Master Mechanic Trenton & Mercer County Traction Company, Trenton, N. J.

ON THE sixty Birney safety cars which the Trenton & Mercer County Traction Company is operating the sanding equipment originally consisted of four sand hoppers with air sanders, all of which were in operation whenever an emergency application of the brakes took place. This caused an exceptionally large amount of sand to be used, which the company's officials felt could be somewhat reduced. Results of trials made in Trenton have shown that, while the air sanding feature which is incorporated in the M-28 brake valve has many good points, still a mechanical sander which will operate with a slight continuous foot pressure seems preferable.

The excessive amount of sand used with air-operated sanders, the labor necessary for drying the sand and filling the sand boxes, the added duty put on the air compressor, the lack of sand where the air fails and the rather high maintenance of the brake valve which is used to operate the air sander combined to make it desirable to change this part of the equipment. The accompanying diagram shows the arrangement which is now being used. One air sander on each end of the car has been removed and foot-operated mechanical sanders, manufactured by the Nichols-Lintern Company, have been substituted. In regular service this would give but one sand box delivering sand to the rail instead of two.



ARRANGEMENT OF SANDING EQUIPMENT FOR SAFETY CARS

The two remaining air sanders are disconnected from the brake valve, but still retain their connection with the emergency valve. This assures the delivery of sand to the rail during an emergency application from either the brake valve or the controller handle, and insures that but two sanders are working instead of four. The hinged air lever is no longer a necessity and this change should materially increase the life of the lever and reduce the maintenance cost.

From results so far obtained, we believe that by carrying out this change we shall be able to effect a very large saving over our present cost for maintaining the sanding equipment on our safety cars and in all other items bearing a relation to this one there will be a corresponding saving.

Boiler Inspectors Meet in Detroit

THE first annual meeting of the National Board of Boiler and Pressure Vessel Inspectors brought together at the Hotel Statler in Detroit recently a group of about sixty men, including members of the board itself, members of the boiler code committee of the American Society of Mechanical Engineers and other interested persons.

The first day was devoted to addresses. Dr. D. S. Jacobus, acting chairman of the boiler code committee, told of the development of the code, emphasizing the fact that no action had been taken without consideration of the interests of all involved in the questions under discussion. Charles E. Gordon, chairman of the American Uniform Boiler Law Society, told how the first boiler code committee came to be appointed by Colonel E. B. Meier, then president of the A. S. M. E.; how the society had reached the limit of its functions in the formulation and interpretation of the code; how the Uniform Boiler Law Society had been organized to promulgate the code, and how the National Board of Boiler and Pressure Vessel Inspectors had been organized at the instigation of the American Uniform Boiler Law Society.

Some of the other speakers were E. R. Fish, vice-president Heine Safety Boiler Company; F. R. Low, editor of *Power*, and J. G. McCabe, commissioner of the city of Detroit and chief inspector of boilers for the State of Michigan.

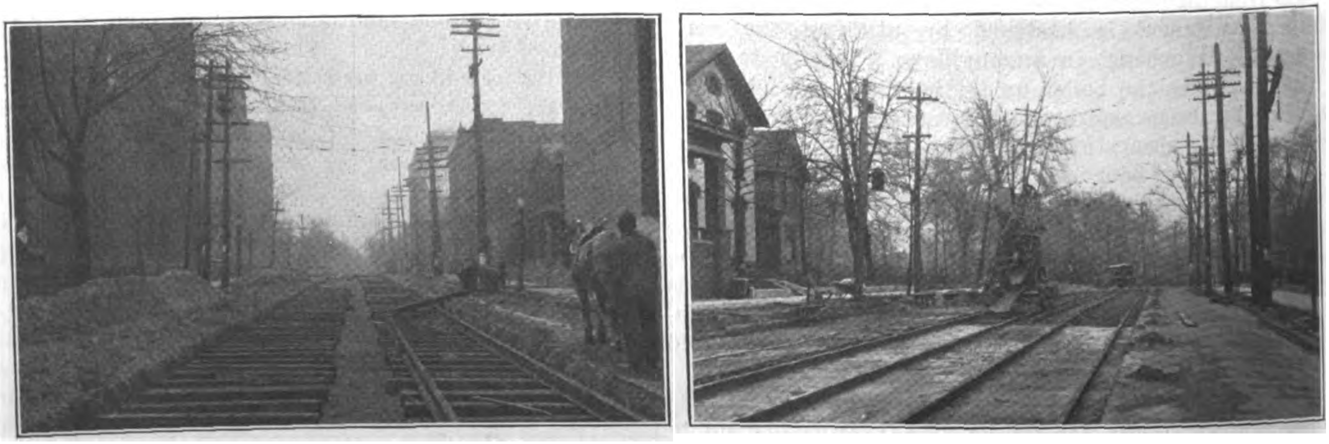
On the second day the members of the board took part in the deliberations of the boiler code committee, the meeting of which was held at Detroit in order to give the committee the advantage of conference with men from all over the country who are enforcing the code. Joseph F. Scott, inspector from New Jersey, is to continue as chairman of the National Board, and C. O. Myers of Ohio as secretary-treasurer. The objects of the Board of Boiler and Pressure Vessel Inspectors as stated in the constitution adopted are as follows: To promote uniform boiler laws; to secure uniform approval of specific designs of boilers and other pressure vessels, as well as appurtenances and devices used in connection with their safe operation; to promote one uniform code of rules, one standard stamp to be placed upon all boilers constructed in accordance with the requirements of that code, and one standard of qualification and examination for inspectors who are to enforce the requirements of said code, and to compile official statistics.

FOUNDATION READY FOR THE LAYING OF THE TRACKS

Track Construction During Severe Weather

ACCOMPANYING photographs show different stages of the work of double tracking a line in Fort Wayne, Ind., by the Indiana Service Corporation. This work was done on Clinton Street, between Main and Lewis Streets, a distance of five blocks. The work was completed in a little less than a month's time at a cost of approximately $50,000. During the construction the temperature of the weather was below freezing for a considerable part of the time and in one of the accompanying illustrations the substructure may be seen covered with manure to keep the new construction from freezing.

Previous to the double tracking of this line there was a single track on this street, but the congestion of traffic on Calhoun Street, which is one block west of Clinton Street, and is the main traffic street of the city, was so great that some change was imperative. It was accordingly decided to double track the line through Clinton Street and run the cars both ways on this street instead of into the city as was done previously. The city authorities insisted that the Indiana Service Corporation complete the work within one month, and the work was done in this time by working both day and night shifts.



AT LEFT, TIES IN PLACE AND TRACK CONSTRUCTION STARTED. SUB-BASE COVERED WITH MANURE TO PREVENT FREEZING. AT RIGHT, TRACKS IN PLACE AND CONCRETE BEING POURED

Letters to the Editors

Accident Reduction Versus Excessive Concentration Upon Fare Collection

NEW YORK CITY, March 25, 1921.

To the Editors:

A recent analysis of damage and injury claims and suits against street railways showed that the primary cause of one class of accidents is that more attention is devoted by the conductor to the collection of fares than to the safety, comfort and convenience of his passengers.

It is all very well to endeavor to impress the car operatives with the importance of "safety first," but the relation of fare collection to this must not be overlooked. While the now almost universally used "closed step and door," especially of the type used in the one-man car, have, if properly used, a great tendency to lessen "step accidents," they introduce danger of accident if carelessly operated. This is due to the fact that there have been laid on the car operatives, especially on the conductors or fare-takers, other duties which engage their attention to the exclusion of care which should be exercised for the safety, comfort and convenience of the passengers.

The "prompt and accurate" collection of fares is made a fetich by many street railway companies, although modern fare-collection practice renders it no longer necessary for the conductor to concentrate his whole attention on that one point.

On one property investigated, not 10 per cent of the conductors paid more than perfunctory attention to the opening and closing of the steps and door. A complete analysis of the situation on this road and on others plainly proved that the trifling saving in fares effected by the strict attention required of the conductor in completely collecting them was but a small fraction of the resulting cost of the accidents, the unfortunate effect of the "near accidents" and the accompanying irritating incidents. While "safety first" was well propagated among the carmen, there was lacking the incentive that existed with reference to the collection of fares. The fare-taker was held personally accountable for proved failure to collect the full amount and number of fares and consequently manifested a strong interest in this portion of his duties.

This matter was brought strongly to the attention of the writer many years ago when he was operating a street railway on which there was not only the usual rush traffic at morning, noon and night, but which had, during the summer season, tremendous rush traffic during whole days due to excursionists and other pleasure seekers. This was complicated, at that time, by the use of open cars and by the fact that the conductor personally collected fares by passing through the car or on the side-board of the open cars. After analysis of the situation the stress on the carmen regarding fare collection was reduced and more emphasis was laid upon accident prevention, with a full explanation to the carmen as to the reasons therefor. The results were carefully watched and, as far as possible, tabulated. The first results were not especially encouraging as regards fare collection, but the results as to the lessening of accidents were so good that the proof of the efficiency of the change was noticeable. After the elimination of the carmen who dishonestly took advantage of the concession, the number of accidents was permanently reduced more than two-thirds.

This matter is certainly worth the consideration of many street railway managers, as it is found that few of them have properly considered this aspect of the case.

"MANAGER."

"Present Value" in the Galveston Case

CHICAGO, April 1, 1921.

To the Editors:

In your issue of March 19, page 571, there is a summary of a court decision entitled "Present Value Theory Rejected." The title is misleading, for the court sustained the present value theory, and actually added 33⅓ per cent to the original cost to get the prospective reproduction cost, from which accrued depreciation was deducted.

H. P. GILLETTE.

[EDITOR'S NOTE.—The thought back of the caption written was that the special master's proposed plan of recognizing present value in the Galveston case was rejected. Mr. Gillette is correct, however, in his statement that the court did not reject, but rather followed, the present value theory as the correct basis, as described in the article, although the court took a somewhat novel method of arriving at the figure to use.]

Car Development in Boston

IN THE March, 1921, issue of *Stone & Webster Journal* appears an interesting account of the development of the urban transportation system in and around Boston, Mass., from the time that coaches and omnibuses were first operated. It seems that the first omnibus in Boston, the "Governor Brooks," started running in 1833, over a route from the Winnisimmet Ferry at the foot of Hanover Street to Roxbury. The fare was 12½ cents and it took an hour and a quarter to make the trip. The bus was drawn by four horses and had seats for eighteen passengers outside and six inside, making a total of twenty-four.

The first horse railway in Massachusetts is said to have been from Harvard College, Cambridge, to Union Square, Somerville, about 1½ miles. The equipment was a dilapidated steam railroad coach, to which a pair of horses was hitched. There is a wide disagreement as to the date of the brief career of this horse railway. In 1852 the first charter was granted to a horse railroad. This was to what was known at that time as the Dorchester & Roxbury Railroad. The first horse-drawn street car was run over Boston streets on March 26, 1856. Electric cars were first operated on Feb. 16, 1889.

The original horse cars were 16 ft. long, with a seating capacity of twenty. The first cars with electric equipment seated thirty-four passengers and cost $3,500. In 1905 the semi-convertible car was introduced. This was 48 ft. 2.5 in. over all and had seats for fifty-two passengers and cost from $10,000 to $12,000. In 1917 the center-entrance, 6,000 type car was first put on the streets. This car is 48 ft. 2.5 in. over all, seats fifty-eight and cost $15,000. The Cambridge subway cars are 69 ft. 2.5 in. over all, seat seventy-two and cost $24,000 each.

Association News

Audit Nearing Completion

PRESIDENT GADSDEN was in New York last week. In speaking of the association affairs, he said that the financial audit, which is being made under the direction of M. R. Boylan, Public Service Railway, is nearing completion. The check-up indicates that the loss due to misappropriation of funds will exceed the amount originally given out. At the present time this is estimated at from $60,000 to $70,000.

No definite action has been taken on the selection of a permanent secretary. One suggestion, made by several members of the association representing large interests, is that the position of secretary be not filled immediately. Several names for the position of secretary have been mentioned.

The next meeting of the executive committee will be held on April 15.

Convention Committees

TWO additional committees, one on convention location and one on exhibits, have recently been appointed to assist in perfecting plans for the 1921 convention.

The personnel of the committee on location consists of J. G. Barry, General Electric Company, New York, chairman; D. B. Dean, Kuhlman Car Company, Cleveland, Ohio; F. C. J. Dell, National Railway Appliance Company, New York; H. B. Flowers, United Railways & Electric Company, Baltimore, Md.; F. H. Gale, General Electric Company, Schenectady, N. Y.; B. A. Hegeman, Jr., National Railway Appliance Company, New York; C. L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; J. B. Kilburn, Hale & Kilburn, New York; W. H. Sawyer, East St. Louis & Suburban Railway, East St. Louis, Ill.; J. N. Shannahan, Newport News & Hampton Railway Gas & Electric Company, Hampton, Va.; H. D. Shute, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., and J. J. Stanley, Cleveland Railway, Cleveland, Ohio.

The committee on exhibits is made up as follows: J. C. McQuiston, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., chairman; F. C. J. Dell, National Railway Appliance Co., New York; F. H. Gale, General Electric Company, Schenectady, N. Y.; S. D. Hutchins, Westinghouse Traction Brake Company, Columbus, Ohio; E. B. Meissner, St. Louis Car Company; W. J. Pine, Railway Utility Company, Chicago, Ill.; E. C. Price, Indianapolis Switch & Frog Company, Cleveland, Ohio; A. M. Robinson, J. G. Brill Company, Philadelphia, Pa.; W. L. Schaeffer, National Tube Company, Pittsburgh, Pa., and L. W. Shugg, General Electric Company, Schenectady, N. Y.

The exhibit committee has sent to manufacturer members through acting Secretary Welsh four questions concerning the holding of an exhibit at the 1921 convention. It is hoped to determine in advance if possible the attitude of the manufacturers on this matter due to present depressed business conditions and the unsatisfactory proposition offered by the pier representatives at Atlantic City. The questions are based on a charge for exhibit space of 60 cents per square foot, the same as last year. Each member is requested to say if he favors holding an exhibit at Atlantic City, whether or not he will exhibit, and approximately how much space he will use. Answers are requested by April 12 due to the fact that the matter must be definitely decided at the coming executive committee meeting, to be held on April 15.

Delegates to Annual Meeting of Chamber of Commerce

ACTING SECRETARY. J. W. WELSH of the American Association has just announced the names of the national councillor and alternate and the delegates and alternates for the annual convention of the Chamber of Commerce of the United States, to be held in Washington, D. C., April 27 to 29. The list follows:

National councillor, Lucius S. Storrs, president the Connecticut Company, New Haven, Conn.; alternate, J. H. Hanna, vice-president Capital Traction Company, Washington, D. C. Delegates, J. P. Barnes, president Louisville (Ky.) Railway; W. A. Draper, vice-president Cincinnati (Ohio) Traction Company; P. H. Gadsden, vice-president United Gas Improvement Company, Philadelphia, Pa.; John H. Pardee, president J. G. White Management Corporation, New York, N. Y.; W. H. Sawyer, vice-president E. W. Clark & Company Management Corporation, Columbus, Ohio; Thomas S. Wheelwright, president Virginia Railway & Power Company, Richmond, Va. Alternate delegates, H. W. Blake, editor ELECTRIC RAILWAY JOURNAL, New York, N. Y.; F. R. Coates, president Toledo Railways & Light Company, Toledo, Ohio; D. B. Dean, manager Kuhlman plant the J. G. Brill Company, Cleveland, Ohio; M. B. Lambert, manager railway department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; Charles C. Peirce, manager railway department, General Electric Company, Boston, Mass.

Way Committee Meets

A MEETING of the Engineering Association committee on way matters was held at association headquarters on April 6. All day and evening was spent in technical discussion of standardization of special trackwork, joint welding and allied topics. The results of a large amount of detail work by sub-committees were presented and it was evident that real progress has been made in the difficult work of standardizing frogs, crossovers, turnouts, etc. Some recommendations as to standards were adopted and a tentative program was laid out for the next meeting, to be held May 18, with provision for necessary sub-committee meetings in the meantime. The committeemen present were: R. C. Cram, Brooklyn Rapid Transit Company, chairman; H. A. Abell, New York State Railways, Rochester; Victor Angerer, Wm. Wharton, Jr., & Company, Easton, Pa.; S. Clay Baker, East St. Louis & Suburban Railway, East St. Louis, Ill.; W. R. Dunham, Jr., the Connecticut Company, New Haven; E. B. Entwisle, the Lorain Steel Company, Johnstown, Pa.; Howard H. George, Public Service Railway, Newark, N. J.; E. M. T. Ryder, Third Avenue Railway, New York, N. Y., and James Budd and F. A. Weymouth, representing C. A. Alden, Bethlehem Steel Company, Steelton, Pa., who was kept away by illness. A telegram of sympathy was sent Mr. Alden by the committee. S. W. Dannatt, Rail Welding & Bonding Company, New York, N. Y., was also present by invitation.

Co-operation and Responsibility

THE following letter was written by H. M. Atkinson, chairman of the board of directors of the Georgia Railway & Power Company, Atlanta, Georgia, to W. D. Mahon, president of the Amalgamated Association of Street and Electric Railway Employees of America, subsequent to the appearance of Mr. Mahon's article in the Feb. 12 issue of the ELECTRIC RAILWAY JOURNAL.

Mr. Mahon has written to Mr. Atkinson that he will answer his letter in the near future. Meanwhile this original letter is printed in the ELECTRIC RAILWAY JOURNAL with the consent of Mr. Atkinson and Mr. Mahon. The letter follows:

GEORGIA RAILWAY & POWER COMPANY
OFFICE OF THE CHAIRMAN
ATLANTA, Feb. 24, 1921.

MY DEAR MR. MAHON: Your article on the street railway problem which appears in the Feb. 12 issue of the ELECTRIC RAILWAY JOURNAL is very interesting. Your statement appeals to me because I am especially interested in the problem, and also because you state the points clearly and simply. In the main I agree with everything you say.

There is one phase of the service-at-cost plan that you do not deal with. This particular phase is the one that has given me most trouble in trying to bring myself to accept the plan. To put it briefly, the question I wish to ask is, how are you going to prevent expenditures, and therefore rates, from spiraling upward in "vicious circles"? It seems to me that this problem must be solved in each case where the plan is adopted. I have general ideas of my own how this could be accomplished, but I am very anxious to have your views. Personally, I doubt whether a supervisory commission or commissioner will solve this question satisfactorily.

In some way the incentive to efficiency must be retained. If all hope of gain, or perhaps a better way to put it is reward, from efficiency is removed, capital cannot be obtained, nor will men of proper skill and ability be obtainable. No matter what our beliefs or theories may be, if the incentive of gain or reward is removed business will die.

The problem the Federal Labor Board is struggling with in Chicago at the present moment is, in a nutshell, nothing but what I have tried to state above. The labor organizations tell the roads if they are losing money to go to the Interstate Commerce Commission and get higher rates. But the rates already are all the "traffic will bear." No matter how much we may protest against it, there is no avoiding the economic law that wages as well as rates must and will come down or go up relatively to the decrease or increase in the purchasing power of the dollar. The value of the services of every individual worker, including you and me, is subject to that law.

Why isn't the present Cummins-Esch law in its general application a service-at-cost plan?

Referring to your idea of co-operation between the public (consumers), the owners and the operators, I agree with you thoroughly. But it has not been worked out practically, so far as my observation goes. If organized labor can be induced to assume completely its just share of responsibility for production to the extent of guaranteeing it with responsibility, I imagine that nearly all the opposition to the "closed shop" on the part of employers will disappear. It is my opinion that the weakness of organized labor is that it does not come out frankly and accept this responsibility. It cannot be avoided in the end, and the fact that it does not accept such responsibility is the source of nearly all the trouble. What I mean is that if organized labor seeks partnership it must assume the responsibility of a partner. It must accept the unavoidable fact that the only source for the payment of wages is production.

I have been hoping for a long time to see you again. I would like to discuss this subject and others with you.

H. M. ATKINSON,
Chairman of the Board.

Controversies Over Car Insurance Eliminated

A NEW form of insurance policy covering rolling stock has this year been negotiated with the insurance companies by T. A. Ferneding, vice-president and general manager Dayton, Springfield & Xenia Railway, Dayton, Ohio. The usual form of policy covers all cars at 100 per cent of their combined value and is known as a blanket policy. In case of loss by fire, when the company has a policy of this kind, there are two positions the insurance companies may take which tend to defer settlement.

If the insurance company establishes on investigation that the insurance carried on all cars was less than 100 per cent of their value, the railway company becomes a "co-insurer" to the extent of the percentage of total value not covered. On the other hand, if the insurance company takes the position that the cars are overinsured, and therefore refuses to pay the full loss on that basis, then the railway company is in the position of having paid premiums on the excess insurance to no avail.

In the new form of policy each car is listed by number with a stipulated value determined by two people and agreed upon in advance by the railway company and the insurance company. This list of car numbers and corresponding values is attached to the policy and made a part thereof. If the value of a particular car is established at $15,000 it is insured at $15,000, and in case of loss the railway company simply makes claim for the loss of certain cars listed by number, and their value is a fixed amount upon which there can be no controversy. The values placed upon the cars are adjusted each year to provide for changing market conditions and deterioration of equipment. Mr. Ferneding thinks that this arrangement will eliminate a lot of unpleasant negotiation and properly insure the railway company against loss or excess premiums.

Congress has increased the annual appropriation for the United States Forest Products Laboratory, located at Madison, Wis., by the sum of $100,000. This will enable the laboratory to extend its researches in the field of wood preservation, etc., many of which are of great value to the electric railway industry. Carlile P. Winslow, director of the laboratory, has issued an expression of appreciation of the active indorsement of the laboratory by its many friends.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Toledo Problems Pressing

Rerouting, Wages and Power All Claim Attention Under Service-at-Cost —Will Check Costs

Toledo has a great deal to think about as a result of the submission of a rerouting plan, suggested wage reductions by the Community Traction Company, and negotiations looking toward the establishment of a proper power rate for the traction company.

FOUR PLANS FOR REROUTING

At a meeting of the board of control Commissioner Wilfred E. Cann presented four suggestions for rerouting which were approved and handed over to the Council for action. One of these would result in the rescinding of a 12-mile speed law and permit speeding up of all cars so as to obtain a 9-mile an hour average rather than 8 as now.

The wage contracts of platform employees and electrical workers expired at midnight on March 31 and at that time no agreement had been reached. It was agreed, however, to maintain the status quo until April 8.

The present wage scale for platform men is 60 cents for those who have been with the company for six months, 56 cents for those in employ three months, and 54 cents for those beginning. The scale suggested by the company and turned down by the men provided for a cut of 2 cents an hour for the old employees and rates of 54 and 50 cents an hour for the other classes. The cost of living in Toledo was shown to have dropped 15 per cent since the 1920 contract was drawn.

It has developed that the Community Traction Company took up as an obligation with the railway property approximately $50,000 of last year's taxes on the railway. Commissioner Cann and the board are attempting to spread this amount over a long period so that operating costs will not be loaded too heavily the first few months. The company also took to itself paving obligations of $185,000 and it is the feeling of the board that this item should be placed in capital account in some way.

POWER ENGINEERS CONFER

The power matter was taken up at a conference attended by Law Director Martin; Commissioner Cann; B. V. Phillips, consulting engineer, Cleveland; Henry Riggs, valuation engineer, Ann Arbor; David Friday, accountant, Ann Arbor; members of the street railway board, Frank Coates, president of the traction company, and Ferd Derge, assistant general manager of the Toledo Railways & Light Company.

The Acme Power Company plant, a Doherty enterprise, not a public utility, supplies 90 per cent of the traction power. If Henry L. Doherty will give permission David Friday and B. V. Phillips will check the costs right back to the coal pile. Then negotiations for a fair rate will begin with arbitration as the final step in the event of failure to agree.

Taxpayer Attacks Cincinnati Service at Cost

Forfeiture by the Cincinnati (Ohio) Traction Company of its fifty-year franchise, granted by the Rogers law in 1896, was demanded by Attorney Albert S. Alcorn in a taxpayer's suit filed in Common Pleas Court on March 29. The Cincinnati Street Railway, from which the Traction Company leases its lines and rights, also is made a defendant. The suit charges that the Traction Company has violated its franchise in that more than 5 cents is charged for a ride in violation of the provisions of the Rogers law. Attorney Alcorn, explaining this provision, said that he believed the revision ordinance, known as the service-at-cost plan, was unconstitutional. The Rogers law, he explained, provides for a decrease in fare only.

The plea asserts also that the companies have decreased the percentage tax on gross earnings which they were required by the terms of the fifty-year franchise to pay to the city. Refusal to pay car license fees required by the Rogers law also is charged in the suit.

Other charges in the suit against the companies are that they have sold steel rails and other commodities to individuals and corporations, thus defrauding the city out of $400,000.

Attorney Alcorn says that on Feb. 17 he requested City Solicitor Saul Zielonka to file suit. This he supplemented with additional reasons to the solicitor on Feb. 21 and March 7, but Mr. Zielonka has refused to bring action so he filed it himself as a taxpayer. Mr. Alcorn declares that the Cincinnati Traction Company is an Ohio corporation organized "for the purpose of furnishing a corporate name in which to lease from the Cincinnati Street Railway its lines of street railway in the City of Cincinnati, under what is known as the Rogers fifty-year franchise law."

Elsewhere in this issue reference is made to the resignation of C. P. Taft as first vice-president and director of the Ohio Traction Company and to the withdrawal of W. C. Culkins as City Street Railway Director to become executive secretary of Cincinnati Chamber of Commerce.

Another Solution Offered

Representatives of City of New Orleans Advance New Plan with $35,000,000 Valuation Figure

A rift has finally been made in the clouds of uncertainty that have hovered over the prospective settlement of the troubles of the New Orleans Railway & Light Company. At a meeting on March 30 of the Mayor, the Commissioners of the Commission Council and the members of the citizens' advisory committee a tentative plan was submitted by the representatives of the city looking to possible solution of existing entanglements.

Under the plan it is proposed that:

1. A valuation of $35,000,000 be placed on the entire property of the New Orleans Railway & Light Company, divided as follows:

New Orleans railway proper	$20,000,000
Electric light and power plant	8,000,000
Gas plant	7,000,000
Total	$35,000,000

Upon this valuation it is estimated by the Mayor and the Commission Council that the returns must be $2,150,000, allowing 7 per cent upon $5,000,000 of new money which it is estimated will be needed for rehabilitation.

REDUCED FARES SUGGESTED

2. The rate of fare after April 21, 1921, when the 8-cent fare expires by limitation, must not exceed 7½ cents; with reductions every six months thereafter of one-half cent until a "normal" level is reached.

3. The rates for gas and electricity must be cut proportionately and recommendations made for the acquisition of the gas plant at the valuation of $7,000,000.

4. Allowances must be made for proper reserves for replacements.

5. No distribution of undivided profits of the company shall be permitted without approval of the Commission Council.

6. No future issues of securities shall be permitted without the consent and approval of the Commission Council.

In anticipation of the probable purchase of the gas plant an ordinance is now being prepared by the City Attorney for submission to the Constitutional Convention, giving the city permission to issue bonds against any public utility.

Reports dissenting from the conclusions reached by the general committee have been filed with Judge Foster, of the federal court, by Walter B. Spencer, Leigh Carroll and Robley D. Stearns.

More Wage Cuts Proposed

Employees of Rochester, Syracuse and Utica Lines Solicited to Accept 1918 Rates

Proposals have been made by the New York State Railways for wage cuts of as much as 25 per cent on May 1 among trainmen employed on the lines of the company in Rochester, Syracuse, Utica and other cities. The proposed cuts are: City lines, from 60 cents an hour to 45; interurban, 62 to 47; third rail, 65½ to 50½.

In his letter to the men through Chairman Noon, President Hamilton of the New York State Railways says:

> After a most careful consideration of all interests involved the public, the employees and the company, and inasmuch as all authentic statistics show that the cost of living today has reached a point below where it was in July, 1919, and the general tendency indicates a further reduction in the price of clothing, foodstuffs and other commodities which go to make up living expenses, we feel that the wages as fixed by the National War Labor Board for motormen and conductors under date of July 31, 1918, would be fair to all parties interested under this contract.
>
> The working conditions under the present contract are an accumulation of years and have become so cumbersome and burdensome that it is impossible for the company working under them to furnish the best service to the public, and for that reason it has decided upon the changes set forth in the revised agreement submitted herewith.
>
> This company has increased the rate of wages to its employees 126.41 per cent over that paid at the beginning of the world war, while the increase in gross revenue has been only 37.65 per cent. On account of this condition the company was obliged to forego the payment of a return to its stockholders, never having previously paid a fair return to the people whose money is invested in this property.
>
> This condition cannot continue, not alone from the fact of the non-payment of dividends, but that the credit of the company must be restored and maintained at any cost if it is to meet the capital expenditures necessary to perform its first and principal duty, viz: Service to the communities through which it operates.
>
> I feel that in view of the importance of this subject a meeting of the representatives of the employees and the officials of the company should be held at the earliest possible moment, and would suggest April 4, 1921, in my office at Rochester, if convenient to the officers of the Amalgamated Association, at which time the whole matter can be discussed.
>
> I want the employees to feel that the company will exercise the same spirit of fairness that has been displayed in the past, and after a full and frank discussion of the whole matter we believe an adjustment can be reached which will be fair to the employees, to the public and to the company.

President Hamilton's letter does not specify the working conditions which have become "so burdensome and cumbersome."

These are the roads whose employees are asked to go back to where they were prior to May 1 of last year and accept practically the wage scales put in effect by decision of the war labor board in 1918:

New York State Railways, Syracuse, Rochester, Utica and connecting lines owned by the same company.

Rochester & Syracuse Railroad, connecting the two cities and serving communities between.

Auburn & Syracuse Electric Railroad, connecting the two cities and also covering the local lines in the city of Auburn and to Owasco lake.

Empire State Railroad Corporation, connecting Syracuse with Oswego, and including the Oswego city lines, and the Auburn & Northern, an 8-mile route connecting with the Rochester & Syracuse at Port Byron and with the Auburn & Syracuse at Auburn.

The Syracuse Northern (the South Bay road).

Prospects appeared to be bright for the settlement of the wage matter in conference after the first meeting on April 4. Definite findings, however, are not expected to be reached for a week. Meanwhile little information is expected to be available to the public. Mr. Hamilton is quoted to the effect that if an agreement can not be reached in conference then points in dispute will be arbitrated. The matter must of course be submitted to the men for final vote.

Schenectady Company Would Cut Wages

The new wage scale proposed by the Schenectady (N. Y.) Railway makes a reduction of 25 per cent from the present scale of 60 cents an hour. The new rate, which is to go in effect on May 1, is the same as the men were receiving a year ago.

The company was able to grant an increase about a year ago when the Common Council waived franchise rights temporarily allowing the company to petition the Public Service Commission for an increase from 6 to 7 cents in local fares and other increases on interurban lines.

There is an arbitration clause in the present agreement. Under the provisions of the contract the company had to present the draft of the new agreement thirty days before the old agreement expired.

Indiana Line Unable to Make Improvements

The railroad committee of the City Council of Evansville, Ind., has reported to the Council that Frank J. Haas, vice-president and general manager of the Southern Indiana Gas & Electric Light Company, has refused to extend the Howell line as requested by the committee. Mr. Haas said that the proposed extension would cost the company $30,000 or more and that the company could not afford at this time to make the improvement.

The company has also notified the Board of Public Works of Evansville that it will not make street improvements as requested by the board. Mr. Haas contends that the improvement of the portion of the streets between the rails does not benefit the railway and that the property owners along the street should pay for it. Mayor Bosse would "throw the tracks off the street and put in a bus line." The Mayor is said to have announced that he had received a letter from Glenn Van Auken, of the Public Service Commission, in which he advised that the City Council pass an ordinance demanding the company meet certain requirements of service.

Railway Versus Motor Bus

Canadian Commission Hears Experts on Relative Reliability for Use Between Toronto and Hamilton

James E. Richards, manager of the London & Port Stanley Railway, in giving evidence before the Ontario (Sutherland) Hydro-Radial Commission at Toronto the last week in March, as to the practicability of the proposed high-speed line between Hamilton and Toronto, submitted the following figures showing the growth of traffic:

Year	Number of Passengers	Amount of Freight
1917	726,799	$147,826
1918	842,641	143,608
1919	958,587	188,187
1920	1,002,034	210,239

At the time of electrification of the line it was estimated that the business could be done with four motor cars and five trailers; the railway was now using seven motor cars and ten trailers.

Mr. Richards stated that 97½ per cent of the business was competitive and could be handled by the Canadian Pacific, Grand Trunk, Michigan Central, Wabash and Pere Marquette steam roads, and in reply to a question stated that the business came to the electric railway because of service.

The total earnings now were $25,781 per mile, of which $11,017 were passenger receipts.

On the following days, March 30 and 31, Walter Jackson, consulting engineer, Mount Vernon, N. Y., testified. He stated that the cost of motor bus transportation was just about double that of electric cars operated over routes of reasonably dense traffic. For long-haul freight service the cost of common-carrier motor trucking was just about twice as much as many operators imagined. Even in the comparatively dense traffic district of New England there had been many failures. Mr. Jackson submitted figures showing that a 5-ton truck going 80 to 100 miles a day costs to operate about 60 cents per mile, or $60 a day, including the cost of warehouses, business solicitation, etc.

A motor bus company could not possibly carry passengers at the proposed hydro-radial rate of 2¼ cents per mile; it was an impossible rate no matter how much business was secured. Besides it could not possibly meet the schedule of a rapid transit line.

On Friday Charles A. Cheval, auditor of the International Railway, operating between Buffalo and Niagara Falls and other points, was a witness. The new 17-mile high-speed line between these cities cost $225,000 a mile, of which $180 000 was for right-of-way and structures, while power equipment and general cost amounted to $45,000 a mile. The new line enabled the company to cut thirty minutes off the time run, reducing it to one hour.

T. H. Stoffel, of the Westinghouse Company, stated that American express companies were doing away with motor trucks in smaller towns and replacing them with horse-drawn trucks.

Reports on Abandoned Lines

Massachusetts Utilities Department Not in Favor of State Ownership—Recommends Local Sudsidy

In reply to a set of questions relating to abandoned electric railway lines propounded to it by the State Legislature, the Massachusetts Department of Public Utilities has submitted a report the most striking feature of which is a firm stand in favor of "home rule" by local communities as regards the financial support or subsidy of weak lines and against a general policy of state ownership or aid, and secondly the abolition of the commutation tax and charges for highway maintenance.

370 MILES ABANDONED

The department considered it impossible to pass a properly considered specific judgment on the first question which asked for a determination as to what lines, whether now in operation or not, are necessary for the public welfare and convenience.

The report begins with a recapitulation of the discontinued lines in the Commonwealth. It shows that a total of seventeen electric railways have abandoned operation of 371.27 miles of track.

Referring to their abandoned lines the department states that some of them ought never to have been built, some ran to parks and other places no longer popular and some of them paralleled near-by railroad lines and were never a vital factor in transportation. The majority of the lines, however, were valuable arteries of travel and in many cases auto buses have been substituted for them. In the opinion of the department the value of these lines from the standpoint of the economic and social welfare of the public is a local question, best left for individual settlement to the communities most directly concerned.

The problem, however, involves not only the lines already abandoned, but the possibility that the future may see still further suspensions. This in the opinion of the department is the more serious part of the problem.

However, an optimistic note is sounded in the statement that the critical condition of the railways is largely, though by no means wholly, due to the war, and that it is not unlikely that very far-reaching economic changes may take place in the near future which will relieve the situation of some of its most acute phases.

EXTENSION OF EMERGENCY ACT RECOMMENDED

The principal legislation recommended is an act to enlarge and extend the emergency war-time statute which permits cities and towns in Massachusetts to contribute to the support of street railway lines. In this connection, the department states:

> We are aware of no reason why any community should not, if it deems it necessary for its welfare and convenience after careful consideration of the question, restore or prevent the discontinuance of street railway lines in its limits, either by acquiring such lines and running them as a public venture or by contributing toward their support from taxes. The question undoubtedly presents difficulties, but we cannot agree with one of the speakers who urged at a hearing on this matter that its complexity is a reason why the Commonwealth should assume jurisdiction over and responsibility for all the street railway lines in Massachusetts.
>
> If a street railway serves one particular community alone, the question of the discontinuance of its lines in that locality seems to us a question best dealt with by the particular people served. At any rate, we feel clear that this method should be given a fair trial before any more extensive experienment be made in the direction of the Commonwealth's assumption of obligation.
>
> This seems to us to afford not only the best measure of the necessity of such lines, but also the best machinery for meeting the situation in each locality. We believe, moreover, that the assumption of local burdens, rather than their abandonment, tends best toward the development of democratic institutions.

Other legislation was recommended dealing with cases where several communities may be involved, and one or more refuse to agree to the plan. A proposed act was also submitted, intended to abolish all charges for construction, maintenance or repairs to highways or bridges, and to abolish the commutation tax at present paid by the street railways.

Little Change in Albany Strike Situation

The strike of the employees of the United Traction Company, Albany, N. Y., entered upon its tenth week on April 2. The company has not yet opened all its lines and no move has been made by the men to bring the situation to a close, except the court proceedings to compel arbitration. The notice of appeal filed on April 2 in the Rensselaer county clerk's office by attorneys for the company from the order of Justice Howard to try the arbitration case on April 4 is expected to prolong the litigation.

In the meantime the company is going ahead hiring more permanent employees and the former places of the employees now on strike are gradually being filled.

The jitney situation still remains undecided, no action having been taken by the municipal authorities of Albany and Troy. The Supreme Court through Justice Hinman has stated its attitude as to the further operation of these vehicles in competition with the United Traction Company, declaring that their continued running without municipal consent or authority from the Public Service Commission is a violation of the penal law.

Officers of the railway conferred on April 2 with Mayor Watt and Corporation Counsel McManus regarding action intended to be taken by the city against the jitneys in view of the court's decision. It is understood the traction company is ready to supply additional affidavits for the purpose of enjoining other jitney owners and drivers from operating.

Chew as You Ride.—The Twin City Rapid Transit Company, Minneapolis, Minn., is testing candy and gum slot machines on four interurban cars.

Mr. Allen Arbitrator

Union Officials Reject Proposal of Cleveland Railway for Wage Reduction and Other Changes

Negotiations looking toward a 20 per cent reduction in pay for motormen and conductors on May 1 are now on between the Cleveland Railway and officers of the local union.

On Feb. 1 the Cleveland Railway made a 10 per cent reduction in pay for all officers and employees except the trainmen, with whom there is an agreement that does not expire until May 1. At that time John J. Stanley, president of the company, issued bulletins to the trainmen informing them that he would cut their pay 20 per cent on May 1 and also seek elimination of the war-time emergency allowances regarding overtime, spread of runs, etc.

Cleveland motormen and conductors now get 70 cents an hour for the first three months service, 73 cents an hour for the next nine months and 75 cents an hour after the first year.

In a formal demand on the union Mr. Stanley announces a cut in wages to 55 cents an hour for the first three months, 58 cents an hour for the next nine months and 60 cents an hour after the first year. This was the pre-war standard of wages. Mr. Stanley also demands the setting aside of the article in the company's agreement with the union making certain allowances for overtime, spread of runs, etc. He likewise insists upon the elimination of Sec. 1, of the agreement providing that all trainmen employees of the company must join the union and making provision for having the company collect union dues.

Officials of the union have refused to meet Mr. Stanley's demands. Instead, they have suggested that the matter be arbitrated by the street railway committee of the City Council.

In reply to this Mr. Stanley has informed the union that the present agreement provides a method for arbitration of the dispute. This calls for appointment by the company of an arbitrator, appointment by the men of an arbitrator, these two to select the third, or failing, to have the third man named by Federal Judge Westenhaver.

Mr. Stanley has named as his arbitrator C. Loomis Allen, vice-president and general manager of the Syracuse & Suburban Railway.

Since the developments just noted the conductors and motormen have offered to accept a reduction in pay of 6 cents an hour starting May 1. This offer was made to Mr. Stanley, by officials of the union late on April 4 during the course of negotiations over Mr. Stanley's demand for a wage reduction of 20 per cent. Mr. Stanley rejected the men's offer, insisting that all his demands be arbitrated in accordance with the contract between the company and the union. His demands are:

1. Reduction in basic pay of approximately 20 per cent to a maximum of 60 cents an hour.

2. Abolition of additional pay for Sunday, night and other difficult runs.

3. Abolition of the closed shop agreement.

A year ago the men refused to arbitrate the question of the closed shop and a strike resulted.

Officials of the union made their offer of a wage reduction of 6 cents an hour after Mr. Stanley had turned down an offer to accept a reduction of 3, 4, and 5 cents an hour. The officials of the union in making the offer explained that they would have to have the offer ratified by members of the union as they have so far received no authorization from members to make any offers.

A mass meeting of the members of the union has been called for April 13.

D. U. R. Defeated Again

Plea of Private Line for Service-at-Cost Fails to Impress Voters—Vote Very Heavy

With the preliminary reports received relative to the votes cast on the April 4 election on the two ordinances affecting the railway situation in Detroit, the Detroit United Railway's Service-at-Cost ordinance appears to have been defeated while the city ordinance providing for the purchase by the city of certain Detroit United Railway lines was carried by a large majority.

The first reports showed that the municipal ordinance appeared to be receiving support in every district of the city, none of the early precincts heard from opposing the plan to purchase the lines from the company. Based upon the first count of about one-tenth of the votes cast, coming from widely scattered precincts throughout the city, the company's ordinance appears to have been defeated by a vote of two to one.

Official figures announced on April 5 showed that every municipal question submitted to the voters at the election Monday had carried by a large majority. The piecemeal purchase plan carried by 65¼ per cent vote, while the service-at-cost ordinance failed to obtain more than 35⅓ per cent affirmative vote. The vote on the service-at-cost ordinance was 52,918 for and 92,036 against. On the purchase ordinance the figures were, 96,539 for and 50,704 against.

Before the election on the service-at-cost ordinance, Elliott G. Stevenson, attorney for the Detroit United Railway, stated that the company has from the first conceded that the company's service-at-cost ordinance would require a 60 per cent affirmative vote. The question as to whether or not the three-fifths majority of the votes cast would be required to carry the ordinance was raised by the chairman of the election commission. It was pointed out that there was no expenditure of money involved and the question was raised as to whether the ordinance could be interpreted as a franchise. If it is a franchise then the 60 per cent majority is required.

Members of the commission stated that they believed that the Detroit United Railway had not asked for a ruling on the question. A decision by the Attorney General's Department was sought by the Chairman of the Election Commission. The Corporation Counsel declared that a 60 per cent majority would be necessary to carry the measure.

Large London Workshops

Both the London underground electric railway companies and the London General Omnibus Company are erecting large workshops for heavy repairs and overhaul on what has hitherto been market-garden land near Oction Town Station in the western outskirts of the metropolis. The policy is one of concentration and economy instead of having the work done as at present in a great number of smaller shops scattered over the London area. The railway companies' shops and yards will occupy about 64 acres, while the omnibus company has about twenty-six acres. The former set of shops and equipment will cost about £20,000, but large economies in operation are expected. It is hoped these shops will be ready early next year, while those of the omnibus company are to be finished in July next.

News Notes

Fire Started to Hide Crime. — The ticket office of the Niagara, St. Catharines and Toronto Railway, Niagara Falls, Ont., was recently gutted by fire. Two youths formerly employed as ticket agents have been placed under arrest charged with the theft of $1,000 of the company's funds, and they are alleged to have confessed that they robbed the company and then set fire to the ticket office to hide the crime.

Utility Rate Bill Opposed. — W. H. Johnson, vice-president of the Philadelphia (Pa.) Electric Company, has expressed disapproval of bills introduced in Pennsylvania giving the Public Service Commission power to suspend rates pending decisions. This and other matters of current interest were touched upon by Mr. Johnson at the Eastern Geographical section meeting of the Pennsylvania Electrical Association in Philadelphia on Feb. 24.

Home Rule Bill Lost.—The Oklahoma House in the closing days of the session killed on final roll call House Bill No. 178 which proposed to confer upon cities and towns jurisdiction over rates charged by public utilities. Had the bill passed it would have deprived the Corporation Commission of its control over rates for gas, electricity, water, telephones and street railway service, and would have turned this power over to the various city councils, city commissions and town boards of the state.

Another British Tidal-Power Scheme. —A report is now being prepared in Great Britain on a scheme to utilize the tides at Walney Island to supply electrical energy to the Barrow district of Lancashire, with its great industrial development. As with the similar project for the River Severn, even if all engineering difficulties were overcome, the cost of the enterprise would, conservative authorities think, be likely to prove prohibitive.

$4,000,000 Bridge Proposed.—Governor Warren T. McCray of Indiana has signed a bill authorizing the Governor to appoint a commission to co-operate with a similar commission to be created by the State Legislature of the state of Kentucky, the two commissioners to work out plans for the building of a bridge over the Ohio River at Evansville, Ind. The proposed bridge will be used for traction lines and railroads.

Wage Agreement Renewed Unchanged.—The employees of the Trenton & Mercer County Traction Corporation, Trenton, N. J., will receive the same wages for the coming year as have been paid. This is provided in the new working agreement between the men and company signed on April 2. Employees of cars where two men are used receive 50 cents an hour, while operators of one-man cars are paid 55 cents. The men have asked the company to change the "tripper" schedules.

Program of Meeting

International Railway Congress

Announcement has been made that the ninth congress of the International Railway Association will be held in Rome, Italy, from April 19 to May 1, 1922. Section VIII is that of electric traction. Seven papers will be presented on this subject, the topics being divided up among the different countries. The names and titles of the speakers follow:

Holland and Great Britain—J. W. W. Van Loenen Martinet, chief of electric traction for the Netherlands State Railways. Utrecht.

Belgium—Ernest Gerard, General honorary secretary to the Minister of Railroads, Marine, Posts and Telegraph in Belgium; Manager of the National Light Railway of Belgium, Brussels.

Denmark, Sweden and Norway—Mr. Ofverholm, chief of the Electro-Technical Bureau of the Swedish State Railways, Stockholm.

Italy—Alfredo Donati, engineer, chief of the special Electrification Commission for the General Management of the Italian State Railroads, Rome.

Switzerland—Emile Huber, chief of electrification of the Swiss Federal Railways, Berne.

America—George Gibbs, chief engineer of electric traction, Long Island Railroad, New York.

Other countries—Mr. Sabouret, chief engineer of technical service of the Orleans Railroad, Paris.

Financial and Corporate

Omaha Must Have More

Revenues Must be Increased or Expenses Decreased if Receivership Is to Be Avoided

The Omaha & Council Bluffs Street Railway, Omaha, Neb., is face to face with the necessity of reducing wages or increasing the rate of fare. The whole situation will be unfolded before the State Railway Commission, at Omaha, Neb., beginning May 2. Considerable interest is manifested in this forthcoming hearing at which the company will place its facts and figures on the table, feeling confident at this time that the real status of its financial affairs will result in the needed relief.

The case harks back to May, 1918, when the company first applied to the commission for an increase of fare, from 5 cents to 6 cents. The case involved many ramifications, such as a demand by the men for increased wages and a threatened strike. The commission, on Aug. 10, 1919, issued a temporary order, allowing the company to charge a 7-cent rate, with four tickets for 25 cents. This fare has been in effect since that date. In connection with that order, the commission directed the company to prepare a physical valuation report. This has been completed and will be introduced on the opening day of the hearing this month.

MANAGER FEARFUL FOR FUTURE

R. A. Leussler, vice-president and general manager of the company, points out that in 1920 his company lacked $31,586 of earning enough to pay the 5 per cent preferred stock dividend, and he added that no common stock dividends have been paid by the company for three years. In 1919 the earnings yielded $16,000 over the payment of preferred stock dividends. He further stated that the net earnings in 1920 were $48,816 less than in 1919.

During August, 1919, the wages of motormen and conductors were increased 10 cents an hour and during November of the same year another increase of 2 cents was allowed making a total of 12 cents an hour increase to the men since the fall of 1919. The present scale of wages is from 53 to 57 cents an hour.

"It is no secret," said General Manager Leussler, "that the company must increase its income or decrease operating expenses. We are going before the State Railway Commission on April 25 and let that body determine what is necessary. We must have an increase or go into the hands of a receiver. It is for the commission to say what the rate of fare should be."

The company states that it paid $2.90 per ton for coal during 1915 and that it paid $6.90 per ton in 1920. The total amount of taxes paid by the company last year was $427,861. It is further noted by the company that fares of 10 cents are being paid in 112 cities.

The City Council of Omaha has directed W. C. Lambert, corporation counsel, to represent the city at the hearing before the State Railway Commission and to engage necessary expert assistance.

$18.11 per Share Earned by North American Companies

Excellent results are shown in the thirty-first annual report of the North American Companies for the calendar year 1920 in spite of the difficult conditions under which all public utilities have operated in the last few years.

Gross earnings of the various companies amounted to $39,611,162, an increase of 30.64 per cent over 1919; balance for depreciation, common dividends and surplus was $5,396,288, an increase of 17.81 per cent, equivalent to $18.11 per share of North American stock before reserve, as compared with $15.38 in 1919.

A significant feature of the 1920 report is the small proportion, about 13 per cent, of net income of subsidiaries derived from electric railways operation. More than 71 per cent of net was derived from electric and heating, and the balance from coal and gas operations. This showing and the fact that the companies' entire investment in the United Railway, St. Louis, is carried on its books at $1 dispel any impression which may have prevailed that railway operation is the principal source of subsidiary net earnings.

Growth of the railway business of the Milwaukee Electric Railway & Light Company during the year is indicated by increases of 5.67 per cent, 13.34 per cent, and 13.86 per cent respectively in revenue passengers, car miles operated and car hours. During the year the Milwaukee Electric Railway & Light Company leased from the Wisconsin General Railway ninety-nine new city cars and forty one-man safety cars. The lease was assigned to the Fidelity Trust Company, Philadelphia, as trustee and the latter issued $1,090,000 of ten-year 8 per cent sinking fund equipment trust gold certificates, payment of the par value and dividends of which have been guaranteed by the railway and light company.

Under orders of the Railroad Commission of Wisconsin the ticket rate of fare within the single fare area of the city of Milwaukee was increased in June, and in October rates for electric and heating service were also increased.

Merger Actively Urged

Conference of Railway Representatives with Public Utility Members Suggested at Washington

In the hope that some plan may be evolved for the voluntary merging of the two railways in the District of Columbia, the Commissioners of the District have suggested that two representatives of the Capital Traction Company and two representative of the Washington Railway & Electric Company be appointed to meet with the Public Utilities Commission in an effort to determine how the companies may be consolidated.

ENABLING LEGISLATION DRAWN

It was revealed that the District commissioners practically have agreed to urge Congress to pass the Wood bill which would make the merger compulsory. That bill would substitue for the present tax of 4 per cent on the gross receipts of the railways an excess profits tax of 50 per cent of the net earnings in excess of a 6 per cent return on the amount at which the property is valuated. This would have the effect of relieving the Washington Railway & Electric Company from the payment of any taxes since its earnings probably would not exceed 6 per cent. The Capital Traction Company earns 10 per cent on its valuation.

The Wood bill also provides that the railways are to be merged before the Potomac Electric Power Company is taken over. The bill further relieves the railways from the payment of the salaries of crossing policemen and relieves them of the payment of certain paving charges.

These matters were discussed on April 4 at a conference at the capitol attended by members of the Senate and House committees on the District of Columbia, by the District commissioners and by representatives of the railways.

W. C. Kutz, chairman of the Public Utilities Commission, declared that the commission is opposed to the merger of the Washington Railway & Electric Company and the Potomac Electric Power Company unless it merely is a preliminary step toward the consolidation of the two railways. He expressed the opinion that a merger must be brought about if the railway fare is to be less than 8 cents.

MR. HAM SEES FARE REDUCTION

William F. Ham, president of the Washington Railway & Electric Company and of the Potomac Electric Power Company, declared it would be possible to reduce fares to 7 cents if the power company and the Washington Railway & Electric Company merge and the power company is allowed to charge 10 cents a kilowatt hour for electricity. Mr. Ham also contended that it is an injustice to the railways to require them to pay the salaries of crossing policemen and to pay for paving between tracks and for 2 ft. on each side of the outer rail.

Municipal Railway Falling Behind

$237,797 Lost by City Road on Basis of Comparison of Charges Borne by Private Company

The Municipal Railway, San Francisco, in its annual report for the year ended June 30, 1920, issued recently, shows interesting results. Although it earned $43,000 per mile of revenue track, or more than any year since Exposition Days in 1915, the cost of operation ate it all and more, so that actually operations for the year were conducted at a loss.

NET earnings from operations, according to the method of bookkeeping used on the municipal lines, actually showed a deficit of $6,350. If the comparison charges required by the charter, as shown in the table, are considered as being proper for a basis of comparison with privately owned companies that have to pay such taxes, the loss for the year would amount to $237,797. There was, however, a surplus of $100,110 on operation during previous years, so that the deficit under this basis of comparison would be but $137,687.

Incidentally it might be said that the Municipal Railway, with earnings from operation of $43,000 per mile of revenue track on a single-track basis, is exceeded by only one other strictly overhead trolley system in the country that operated on a 5-cent flat fare basis for the year ended June 30, 1920. Some other companies operating on a 5-cent fare basis were the United Railroads, San Francisco, with earnings of $32,700 per mile, the Brooklyn City Railroad with $46,000, the Louisville Railway with $28,000 and the Southern Boulevard Street Railway (New York) with $31,420 per mile of track.

STATISTICAL INFORMATION—MUNICIPAL RAILWAY OF SAN FRANCISCO

Year Ended June 30:	1920	1919	Per Cent Change
Track owned and operated (miles)	57.97	58.23	*0.436*
Track owned and operated cojointly with United R.R. (miles)	5.15	5.15	......
Carhouse tracks and sidings and unused spurs (miles)	4.00	3.95	1.265
Total (miles)	67.12	67.33	*0.312*
Average total miles of single track operated at end of year	63.12	63.38	*0.410*
Revenue car-miles	7,182,475	....	.....
Revenue bus-miles	236,797	....	.....
Total revenue miles	7,419,272	7,212,763	2.86
Revenue car-hours	....	....	....
Revenue bus-hours	....	....	....
Total revenue hours	795,578	779,746	2.03
Revenue passengers on cars and buses:			
Five-cent cash	53,645,764	47,524,125	12.90
Five-cent government ticket	66,904	69,262	*3.41*
Two and one-half cent school ticket	639,894	597,483	7.10
Two cent revenue transfers	600,296	856,166	*29.80*
Total revenue passengers	54,952,858	49,047,036	12.10
Free transfer passengers	10,757,504	9,836,127	9.34
Free passengers, employes, police, firemen, etc	458,884	458,090	0.17
Total car and bus riders	66,169,246	59,341,243	11.50

The appended tables really speak for themselves, but in order to determine what became of all the money earned comparative figures are printed from the report of the United Railroads, San Francisco, for the same period.

INCOME STATEMENT OF SAN FRANCISCO MUNICIPAL RAILWAY

Year Ended June 30:	1920	1919	Per Cent Change
Revenue from transportation	$2,702,289	$2,391,176	13.00
Revenue from other railway operations	10,147	10,222	*0.73*
Total railway operating revenue	$2,712,436	$2,401,398	12.96
Ways and structures	102,130	63,331	61.30
Equipment	186,947	147,446	26.75
Power	348,383	327,687	6.32
Conducting transportation	1,293,309	1,045,704	23.70
Traffic	666	264	153.00
General and miscellaneous	94,432	70,612	33.70
General and miscellaneous (comparison charges)	4,912*	10,904	*55.00*
Depreciation (14 per cent of passenger revenue)	378,429	334,867	13.00
Accident reserve (4 per cent of passenger revenue)	108,122	95,676	13.02
Total operating expenses	$2,517,330	$2,096,491	20.03
Net operating revenue	195,106	304,907	*56.30*
Taxes (comparison changes required by charter):			
State franchise (5.25 per cent operating revenue)	142,488	126,155	12.95
Municipal franchise (3 per cent passenger revenue)	81,092	71,757	13.00
Municipal car license ($15 per car)	2,955	2,955	......
Federal taxes (1 per cent net income)	....	....	......
Total taxes	$226,535	$200,867	12.85
Operating income	*31,429*	104,040	*129.8*
Non-operating income	27,405	22,248	23.15
Gross income	*4,024*	126,288	*103.2*
Bond interest	233,773	243,093	*3.84*
Net income transferred to profit and loss	*237,797*	*116,805*	103.7
Surplus at beginning of year	100,111	216,916	*77.4*
Surplus at close of year	*137,686*	100,111	*237.80*

* Nothing allowed for legal and office expense.

COMPARISON OF OPERATIONS —YEAR ENDED JUNE 30, 1920

	United Railroads of San Francisco					Municipal Railway of San Francisco				
	Actual	Per C.-M. Cents	Per C.-H.	Per Cent of Operating Revenue	Per Cent of Operating Expense	Actual	Per C.-M. Cents	Per C.-H.	Per Cent of Operating Revenue	Per Cent of Operating Expense
Passenger revenue	$8,938,987	34.85	$3.08	99.30	......	$2,702,289	36.41	3.399	99.63	.....
Revenue from other railway operations	63,124	.34	.02	0.70	....	10,147	.14	.013	.37	.....
Total operating revenue	$9,002,111	35.19	$3.100	100.0	......	$2,712,436	36.550	3.412	100.00	.....
Way and structures	423,853	1.651	$0.145	4.69	6.62	$102,130	1.374	$0.128	3.76	4.06
Equipment	548,955	2.140	.189	6.09	8.58	186,947	2.520	.235	6.90	7.44
Depreciation	(a)	......	......	......	......	378,429	5.099	.476	13.98	15.08
Total maintenance	$972,808	3.791	$0.334	10.78	15.20	$667,506	8.993	$0.839	24.64	26.58
Power	1,357,225	5.300	.467	15.05	21.20	348,383	4.700	.438	12.86	13.87
Conducting transportation	3,471,854	13.550	1.194	38.55	54.20	1,293,309	17.420	1.628	47.65	51.40
Traffic	....	......	......	......	......	666	.009	.001	.03	.02
General and miscellaneous	....	......	......	......	......	202,554	2.730	.254	7.49	8.06
Add general miscellaneous comparison charge	....	......	......	.....	......	4,912	0.066	.006	0.16	0.19
Total general and miscellaneous	$695,874	2.720	$0.240	7.72	10.87	$207,466	2.796	$0.260	7.65	8.25
Credit transportation for investment	*94,463*	*0.368*	*.032*	*1.05*	*1.47*	....	......	......	......	.....
Total operating expenses	$6,403,298	25.000	$2.205	71.18	100.00	$2,517,330	33.918	3.166	92.83	100.00
Net operating revenue	2,598,813	10.190	.895	28.82	40.60	195,106	2.632	.246	7.17	7.76
Taxes	513,200	2.005	.176	5.17	8.02	226,535	3.058	.284	8.36	9.02
Net earnings	$2,085,613	8.185	$0.719	23.65	32.58	*$31,429*	*0.426*	*$0.038*	*1.19*	*1.26*
Revenue miles	25,610,023	......	8.84	......	......	7,419,272	......	9.32	......	.....
Revenue hours	2,906,503	......	......	......	......	795,578	......	......	......	.....

(a) Included in two previous maintenance accounts.

Banks in Indiana Boom Utilities

The Fletcher American National Bank, Indianapolis, Ind., has been running a series of advertisements in the newspapers telling facts about the city and emphasizing the importance of utility companies in community life. The theory of the bank offering these advertisements is that anything that is good for the city is good for the banking business.

The advertising has attracted considerable attention, but no more than a series published by the First & Hamilton National Bank of Ft. Wayne, Ind. This bank has recently printed a series of twenty advertisements under the heading, "For Greater Ft. Wayne." Mr. Warden,. president of the bank, commenting on the "ad," said that the bank believes that it is essential to the growth of Ft. Wayne that people not only take a pride in their public utilities but that they understand better that these utilities must have an adequate return on the investment in order to operate soundly.

Reports of Clark Properties Summarized

Corporations under the E. W. Clark management, Philadelphia, Pa., have reported for the year ended 1920. The Commonwealth Power, Railway & Light Company, controlling properties in the Central West, shows a balance of $797,738 available for renewal, dividend requirements, etc. This is 40 per cent less than the balance of the company for 1919. This decrease is attributed to the increase in wages and to the advance in the cost of coal. Among the other companies reporting are the Bangor Railway & Electric Company, Nashville Railway & Light Company, East St. Louis & Suburban Company, Portland Railway, Light & Power Company and the Cumberland County Power & Light Company. The results of operation of these companies are shown in the accompanying table.

The most appreciable increase in balance was shown in the report of the East St. Louis & Suburban Company where the surplus for 1920 was greater by 5,000 per cent than that of 1919. On the other hand the Commonwealth System showed the greatest decrease in balance. In the case of this company the change amounted to 40 per cent.

Allowances for depreciation were increased materially in the cases of three companies. The Bangor Railway allowed $66,742 for depreciation for 1920 against $58,590 for 1919. The East St. Louis & Suburban Railway allotted $359,417 for depreciation in 1920 against $274,139 for the twelve months of 1919. The Portland Company included in its expenses for 1920 $242,002 for depreciation as contrasted with $257,727 for the same period a year ago.

Actual Worth Valuation

Governor Miller Says Franchise and Going Value Will Not Be Allowed in Readjustment

Frederick L. Cranford, chairman of the Transit Committee of the Brooklyn Chamber of Commerce, has received a letter from Governor Miller of New York in which he states the actual value of the property of the traction companies in New York, and not their franchises and going value, will be considered in any plan of reorganization undertaken by the Transit Commission to be appointed under the traction bill signed recently.

The Brooklyn Chamber of Commerce, through Chairman Cranford, sent Governor Miller a letter on March 16, in which the statement was made that although through the Governor's action the railway matter would be treated as an economic problem apprehension in the minds of the public revolved about three points:

1. The personnel of the commission which it is proposed to create;
2. The possibility of an increase in the present rate of fare;
3. The valuation of the property of the railway companies.

On the valuation matter the chamber said:

> Respecting the basis for the valuation of any physical property of the companies which is to be considered in any plan for a unified system it is our belief that the property thus acquired should be confined to that useful and needed for the operation of the lines in such a system and should not embrace any property of lines whose utility has been superseded; it is assumed that the appraisal will be based on the condition of the property as of the date it is acquired, and its first cost and not upon inflated values.

The Chamber of Commerce then asked the Governor to clear up these points as they could not be explained in the traction bill. In reply the Governor wrote to Mr. Cranford on March 30 in part as follows:

> All the bill does, which is said to be so radical, is to prevent obstruction to the efficient exercise of those powers.
>
> I can assure you that nothing but fitness will be considered in the selection of the commission.
>
> I trust that only such properties will be included in any plan of reorganization as are and will continue to be needed in the public service, and that all properties will be valued at their real worth for such service. No rule could safely be prescribed by statute. The cost of production rule would undoubtedly be unjust to the public at the present time.
>
> The statute excludes franchise and going values. There is no injustice in that, because bankrupt properties can hardly possess such values. The question is what are these properties fairly worth in their present condition for the purpose of reorganization and rehabilitation. It will not require as much time to decide that question as it would to go into the last detail of values, which is ordinarily done in rate cases. As you say the question is one to be decided upon business principles by men of judgment.
>
> The consideration to security holders for the concessions required of them will be a security with an assured fair return in place of one with uncertain or no return. Necessarily, therefore, the rate of fare will be an important element of any settlement and cannot be determined in advance thereof, certainly not in advance of the deposit by the companies of the necessary consents to clothe the commission with ample power to put into effect whatever plan may be determined upon.
>
> The task before the commission is not an easy one. I feel confident that it can be done if approached with resolution, courage and the determination to do exact justice. There must be no such haggling over terms as has attended prior negotiations. The commission must first decide what is just and fair and then insist upon that, no more no less.

Jitneys Collect $350,000 a Year in Seattle

According to a report to Mayor Hugh M. Caldwell by David W. Henderson, superintendent of the Seattle Municipal Street Railway, jitney buses have flourished in Seattle since fares on the railway went up to 8⅓ cents. A one-day check indicates the jitneys are taking nearly $350,000 a year in revenues from the municipal railway. The report is based on a check made by the railway department Jan. 26, compared with a similar check made Oct. 14 last year.

The summary, covering all the jitney routes except the Rainier Valley line, which was omitted because the city does not operate that traction line, shows 1,659 trips were made bv buses Jan. 26, as against 1,482 Oct. 14; that 9,522 passengers were hauled Jan. 26, as against 7,877 Oct. 14. This represents an increase of 177 in number of trips, or 11.9 per cent, and an increase of 1,645 in the number of passengers, or 20.9 per cent. At 10 cents each the Jan. 26 receipts of the jitney operators were $952.20, or approximately $347,553 a year.

	Commonwealth Power, Railway & Light Co. System			Bangor Railway & Electric Company			Nashville Railway & Light Company		
	1920	1919	Increase or Decrease, per Cent	1920	1919	Increase or Decrease, per Cent	1920	1919	Increase or Decrease, per Cent
Gross earnings	$31,285,981	$25,964,899	20.5	$1,262,779	$1,094,675	15.4	$3,675,209	$3,224,384	14.0
Operating expenses and taxes	22,390,298	17,029,303	31.5	800,777	656,598	22.0	2,979,332	2,436,296	22.3
Net earnings	$8,895,683	$8,935,596	— 0.4	$462,002	$438,077	5.5	$695,877	$788,088	—11.7
Interest, etc.	7,020,765	6,516,468	7.7	263,707	253,111	4.2	479,326	475,146	0.9
Balance	$1,874,918	$2,419,128	22.5	$198,295	$184,966	7.2	$216,551	$312,942	—30.8
Pfd. stock div.	1,077,180	1,077,180	....	105,000	105,000	....	125,000	125,000	....
Balance	$797,738	$1,341,948	—40.6	$93,295	$79,966	16.7	$91,551	$187,942	—51.3

	East St. Louis & Suburban Company System *			Portland (Ore.) Railway, Light & Power Company			Cumberland County (Me.) Power & Light Company		
	1920	1919	Increase or Decrease, per Cent	1920	1919	Increase or Decrease, per Cent	1920	1919	Increase or Decrease, per Cent
Gross earnings	$4,368,922	$3,213,152	36.0	$9,564,615	$8,591,001	11.3	$3,114,008	$2,768,600	12.5
Operating expenses and taxes	3,318,196	2,539,504	30.7	6,509,505	5,491,493	18.5	2,142,834	1,813,934	18.1
Net earnings	$1,050,726	$673,648	56.0	$3,055,110	$3,099,508	— 1.4	$971,174	$954,666	1.7
Interest, etc.	651,775	667,523	— 2.4	2,268,267	2,269,972	— 0.1	667,483	672,252	— 0.7
Balance	$398,951	$6,125	....	$786,843	$829,536	— 5.1	$303,691	$282,414	7.5

* Not including Alton Granite & St. Louis Traction Company and Alton Gas & Electric Company.

Ohio Interurban Road Suspends

Inability to make enough money to pay its power bills has caused the Sandusky, Norwalk & Mansfield Electric Railway, Norwalk, Ohio, to discontinue service. The road stopped operating at midnight on March 25. The line owed the Cleveland & Southwestern Railway $9,000 for power furnished during the past six months. State Representative C. G. Taylor has been receiver for the Sandusky, Norwalk & Mansfield line ever since 1913.

Cessation of service on the line has left a score of small communities without any traction service and hundreds of people have to go 5 and 6 miles to reach a steam railroad. The road also carried many school children each day. Scores of customers, including a co-operative farmers elevator and a foundry at North Fairfield have been left without electrical energy by the cutting off of power. The farmers hope, however, that a new syndicate will be formed to resume service on the line.

High wages to trainmen did not cause the road's financial difficulties as the conductors and motormen have been receiving only 35 cents an hour, compared with 66 cents an hour paid by electric interurbans in adjoining territory.

Receiver Taylor made every effort to operate successfully but without result. He said that when the line was built it was financed by the issuance of $800,000 of bonds, with $800,000 of the stock given as a bonus. He adds that so far as he has been able to ascertain less than $400,000 in cash found its way into the property. The line operated 33 miles of track.

2,000,000 Passengers a Year on Municipal Line at Present Rate

The Street Railway Commission of Detroit, Mich., has announced revenues of approximately $9,939 on the operating municipal ownership lines in Detroit for the month of March when 198,789 passengers were carried. This compares with $7,832 for February. The March passenger rate is in excess of 2,000,000 passengers per year. Figured on a daily basis, the average daily revenue during the last half of March showed an increase of 14 per cent over February traffic.

The Board of Assessors has been asked by the Street Railway Commission to place the municipal lines on the tax rolls this year, and it is the contention of the commission to tax the municipal ownership lines by the same method of valuation used in the case of the Detroit United Railway.

The figures relative to the Detroit United Railway earnings since last December have not been given out by the company. Following the annual meeting of the company in February, it was announced that the figures would be made public about April 10, which would be after the election at which the service-at-cost ordinance was to voted upon.

According to a statement by Corporation Counsel Wilcox the audit of the company's account up to December, by special city accountants, shows that the amount of income used to meet the increase in pay of the platform men for which the charging of additional fare was permitted, had dropped from $156,000 to $120,000 from July to December. This is held by city officials to indicate the extent of the cut in service made by the company.

Financial News Notes

Receiver Makes Interest Payments.—By authority of the federal court E. Stenger, receiver for the Denver (Col.) Tramway, has paid interest obligations and sinking fund requirements amounting to $196,650 which became due on March 1 and April 1, 1921, on four of the company's bond issues.

Court Sanctions Interest Payment.—Fearing that the taking over of city street railway lines at Lima would interfere with the operation of the Ohio Electric system, Receiver B. F. Jones secured an order from federal court at Toledo granting permission to pay $8,750 interest due April 1 on $350,000 of second mortgage bonds held in trust by the Fidelity & Trust Company, Buffalo, N. Y.

Toledo Deficit Exceeds $100,000.—The deficit in operating expenses and consequent drain on the stabilizing fund at Toledo, Ohio, have reached above the $100,000 mark now. The next report of the Community Traction Company will be issued on April 11. Many improvements suggested by Commissioner McCann and increased industrial activity in the city are counted on to change this condition.

Additional Rapid Transit Bonds Authorized.—The Board of Rapid Transit Commissioners of Cincinnati, Ohio, has approved a bond issue of $1,500,000 at 5 per cent interest, maturing in fifty years, with a twenty-five-year optional redemption. The issuance of these bonds will bring the total of bond issues for the rapid transit work up to $4,000,000, of which $2,500,000 already has been issued.

Bonds Extended at Increased Interest.—The $500,000 of Portland Lighting & Power Company, Portland, Me., first mortgage 4½ per cent bonds due April 1, 1921, have been extended to April 1, 1931, at 7 per cent. The Cumberland County Power & Light Company now owns the Portland Lighting & Power Company. Sufficient of the Cumberland County first and refunding 5 per cent bonds due 1945 are set aside and held for the retirement of these bonds, but under present financial conditions it is quite impossible to sell long-term 5 per cent bonds except at considerable sacrifice. Consequently the Cumberland company decided to extend the time of payment. A cash bonus of $15 on each $1,000 in bonds will be paid to each holder agreeing to the extension.

Hull Loses Trolley Service.—The last car of the Eastern Massachusetts Street Railway to operate in the little town of Hull made its final trip on April 4. The trustees operating the company had notified the town officials that failure to appropriate the necessary $4,000 to meet the operating deficit would result in suspension of railway service. The town fathers evidently had made other arrangements which seemed to them preferable, for they withheld the desired appropriation, and the day following the cessation of railway service, a line of auto buses commenced to operate over the former railway route.

Certificate of Stock Increase Filed.—The Interstate Public Service Company, which recently took over the utilities corporations in New Albany and Jeffersonville, Ind., including the electric lines to Louisville, has filed in the office of the Secretary of State, Indianapolis, a notice of the increase in the capital stock of the company from $8 000,000 to $15,000,000. Of the stock $10,000,000 is common and $5,000,000 preferred. Companies which have been taken over by the interstate company are the Louisville & Southern Indiana Traction Company, the Louisville & Northern Railway & Light Company, the United Gas & Electric Company of New Albany and Jeffersonville, and the New Albany Water Company. The filing of the certificate is a formality in connection with the deal referred to at length previously in the ELECTRIC RAILWAY JOURNAL.

Cities Service to Double Common Stock.—At the annual meeting of Cities Service Company, New York, N. Y., on April 26, stockholders will be asked to approve an increase in the authorized amount of the common stock of the company from $50,000,000 to $100,000,000, the purpose of the increase being to provide additional common stock for regular stock dividends on the common stock, conversion of outstanding debentures and for other future corporate requirements. Cities Service Company has outstanding $29,192,592 principal amount of convertible debentures, these debentures being convertible partly into Cities Service Company preferred stock and partly into Cities Service Company common stock. In addition, Cities Service Company is now paying stock dividends at the rate of 15 per cent a year in common stock at par on the common stock. Of the present authorized $50,000,000 common stock of the company, $47,985,798 had been issued up to March 10, 1921. In addition to other routine business, stockholders will be asked to authorize, or approve, the action of the directors in making a new contract with Henry L. Doherty & Company as fiscal and operating agents of Cities Service Company, the present contract expiring on May 1, 1921. The annual report of the company for 1920 will be ready April 15.

Traffic and Transportation

Jitneys Off Railway Streets

Kansas City, Mo., Finally Gets Around to a Measure of Reasonable Regulation

A forward step toward such adjustment and regulation of transportation facilities as will best serve the entire community has been taken by Kansas City, Mo., in the passage of an ordinance confining jitneys to streets upon which there are no regularly operated electric railway lines.

The ordinance uses the term "street cars." Following is the paragraph containing the prohibition:

> Section 1. No person, firm or corporation shall drive, run or operate any "jitney" upon or along any street, avenue or roadway within the limits of Kansas City, Mo., upon which there is located a street car track or tracks upon and over which street cars are regularly operated: provided, nothing herein contained shall be construed as prohibiting any "jitney" from crossing any such street, avenue or roadway.

Under other ordinances jitneys must operate only over routes prescribed by a "jitney inspector," a city official. New routes, away from street car lines, are therefore being designated by the inspector and assigned to the various jitney operators; routes of existing jitney lines are readjusted where possible.

The jitney men's association has announced that it will oppose the ordinance by legal steps. Injunction proceedings were brought before a court of the county at Independence, Mo., on March 26 to restrain city officials from enforcing the prohibitory ordinance. The temporary restraining order was issued, returnable on April 2.

Although jitneys have been kept off some of the streets in the down town congested district they have not been regulated in outlying districts. The result is that jitneys have customarily paralleled street car lines and sniped passengers. At first the jitney service was run catch-as-catch-can, but the operators have now been organized for several years and they are preparing to present a united front against the new ordinance and against other regulatory measures.

The jitney association has regulations for the control of its members, enforced by fines and other penalties. These regulations are such as might be imposed by ordinance, though some of them are apparently outside the province of city control. A court is maintained of members before whom offending operators are brought for trial. A jitney patron, another jitney operator, or any person may bring charges against an operator. If the charges are sustained the operator is fined; or, in serious cases, his membership is canceled. Discourteous treatment of patrons, careless driving, violation of traffic rules and similar matters are covered in these hearings.

The possession of a regular revenue enables the association to pursue certain lines of investigation toward improvement of operating factors. One inquiry conducted has resulted in the design of a standard coach body and chassis with a capacity of 15 passengers on 1½-ton chassis. Several coaches made to these specifications have been built to the order of the operators. The ultimate result of standardization efforts was expressed by a jitney association official as follows:

> The operators who can afford the new coaches will buy them; the association will see to it that the owners of these coaches have the favored opportunity on routes. They will get more business because they can give better service. Earning more they will attract the attention of investors, through whom as well as through purchases by other jitney operators the number of standard coaches in service will steadily increase. The next development will be the combining of interests by a few jitney operators; and then will come the consolidation of all the interests under one corporation.

Much publicity is being given to the difficulty encountered by the jitney inspector in selecting routes that will not be objected to by property owners. This situation is being used to advantage to indicate the bitterness of the "fight against jitneys" and the predicament into which the new ordinance has plunged the association.

In a further development of the "location" program there is a reported plan of the jitney inspector to route some jitneys through "Petticoat Lane," or Eleventh Street, the chief shopping thoroughfare in the midst of the retail district—the only downtown east-west street without car tracks. There is only one street north and south in the congested business district without car tracks, Baltimore Avenue, and this street is now a jitney route. Opposition to making of Petticoat Lane a jitney thoroughfare is expected from merchants and public. This hostility is expected to demonstrate further any weaknesses of the new ordinance.

Ten-Cent Fare Suspended

Pending inquiry into the reasonableness of the proposed 10-cent fare on the Princeton line of the New Jersey & Pennsylvania Traction Company the Board of Public Utility Commissioners has issued an order suspending the increase until July 12. The company in submitting the petition for the increase intended that the 10-cent fare should go into effect April 12. The first hearing on the company's application will be held at the State House on April 19. The commission recently replaced a short time ago refused the company permission to increase the fare 1 cent in each zone.

Increased Fare Continued

City of Columbus Insists, However, that $750,000 a Year Be Spent for Improvements

The Columbus Railway, Power & Light Company, Columbus, Ohio, has not as yet taken action looking to the acceptance of the extension of the present rate of fare voted by Council a few weeks ago. Council passed an ordinance authorizing extension of the present rate over the period of the blanket franchise, expiring April 3, 1926, thus amending the section under which the company was authorized to charge a fare of 6 cents cash, or 5 tickets for a quarter, for the period ending in April, 1922, after which the rate was to be reduced to 5 cents cash, or six tickets for a quarter.

6-CENT FARE NECESSARY TO RESTORE CREDIT

The 6-cent fare was extended in response to the company's showing that under the old rate of eight tickets for a quarter it could not restore its credit, make any of the improvements demanded by the Council, or even continue the existing schedule of service. The restoration of normal conditions in the affairs of the company was shown to be impossible if the fare were to be reduced in 1922, for eastern bond houses had agreed to finance required improvements and extensions only if the Council agreed to extend the period of the increased fare.

In return for the authority to continue the present fare during the life of the blanket franchise, the Council asks the company to guarantee that it will expend not less than $750,000 a year for service improvements, extensions, betterments and additional trackage. It is this guarantee which has not yet received the sanction of the company's directors.

PAVING PROGRAM HELD UP

Charles L. Kurtz, president of the company, has been in Mexico for a number of weeks and has just returned. He declared, since his return, that the board of directors are to hold a meeting within a few days to consider the ordinance, and to arrange to meet the conditions of the extension of fare if it could be done.

Much of the work required of the company consists of new paving of Columbus streets and laying of new lines. Paving programs contemplated by the city are being held up pending the company's report of its ability to finance the improvements demanded of it, and to effect such financing its officials must show the security companies that the company's revenues will be adequate to secure any indebtedness which it may incur.

By the terms of the ordinance passed recently the Council will determine whether the company lives up to any agreement which may be reached as to the amount to be expended during the remaining years of the franchise.

Anomaly in Cleveland Suburban Fare Case

Less than 10 per cent of the car riders of Lakewood, Ohio, are now paying a 6-cent fare for their rides to and from Cleveland, although that is the rate the Cleveland riders all must pay, in addition to a cent for a transfer.

At the request of city officials of Lakewood the Common Pleas Court of Cuyahoga County has issued an injunction restraining the Cleveland Railway from demanding a 6-cent fare in Lakewood because the city of Lakewood has a franchise calling for a 5-cent fare.

Up to the time the Lakewood officials obtained the injunction more than 90 per cent of the Lakewood car riders were voluntarily paying the 6-cent fare. The date for a hearing on a permanent injunction has not as yet been fixed by the court.

Car riders who board cars inside the city limits of Cleveland and ask for Lakewood transfers must pay a 6-cent fare, plus 1 cent for a transfer. The court made this amendment to its ruling because some local Cleveland riders were taking advantage of the situation and riding for 5 cents by merely asking for a Lakewood transfer. Lakewood riders, on payment of the 5-cent fare, may transfer to the Cleveland lines without paying a cent for a transfer.

The City Council of Cleveland is threatening to require the railway to cut service to Lakewood, but the Cleveland Railway insists that it will have to obey the court's order and its franchise terms, allowing Lakewoodites to ride for less than Cleveland car riders pay, despite a much longer haul.

Subway Suggested for Seattle

As a result of a study of the transportation problem confronting the city of Seattle, Wash., and of the suggestion of a possible solution of the matter through the construction of a system of elevated railroads and subways, City Engineer A. H. Dimock has submitted to the Mayor and City Council a report covering the subject. The report is signed by Engineer Dimock, Major Carl H. Reeves, Superintendent of Public Utilities, and D. W. Henderson, Superintendent of Railways. The proposed rapid transit plans are not submitted for immediate action, but merely to start discussion and planning on the subject. The project is one of "purely academic interest" at this time, according to Mayor Hugh M. Caldwell.

The plan, in brief, provides for the concentration of traffic from several surface routes in the Third Avenue subway, and to provide stations where passengers may be transferred from surface cars to the trains. Six stations are proposed at advantageous locations. Trains would be operated from these stations on surface routes set apart for their special use. The possible use of motor buses is considered in the plans.

The report states that a possible saving of $1,200,000 over the present plan of operating entirely on the surface may be effected by the proposed system.

Short Skirts Do More than Attract Attention

While the reformers may go about pranting and objecting to the short skirts, the Jacksonville (Fla.) Traction Company has found that the new style dresses have their place in finance. Anyway, the railway at Jacksonville is strong for the "knee-high models." They prevent accidents. There's your reason.

J. S. Harrison, claim agent for the company, announces that the accident figures for 1914 showed 180 accidents in which women figured while boarding or alighting from cars. With the gradual raising of the fair one's skirts has come the same gradual lowering of the number of women-accidents, through the succeeding years until 1920 when, Mr. Harrison reports, there were only seventy-three accidents in which women were involved.

The heel of the shoe catching in the skirts used to be the principal cause of accidents to women, according to Mr. Harrison's figures, but with short skirts at the "height of fashion" there "ain't no such" accidents—except once in awhile where the fair one has turned her back on Dame Fashion. No longer do the ladies have to watch their step. It is the men that may now be found doing that—watching the ladies step.

Expect Increased Rates to Be Sustained

The private bills committee of the Ontario Legislature has approved a bill prepared by the Public Utilities Commission of the city of Port Arthur, allowing the commission to collect a fare commensurate with the cost of service provided the matter is subject to a vote of the ratepayers of the city of Port Arthur and approved by the Ontario Railway & Municipal Board.

The first step in this matter dates back to September, 1920, when the fares were increased to 7 cents cash or four tickets for 25 cents, notwithstanding the statutory limit specified was a 5-cent fare. Soon after placing the new rate into effect the Ontario Railway & Municipal Board declared the rate was illegal and ordered the commission to revert to the old fare.

An appeal was taken to the courts and while the matter was pending the commission prepared the bill mentioned previously. Under this appeal the Public Utilities Commission is continuing to charge the increased fare. It is expected that the Provincial Legislature will pass the bill and that it will become a law with the assent of the Lieutenant Governor in Council some time during June of this year. This will enable the commission to decide upon a rate of fare commensurate with the cost of operation and submit same to a vote of the ratepayers.

Unfair Bus Competition Prevented in Toledo

The City Council at Toledo, Ohio, has passed the bus regulatory measure, but the indemnity bond amounts and license fees were trimmed down by an amendment to the original bill.

The ordinance now requires that buses carrying up to ten passengers must post a $5,000 indemnity bond; those with a capacity of ten to twenty passengers a bond of $7,500; and those above twenty-passenger capacity a bond of $10,000. The license fees for these three classes of buses are $50, $75, and $100, respectively. The drivers license is $1. Originally the ordinance carried amounts from two to three times greater than these. Street Railway Commissioner Wilfred E. Cann and other railway officials believe that the regulation will help to remove some of the ruthless competition of the buses with the railway. The buses have been taking away more than $700 a day from the railway where pavements are good and hauls conducive to short trips.

Improved Traffic Control Proposed for Chicago

Inspired by traffic control methods which they investigated in several Western cities on a recent tour members of the local transportation committee of the Chicago City Council on March 31 voted to recommend their adoption locally.

Experiments will be made at six intersections in the down-town district with a semaphore system similar to that used in Los Angeles. A survey of down-town streets will be made with a view to designating their use for heavy vehicles or automobiles, and also for the possibility of eliminating left-hand turns. It is likely also that certain portions of the space under Michigan Boulevard where it is elevated will be set aside for parking of automobiles, to keep them off the crowded streets.

The local transportation committee also studied results under municipal operation of the electric railway lines in Seattle and San Francisco. It will report on this in the near future.

Jersey Jitney Bill Repassed

Governor Edwards of New Jersey on April 4 vetoed the Elliott bill, placing jitney buses under control of the State Public Utility Commission. He said:

> I am opposed to the measure for the reason that I think the matter of regulation of a local conveyance such as jitneys should be left with the local authority which, in my judgment, is better informed and better equipped to handle the problem. To delegate this work to the utility commissioners would be to increase the work of an already over-burdened board.

The measure placed under the jurisdiction of the utility board all auto buses or jitneys, the routes of which parallel upon the same street the line of any street railway or any other utilities, thus giving to the commission control of all jitneys in the state.

The bill has since been repassed by both houses over the Governor's veto.

So the Public May Know

Cards bearing the names of conductors are being displayed prominently in all the cars of the Monongahela Valley Traction Company, Fairmont, W. Va. An officer of the company explains:

> Courteous treatment always causes a desire on the part of the traveling public to know the names of the crew. There are many occasions when patrons come to us with praise for a conductor, but they do not know his name and do not remember his number. Because of this failure we are unable to let the conductor know that he is being appreciated. On the other hand, the company sometimes has in its employ conductors who are not courteous or who do not give good service. The cards will provide patrons names of these men so they can be reported.

Transportation News Notes

Increases Asked in New Castle.—The Sharon & New Castle Street Railway, New Castle, Pa., has filed a new tariff of rates with the Public Service Commission naming one way and commutation fares between Hubbard, New Bedford and New Castle.

Wheeling Work Divided Up.—Starting with the last week of February every crew working for the Wheeling (W. Va.) Traction Company, with the exception of the men on the Wheeling and Steubenville division, is being worked on six days a week. The company in this way is able to keep its extra crews employed by dividing up the work.

More Trailers for London.—Sanction has been given by the Ministry of Transport to the use of trailer cars on twenty-two additional routes of the London County Council Tramways. This is a material concession, as hitherto trailers have been allowed on only a very few routes. The capacity for coping with the morning and evening rushes of traffic will be very much enhanced.

Police and Firemen Ride Free.—Mandate has recently been served on the Seattle & Rainier Valley Railway to let policemen and firemen ride free, and to refund all fares collected from them. Service was made by Sheriff Matt Starwich, for Thomas J. L. Kennedy, assistant corporation counsel. The action was taken when the Supreme Court denied the company's motion for a rehearing in the case, which the Supreme Court decided in favor of the city.

Five-Cent Fare Continued.—The City Council of Akron, Ohio, under suspension of rules, on March 29 passed an emergency ordinance renewing the 5-cent cash fare ordinance for the Northern Ohio Traction & Light Company, which expired April 1. The 5-cent fare will be continued on city lines until July 1. The negotiations between the company and the city looking toward relief for the railway through an increase in fare have been reviewed previously in the ELECTRIC RAILWAY JOURNAL.

Skip Stops Go at Des Moines.—Des Moines has abandoned the skip stop after three years. Without previous announcement the Des Moines City Railway, through F. C. Chambers and Homer A. Miller, decided to restore the old system the day the change was advertised. There has been almost constant complaint against the practice ever since it was adopted and with the competition being furnished by the buses, which stop upon signal from a passenger, regardless of his location, the receivers for the railway thought it best to do away with the plan.

Southern Company Seeks Increased Rates.—The Columbia Railway, Gas & Electric Company, Columbia, S. C., has applied to the State Railroad Commission for permission to increase fares between Columbia and Camp Jackson. The company is asking for a rate of 2 cents a mile which would mean a 14-cent fare instead of the present 10-cent rate. In its petition the company claims that the returns do not meet the operating costs. The railway is also planning to discontinue the privilege of free transfers. In the city of Columbia the present fare is 7 cents.

Commission Inspector Reports on Crowding.—H. C. Eddy, with a corps of inspectors from the Board of Utility Commissioners of New Jersey, recently investigated the service of the Trenton & Mercer County Traction Corporation and in a special report announced that the one-man cars were overcrowded, and that cars with a capacity of fifty passengers frequently carried as many as seventy-seven people. The inspectors state that the overcrowding of the cars disarranges schedules and decreases safety. It is suggested that the inspectors of the railway should be so distributed as better to handle the crowds. Lack of co-operation on the part of a number of platform men is considered another obstacle. A recommendation has been made that patrons of the railway be required to have the exact fare ready when they board the cars or be made to pay 10 cents for a ride.

Six-Cent Fare Continued.—The Public Service Commission of Indiana has issued an order allowing the Public Utilities Company, operating the city lines at Evansville, to continue the 6-cent fare. In doing this, the commission said that an examination of the company's operating statement for the last three months of 1920 indicates the present fares "have not been sufficient to yield a reasonable return on the value of the property over and above the necessary operating expenses." The 6-cent fare went into effect in Evansville when prices were at the peak as a temporary measure and has been extended from time to time by the commission. When the hearing was held which resulted in the granting of a 6-cent fare, the company contended that it was realizing only a negligible return on its investment over and above operating expenses. The city attorney of Evansville contended that the company placed the value of its property too high. The company introduced as evidence the valuation by a private engineering firm, hired by the company. While the fare remains at 6 cents, patrons can buy twenty checks for $1.

Commission's Rate Power Contested.—The question of the right of the Interstate Commerce Commission to direct the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., to charge 3.6 cents a mile on its electric line between Schenectady and Gloversville was raised on a hearing before Public Service Commissioner Frank Irvine of the Second District recently. The commission had previously issued an order requiring the company to show cause why it is charging 3.6 cents. The company filed its answer at the hearing. It alleged that it is a corporation acting as an interstate and intrastate carrier over which the Interstate Commerce Commission has exercised control and that it is subject to Federal legislation regulating interstate traffic. The company is charging the 3.6-cent rate, it says, because it understands that it is compelled to do so by virtue of the mandatory provisions of the Interstate Commerce Commission's order directing the recent 3.6-cent rate generally for intrastate travel. The company says it is willing to conform to the law and desires a final determination and it suggested that for its protection, the Interstate Commerce Commission be made a party to the show-cause order.

Minneapolis Service Improved Greatly.—Report by the city inspector is to the effect that service by the Minneapolis (Minn.) Street Railway has practically reached the 1917 standard, the maximum of the company's history. In December 403,329 passengers were carried and in January, 1921, 401,772. Despite the decline in passengers the improvement in service continued. Inspector Eugene S. Lund's report reads: The average number of revenue passengers carried on weekdays in July, 1920, was 370,382, as compared with 401,772 in January, 1921, the report shows. The car miles operated in July were 42,986, as compared with 52,621 in January. The average revenue passengers carried per car mile in July was 8.61, while in January it was reduced to 7.64. The number of cars operated in the late rush period in July was 416, as compared with 558 in January. The trips in the rush hours in July were 749 and in January 1,075. President Horace Lowry said: "Passengers are primarily interested in two factors. They expect a seat in the non-rush period and loading that is not excessive in the rush hours. Today we are giving that service. The difference today, compared with the service of 1917, is that we are giving service in the rush hours equal to that of 1917, while in the non-rush hour periods we are using no excessive equipment, but are giving passengers seats."

Legal Notes

INDIANA — *Automobile Occupant with Knowledge of Intoxicated Condition of Driver Held Contributorily Negligent.*

Where the driver and occupants of an automobile colliding with a train had been drinking intoxicating liquors, a member of the party, who knew of the intoxicated condition of the driver in time before the crossing was reached to have left the automobile and avoided injury, was guilty of contributory negligence. [Kirmse vs. Chicago T. H. & S. E. Railway, 127 Northeastern Rep., 837.]

INDIANA—*Motorist Crossing Tracks Without Looking Held Guilty of Contributory Negligence.*

Where a motorist, knowing that street cars were liable to pass at any time, did not look for cars after he passed a building flush with the corner, and had an opportunity to see down the tracks, he must be deemed guilty of contributory negligence, provided he could have seen the approaching car in time to have stopped his vehicle or avoid the accident. [Union Traction Company of Indiana vs. Moneyhun Company, 127 Northeastern Rep., 443.]

MISSOURI—*Error to Exclude Testimony of Claim Agent that None of Defendant's Employees Knew of an Alleged Assault.*

In an action against a street railway company for an alleged assault by a conductor, the court erred in not permitting the defendant to prove by its claim agent, who investigated the case, that the crews on all cars operated on the line where the assault was alleged to have taken place were examined by the witness, and that none of them knew anything of the alleged occurrence. [Brown vs. United Railways of St. Louis, 222 Southwestern Rep., 890.]

NEBRASKA—*Conductor Need Not Warn Passenger that Car Has Not Stopped, or of Danger in Attempting to Alight.*

Where a street car is reducing speed for the purpose of stopping and discharging a passenger, in response to a signal, it is not the duty of the conductor to warn the passenger, who has proceeded to the rear platform with the apparent purpose of being in readiness to alight, that the car has not stopped, or of danger in attempting to alight, unless there is something in the appearance or conduct of the passenger which should reasonably give the conductor notice that the passenger is to some degree helpless or intends from carelessness to alight while the car is still moving. [McCoy vs. Omaha & C. B. Street Railway, 117 Northwestern Rep., 791.]

NEW YORK—*Negligence of Borrower of Automobile Not Imputable to Owner When Car Was Damaged Through Negligence of Railway Company.*

Where an automobile was lent for use and was damaged through negligence of both the borrower and the company, the owner of the car, on the principle of liability of joint tort-feasors, can nevertheless recover for damage from the street railway company, the negligence of the borrower not being imputed to the owner. [Fischer vs. International Railway, 182 New York, Supp., 313.]

NEW YORK — *Removal of Subway Kiosks at Company's Expense Not Compelled.*

The location by a traction company of subway kiosks on the sidewalks of the street under a certificate issued by the Board of Rapid Transit Railroad Commissioners effected a contract between the city and the company, the consent of local authorities having control of streets being obtained, so that when the street was later widened the city could not compel the company to bear the cost of removing the kiosks from the roadway. [City of New York vs. Hudson & Manhattan Railroad, 128 Northeastern Rep., 152.]

NEW YORK—*New York City Not Authorized to Operate Bus or Stage Lines.*

There is no statutory authority for the operation of bus or stage lines by the city of New York on its streets, and such action is forbidden by the charter, except by grant or franchise. Even if the street car service is in a permanent condition of inadequacy the city cannot undertake such a service under the plea of an "emergency," which is a sudden or unexpected occurrence or condition calling for immediate action. A railway company may enjoin such operation. [Brooklyn City R.R. vs. Whalen, 182 New York Supp., 283.]

NEW YORK—*Public Service Commission Held to Have Jurisdiction to Fix Rates Within City Limits of Railroad.*

Under the Public Service Commissions Law the commission has jurisdiction to authorize a railroad organized under the General Railroad Law of 1850 and using private right-of-way acquired under the present Railroad Law across streets in the city of New York to charge a higher rate of fare within the city limits than that prescribed by an ordinance giving the city's consent to the use of streets, since the fixing of such rates was within police power of the state, and since it had fixed the rate to be charged, the city was precluded from making the charging of a specified rate a condition to its consent to use of streets by the railroad. [People ex rel. N. Y., W. & B. Railway vs. Public Service Commission, First District of New York, et al., 183 New York, Supp., 473.]

NEW YORK—*Passenger Has Burden of Proving Carrier's Negligence When Adjustable Seat Collapsed.*

Despite the doctrine of *res ipsa loquitur*, which may be relied on as raising presumption of negligence, a passenger on a car injured when an adjustable seat collapsed has the burden of establishing negligence, for otherwise the carrier would be an insurer. [Slomka vs. Nassau Electric Railway, 182 New York Supp., 156.]

PENNSYLVANIA—*Husband Not Agent of Wife in Procuring Her Signature to Release.*

That a wife stood silent while her husband bargained with the company's claim agent will not constitute her husband her agent and render her bound by his acts in procuring a settlement and in obtaining her signature to a release, the wife maintaining that the release was obtained by fraud. [Ralston vs. Philadelphia Rapid Transit Company 110 Atlantic Rep., 335.]

SOUTH CAROLINA—*Franchise Held to Obligate Grantee to Build Extensions.*

A street railroad franchise which stated that, in consideration of the construction and operation of the railway within the city and its extension and operation to designated points outside the city, the city remitted all license taxes, provided that until the extensions were made the taxes should not exceed a stated sum, was a contract binding the company to construct the extensions, not merely permitting it to do so. [Thomas vs. Spartansburg Railway, Gas & Electric Company, 103 Southeastern Rep., 149.]

WISCONSIN—*Reasonableness of Rates Depends on Effect on System as a Whole.*

Where a street railway and a suburban railway were operated as one system, the reasonableness of rates fixed by the Railroad Commission as to the operation of the suburban line is not affected by the fact that such line will be operated at a loss under the rates so fixed, the test of reasonableness being the effect upon the system as a whole. [Milwaukee Electric Railway & Light Company vs. Railroad Commission of Wisconsin, 177 Northwestern Rep., 25.]

WISCONSIN—*Stopping of Street Car Not Invitation to Traveler to Cross Street.*

The stopping of a street car at a customary place for discharging and taking on passengers is not an invitation to a traveler in an automobile to cross ahead of it, and if he is so situated that the car can safely start and safely continue, provided he yields the right of way and can safely do so, the car can proceed upon its trip. [Dering vs. Milwaukee Electric Railway & Light Company, 176 Northwestern Rep., 343.]

Personal Mention

C. P. Taft to Resign from Ohio Traction Company

Charles P. Taft, publisher of the Cincinnati (Ohio) *Times Star* and brother of the former president of the United States, William Howard Taft, has submitted to President W. Kelsey Schoepf his resignation as first vice-president and director of the Ohio Traction Company, Cincinnati, Ohio, and as a member of its executive committee. In his letter of resignation Mr. Taft assigns no reason for his action. The resignation will be presented to the board of directors for their consideration at their next meeting.

Mr. Taft recently was instrumental in forming a stockholders' committee of the Cincinnati Street Railway to look after the interests of that company in the developments in the railway situation in Cincinnati. This committee was formed at the time the Cincinnati Traction Company and the Cincinnati Street Railway named special committees of their boards to enter upon negotiations for a revision of the terms of the lease, the franchise and the capitalization of the companies.

It is understood that Mr. Taft will continue to serve as a member of the directorate of the Cincinnati Street Railway. The significance of Mr. Taft's action is that, although he is largely interested in both companies, he will devote his attention and influence to the interests of Cincinnati Street Railway in the pending negotiations.

Airplane Used to Inspect Power Lines

P. H. Chase, chief electrical engineer for the American Railways, and W. R. Power, general manager of the Ohio Valley Electric Railway and the Consolidated Light, Heat & Power Company, have demonstrated that it is possible to inspect high-tension lines by airplane. The test was made in a new Curtis "Oriole," with Bob Shank, a local aviator at Huntington, W. Va., as pilot. The flight was started from Kyle field, the home grounds of the aërial taxi, and continued to Hurricane, in Putnam County, a distance of 25 miles and return.

The line inspected is being constructed by the Virginia Power Company from Cabin Creek, in Kanawha County, to Huntington. The pole lines are now completed to the southeasterly limits of the city and the wire itself has been brought down the valley to a point near Milton.

Mr. Chase and Mr. Power said that they found it entirely possible to make the inspection from the airplane. They said that in the event of trouble a flying inspector could see from the air whether a mishap was due to slide or a break in the wire. This method of getting a bird's-eye view of the line will make it possible to save much time in the location of trouble and thus help to render better service.

J. R. Ong Goes South

Former Transportation Engineer in Winnipeg Takes Similar Position with Georgia Railway

J. R. Ong has accepted a position with the Georgia Railway & Power Company, Atlanta, Ga., as transportation engineer. This opening was created last month by the organization of a new department within the transportation department for the purpose of increasing the efficiency of the transportation service. Mr. Ong reports to the manager of the railway department and works directly with the transportation department in building and fitting schedules for the operation of cars to meet service requirements.

J. R. ONG

The new transportation engineer will carry on a continuous traffic survey over all lines so that the car service furnished to the public can be fitted to the needs of those who use the service. Having arrived at definite information relative to the exact number of passengers to be expected on given lines at given times, Mr. Ong will be in a position to make up schedules which will be for the best interest of the public and company. This will relieve the transportation department of similar work and will leave the transportation department free for the operation of cars to meet the new schedules as outlined.

Mr. Ong was graduated from Purdue University in 1909. His practical railway experience began in the car shops and power plants during the construction and early operating period of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., and the Chicago, Lake Shore & South Bend Railroad, Michigan City, Ind. After he was graduated from Purdue he became an apprentice in the East Pittsburgh works of the Westinghouse Company and was later transferred to the Philadelphia sales office of that company. In 1911 he became superintendent of substations on the Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa.

In December, 1911, Mr. Ong accepted the appointment as electric railway engineer on the joint engineering staff serving the Railroad Commission of Wisconsin and the Wisconsin Tax Commission. In this position he specialized on transportation matters and made extended studies for the Railroad Commission relating to operating matters and service on the electric railways of Wisconsin. After serving with the Wisconsin Commission for some time he resigned to accept the position of traffic engineer for the Board of Control of the Kansas City (Mo.) Railways. In 1918 he resigned that position to become transportation engineer with the Winnipeg (Man.) Electric Railway.

Mr. Culkins Resigns

All Cincinnati Agog Over Return of Street Railway Director to Commerce Body

Announcement was made on April 6 of the resignation of William C. Culkins as director of street railways at Cincinnati, Ohio, for the city government. At the same time James A. Reilly, president of the Chamber of Commerce, announced that Mr. Culkins would succeed Charles R. Hebble as executive secretary of that body. Mr. Hebble has held the position during the past three years.

These changes in themselves caused a considerable stir, but on the heels of this news came also intimation of dissension among committeemen representing two sets of stockholders interested in plans for the reorganization of the Cincinnati Traction Company, operating in Cincinnati, several traction lines in the state and a construction company. It will be recalled that Mr. Culkins several months ago demanded an accounting in connection with intercompany charges of $350,000 in accounts involving the Cincinnati Traction Company, the Cincinnati Car Company and the Ohio Traction Company, in transactions concerning the purchase and sale of materials, certain leases and power rentals.

This demand for an accounting, Mr. Culkins said, was necessary to determine whether or not the Cincinnati Traction Company actually had lost an amount of money sufficiently large during the preceding two months to warrant an increase of fare applied for on March 1, under the service-at-cost franchise.

To bring about a readjustment or reorganization of the traction companies, there were created at the suggestion of Mr. Culkins two special committees of stockholders, one representing the Cincinnati Street Railway and the other the Ohio Traction Company. This last company controls the operation of the Cincinnati Traction Company.

In a formal statement announcing the change, Mr. Reilly said:

> Mr. Hebble having resigned his position as executive secretary of the Cincinnati Chamber of Commerce, the board of directors authorized the president to tender the position to William C. Culkins, the present director of street railways.
>
> Mr. Culkins expressed reluctance to make a change during the pendency of the street railway reorganization which is being worked out in compliance with his order. However, after a conference with Mayor Galvin and myself, he decided to accept the proposition with the understanding that in compliance with the wishes of the Mayor he would continue in his present position, along with his new duties in the Chamber of Commerce until May 1, by which time it is hoped that the street railway problem will have been substantially solved, and with the further understanding that thereafter he is to place all of his information and services at the disposal of the city in connection with any pending suits or other litigation or questions with the traction company.

The position of executive secretary of the Chamber of Commerce will not be new to Mr. Culkins, for he held the office at the time of his appointment to the office of street railway director by Mayor Galvin.

Mr. Hebble, who has tendered his resignation, succeeded Mr. Culkins as executive secretary in 1917 and has held the office until this time. Other than to say that he had made no plans for the future, Mr. Hebble refused to discuss the affair. He entered the service of the Chamber of Commerce in January, 1914, as manager of the civic and industrial department under Walter Draper, then president of that body, holding that position until he succeeded Mr. Culkins.

Mr. Hebble will continue to fill the duties of the office until such time as Mr. Culkins is ready to succeed him.

Recent Visitor to America in New Work

Gotthard Diedon, who spent several weeks in this country last fall studying electric railway practice, has relinquished his position as managing director of the street railways of Gothenburg, Sweden. He is now director of the harbor of Gothenburg, which, like the railways, is a municipal property, and is one of the most important of Swedish harbors.

A short time ago, Mr. Diedon, in a letter to one of the editors of this paper, said that he regrets that he will not be able to put into practice the experience and new ideas obtained through his studies here. He pays a very high tribute to the personnel of American railways by saying that the industry was fortunate in having managers, engineers, and other officers of such high ability and intelligence, because the standing of the street railways in this country is considered good in view of the extraordinary conditions prevailing for the last few years.

L. A. Downs Heads A. R. E. A.

Vice-President and General Manager Central of Georgia Railway Elected at Annual Convention

Lawrence A. Downs, vice-president and general manager of the Central of Georgia Railway, was elected president of the American Railway Engineering Association at its twenty-second annual convention, held at Chicago on March 15-17. He succeeds A. Stafford as president of the association.

Mr. Downs entered railroad service in February, 1895, with the Vandalia Railroad. From 1896 to 1898 he was in the engineering department of the Illinois Central Railroad, and for nine years following was roadmaster on the Amboy, Louisville, Louisiana, Westfield and Chicago divisions of that road. From 1907 to December, 1910, he was assistant engineer, maintenance of way, of the Illinois Central. In December, 1910, he became division superintendent of the Iowa division and later of the Minnesota and Kentucky divisions.

L. A. DOWNS

In January, 1915, he was made general superintendent of the southern lines and in August, 1916, general superintendent of the northern lines of the Illinois Central. Three years later he became assistant general manager of the road. He was appointed vice-president and general manager of the Central of Georgia Railway in March, 1920.

Mr. Downs was born in Greencastle, Ind., in 1872. He is a graduate of Purdue University in the class of 1894.

E. B. Hardin was appointed auditor of revenue for the Piedmont & Northern Railway, Charlotte, N. C., on April 1. Mr. Hardin will handle all freight and passenger revenue accounts. Mr. Hardin had this position with the company until 1919, when he resigned to engage in other business, at which time this work was placed under the general auditor. His coming back at this time places the auditing work of the company on the same basis as it was previous to 1919.

H. C. Hoagland, formerly vice-president and general manager of the Central Oklahoma Light & Power Company, has resigned to become general manager of the Oklahoma Natural Gas Company. Mr. Hoagland during the last ten years has served at different times as manager of the Muskogee Gas & Electric Company, Muskogee, Okla., and the Fort Smith Light & Traction Company, Fort Smith, Ark., in addition to the position he is now leaving. All these properties are operated by the Byllesby Engineering & Management Corporation, Chicago.

Dr. E. W. Miller has been advanced by the Milwaukee Electric Light & Railway Company, Milwaukee, Wis., to fill the positions of the late Dr. Charles H. Lemon, who for twenty-five years had been chief surgeon of the company and medical director of the Employees' Mutual Benefit Association since its organization nine years ago. Dr. Miller has during the nine years that he has been connected with the company, served both the E. M. B. A. and the company as assistant to Dr. Lemon. So he has been in constant touch with the development of the association and has had much to do with the development of its medical work and other activities. The new medical director is a graduate of the University of Chicago and of Rush Medical College. He had experience in Colorado and the iron country of upper Michigan before going to Milwaukee.

Obituary

Clarence Dallam, formerly solicitor and assistant to the president of the Louisville (Ky.) Railway, is dead. Mr. Dallam was connected with the railway's legal department for about eighteen years. He resigned his position last July. He was a prominent member of the Louisville bar.

T. J. Oliver, one-time owner and operator of the railway system in Dallas, Tex., died recently in McAlester, Okla. Mr. Oliver was for years senior member of the banking firm of Oliver & Griggs, once a leading financial institution of Dallas. Mr. Oliver was eighty-seven years old. He retired from active business many years ago.

Homer J. Hodson, who was in charge of the department of safety and fire inspection of the East St. Louis & Suburban Railway Company, East St. Louis, Ill., died at the St. Joseph's Hospital in Alton, Ill., on March 6 following an operation for appendicitis. Mr. Hodson was thirty-one years old. He was well known by a great many transportation men on account of his activities in the National Safety Council. In the council Mr. Hodson was chairman of the railway section of the bulletin committee. He was also state officer of the American Legion.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Good Stocks of Lightning Arresters

Prices Steady Since Reductions of Ten per Cent—Deliveries Are Immediate. but Market Remains Quiet

Sizable stocks of railway lightning arresters are held by producers awaiting the call of car builders for new equipment and railways for replacements. Deliveries are immediate, but as yet the anticipated spring business in this line has not opened up to any great extent. Some producers are optimistic, however, and report that there has been quite an increase in sales recently, though one large manufacturer estimates that demand just now is only 25 per cent of normal. Considerable success has been met in pushing sales of the condenser type of arrester and this is more and more taking the place of old-type equipment, it is stated.

Production has generally been held to low levels as a result of the existing quiet market. In view of the prompt deliveries that can be made producers are inclined to believe that railways are holding off buying until summer and the lightning factor is actually at hand. Ordinarily it would now be growing late for this class of business to be placed. Prices have held steady since general reductions of 10 per cent were made the middle of February.

Lower Prices of Insulating Tapes and Cloth

Stocks Are Held Low Though Immediate Shipments Are Made—Manufacturers Optimistic

Although prices of insulating material in general have for some time been about holding their own, further reductions on a few items have been announced recently. A standard grade of friction tape was reduced in price 6 cents per pound on April 1, a drop of 15 per cent. On the same date all varnished cloths were reduced about 7 to 8 per cent by the same company. On March 28 another manufacturer lowered the price of woven cotton tape, the cut on the 1-in. width being from $1.42 to $1.10 per pound.

The general view expressed by representative manufacturers is that prices in this line can hardly go lower. Cotton, rubber, shellac, etc., are all at unprecedently low figures, and the general average drop on all classes of finished insulating material has amounted to at least 33⅓ per cent, according to the estimate of a well-known manufacturer. Spot cotton at New York is quoted at 12.05 cents per pound at present. Consumers, however, apparently are not yet satisfied that insulation prices have hit bottom as buying remains from hand to mouth for the most part.

Electric railways are making light repairs. Repair shops are buying such material as they need, but their present requirements are small. Manufacturers of finished products such as motors have greatly curtailed production. There is a pretty good industrial market for motor repair work, especially steel mill, at present. These outlets account for a considerable number of orders that are being received, but each order is usually small in size. There is little question that the existing market is quiet and will probably remain so for some time. Distinct optimism is manifest among manufacturers, however, as the expectation of better business persists. There has been, in fact, some slight trend toward improvement already noticed in some quarters in the number of inquiries which were received last month.

Stocks of finished material have been purposely kept rather low by producers, who have materially curtailed production under present market conditions. The supply of finished material, however, is in virtually all cases quite adequate to cover present needs with immediate shipments.

Excellent Deliveries Quoted on Special Trackwork

Producers Are Keeping Rail Stocks Rather Low—Prices Are Somewhat Lower and the Outlook Is for Improvement

Electric railways which may yet be considering coming into the market for special trackwork this spring should meet with excellent delivery conditions. At present there is keen competition for business among producers and with not a large volume of orders on hand deliveries are obtained very promptly. The average time within which manufacturers state that they can fill orders ranges from three to six weeks. For export shipment in some cases and also on some of the more complicated layouts the time in which orders can be filled extends to as much as eight weeks.

In general makers of trackwork who do not roll their own rails report they are keeping stocks of straight rail sections at fairly low levels. In view of the existing quiet market and the considerable tonnage which rail mills would still be able to take on, little difficulty is experienced in replenishing stocks. Frequently, however, especially on girder rails where the tonnage desired is often small, orders are held for a sufficient tonnage to warrant rolling.

Prices quoted on special trackwork are now lower than they were some time ago, but as each order is really an individual job it is impossible to gain a representative idea from producers as to how much prices have declined, though a minimum of 10 per cent would seem at least a very conservative estimate. Open-hearth standard T-rails are still quoted at $47 per ton, but grooved girder rails which on Jan. 5 were quoted in ELECTRIC RAILWAY JOURNAL at $88 per gross ton have undergone some reduction. A nominal quotation at the present time would be $75 to $80 per ton, but a price as low as $67 per ton on an order of 1,000 tons has been made recently.

Producers are generally still optimistic that business in this line will show some improvement later this year, but at the same time there is little hope that the total volume of sales in 1921 will compare very favorably with normal buying years. Steam roads, following reductions in price to $47 per ton by independent producers of standard T-rails, placed a fair amount of orders for special trackwork but have remained inactive since. Electric railways, where money has been available, have entered the market in fair number but in most cases for small repair orders only.

There are certain hopeful signs visible on the horizon, however. The seemingly inevitable ultimate reduction of wages offers an important outlet for lower costs while the need for higher fares is apparently receiving increasing legislative recognition. Steam railroads too have not yet received payment of money due them from the period of federal control and a readjustment of freight rates would very possibly increase business there.

Tenders Asked for Equipment for Railways in South Africa

Tenders are being invited, according to Trade Commissioner Stevenson of Johannesburg, South Africa, for supplying overhead equipment, switches, gears and accessory track equipment for electric railways in South Africa. Specifications covering this equipment are on file with the South African High Commissioner, Trafalgar Square, London, England, copies of which may be obtained at £5 2s. for the first copy and £2 2s. for each additional copy. Bids are to close June 22.

Window Glass Prices Drop About 20 per Cent

Production Is at Minimum and Stocks Are Not Large—A Resumption of Buying Would Push Deliveries

Effective April 1, the price of window glass has been reduced by manufacturers between 19 and 21 per cent. The new discounts announced by the American Window Glass Company, f.o.b. factory with the usual boxing charge extra, are 82 per cent on single strength, both A and B quality; 83 per cent on double strength, A quality, and 85 per cent on double strength, B quality. These compare with discounts of 77, 79 and 81 per cent respectively that have all along been quoted as the market. The above new discounts apply to the list prices dated Oct. 15, 1912.

The lowering of producers' prices will not have the effect on consumer's cost that at first seems evident inasmuch as virtually all jobbers anticipated this decrease some time ago and lowered prices on their own initiative, taking a loss for the sake of moving their stocks.

The present market is extremely quiet, with very little buying from any source, though it is said that the electric railways are ordering for repairs better than are the steam roads this spring. There are several factors in the market, however, that lead glass manufacturers to take an optimistic view of the situation. Probably the chief one is the certainty of an increased demand from the building trade before very long. Another is that there is virtually no large surplus of glass anywhere in the country at present. Some jobbers are still overstocked, but in general their efforts to reduce inventories have been successful, while the policy of glass manufacturers in cutting down production to a minimum has eliminated a surplus on their part.

Production at this time, it may be safely said, is down to about 20 per cent of capacity, or very little above even the present light consumption.

There is considerable cheap Belgian glass on the market, it is true, and in fact low-priced foreign competition has been a very important factor in the slump which the industry in this country has taken. There is, however, little or no supply of foreign glass on the market such as would affect railway requirements.

Labor prices are an important part of the cost of glass manufacture and so far as the hand workers in the industry are concerned there has been no wage cut. As the "hand-operated" factories are all shut down the wage question will probably be reopened again on their resumption of operation in the fall.

Whether wages of machine operators have been reduced or not it has not been possible to learn, but there has been no general cut, at least of the skilled workers.

General Electric's Report Shows Record in Sales

The twenty-ninth annual report of the General Electric Company for the year ended Dec. 31, 1920, shows a record of sales billed never approached by any electric manufacturing company. These billings amounted to $275,758,487, an increase of $45,778,504 over those for 1919. The net value of orders received was $318,470,438 as against $237,623,932 for 1919. At the end of the year the amount of orders unfilled, after eliminating all cancellations, was $111,778,000, compared with $98,880,000 at the close of 1919. Reduction of inventories to market values of Dec. 31, 1920, amounted to $17,803,985.

The unprecedented amount of orders received during the first seven months of the year, plus unfilled orders at the beginning of the year, resulted in more urgent efforts, in a difficult situation, to add to manufacturing facilities, and during the year the company added 2,052,000 square feet of owned factory floor space and 1,768,000 square feet leased with option to purchase. Present manufacturing space amounts to 24,501,000 square feet.

At the close of 1920, inventories at factories amounted to $93,574,114 and at warehouses, in transit, on consignment, etc., amounted to $24,535,059, a total of $118,109,174, as against $83,978,463 at the close of 1919. The following item of customers' accounts and notes receivable, carried at $64,962,682, which is an increase of $19,077,154 over the balance shown at Dec. 31, 1919, is an indication of the way bills are being paid. Total outstanding capital stock at that date was $139,026,900.

Westinghouse Air Brake Has Satisfactory Year

The Westinghouse Air Brake Company, Wilmerding, Pa., under date of April 1, has issued its annual financial statement for the year ended Dec. 31, 1920. The volume of orders received and product shipped during the year, it is stated, was satisfactory. Net profits for the parent organization and all subsidiary companies were $6,580,403, which, after deducting estimated federal taxes and dividends paid out, leaves a surplus of $1,249,122 to be added to the $14,891,457 surplus on hand as of Jan. 1, 1920.

The year 1920 closed with a fair amount of orders on hand, it is stated, but current orders show a marked falling off as compared with previous years. Manufacturing operations of the company thus far this year have been at an almost normal rate, but must be reduced materially unless there is a marked increase in new business. Considering prevailing conditions abroad the operations of the several foreign companies which the Westinghouse Air Brake Company wholly or partially controls were considered very satisfactory.

Inventories, including material, supplies, goods in process and finished stores priced either at cost or market, whichever was lower on Dec. 31, total $15,628,811. The report states that it is hoped that passage of the Winslow bill by Congress will result in payments which will reduce outstanding accounts totaling $13,550,168 to normal proportions.

Tenders on South African Railways Asked

The tenders for the conversion to electric traction of the Cape Town-Simon's Town and the Durban-Maritzburg sections of the South African Railways are due in by May 3. There are seven separate specifications relating to each line. For the first of the lines named these items are: Motor cars and underframes, motor trucks, electric equipment of cars, substation equipment, power house transformers, boilers, boiler house equipment, turbo alternators and condensing plant.

For the Durban-Maritzburg line the specifications are: Electric passenger and freight locomotives, electric yard locomotives, substation equipment, turbo alternators, boilers and boiler house equipment, condensing plant and transformers for substations and power stations.

Rolling Stock

Texas Electric Railway, Dallas, Tex., which owns and operates the street-car system in Corsicana, Tex., has purchased three new one-man cars for service there. With these cars, a fifteen-minute schedule will be maintained on the city lines.

Track and Roadway

Kentucky Traction & Terminal Company, Lexington, Ky.—Chief Engineer McLeod has informed the Commissioner of Public Works that the Kentucky Traction & Terminal Company will begin work as soon as the weather permits on track repairs.

Detroit (Mich.) Municipal Street Railway.—F. M. Meyer, city purchasing agent of Detroit, is in Spokane inspecting poles and arranging for a contract award for 3,000 poles, 35, 36 and 40 ft. long. The purchase calls for an expenditure of about $65,000.

Trenton, N. J.—The Trenton (N. J.) City Commission has instructed the Trenton & Mercer County Traction Corporation, the New Jersey & Pennsylvania Traction Company and the Public Service Railway to improve the paving on streets in Trenton where their lines run.

Oklahoma Railway, Oklahoma City, Oka.—The Oklahoma Railway is making track improvements in the downtown section of the city which will cost approximately $4,000.

Memphis (Tenn.) Street Railway.—The Memphis Street Railway expects to have to reconstruct about 2,200 ft. of double track and 2,000 ft. of single track on North Second Street. This is now T-rail and will be replaced with girder rail. The reconstruction will be necessary to meet the city's plan of repaving the street, using asphalt.

Memphis (Tenn.) Street Railway.—Track improvement, which will provide for the rerouting plans contemplated by the Memphis Street Railway, will be started about April 15. Commissioner Johnson has stated that the work was waiting for the delivery of curves, switches, etc.

Dallas (Tex.) Railway.—The Dallas Railway will begin work on the extension of its line on Fairmount Street, that will reach the Parkland City Hospital, near the middle of April, according to announcement by Richard Meriwether, vice-president and general manager. The line will extend out Fairmount Street to Oaklawn Avenue within one block of the city hospital. Work has been held up on account of bridge work on Turtle Creek. It is expected that the line will be completed within five months. This is one of the extensions for which the Dallas Railway is committed under the terms of its charter.

Indiana Service Corporation, Fort Wayne, Ind.—The Indiana Service Corporation has agreed with the International Harvester Company to extend the line to the company's big new truck plant east of the city as soon as the plant is completed.

Power Houses, Shops and Buildings

Southern Public Utilities Company, Charlotte, N. C.—The Southern Public Utilities Company has rebuilt its Second Street, Winston-Salem electric power station and has equipped it with modern transformers. Already $150,000 has been spent and many thousands more will be expended in completing the reconstruction and redistribution improvements.

Mobile Light & Railroad Company, Mobile, Ala.—The Mobile Light & Railroad Company has under contract with the Westinghouse Electric & Manufacturing Company a 1,000-kw. turbine and 550-600-volt generator with condenser. The company has completed a steel and concrete carhouse 100 ft. x 200 ft. having eight inspection pits together with a large amount of yard storage. An office for the transportation department has also been completed.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—A new power substation will be constructed at Curtis, Utah, on the Salt Lake & Utah Railroad this summer, at a cost of $50,000. Curtis is 5 miles north of Provo, on the main line of the road, and this will be the fifth substation on the line between Salt Lake and Payson, the other four being at Granger, Bringhurst, Lindon and Springville. The new power substation is expected to be completed by September.

Trade Notes

The Standard Paint Company, 95 Madison Avenue, New York City, manufacturer of weatherproofing products, announces a change in its corporate name to the Ruberoid Company.

E. I. Du Pont de Nemours & Company, Inc., is putting out uniform caps made of pyroxylin coated goods (leather substitute) which is waterproof and made in colors to match the uniform.

The Conveyors Corporation of America, Chicago, announces the appointment of Robert B. M. Wilson as sales engineer of the Chicago district, with E. M. Wolfe associated with him as an assistant.

The Universal Crane Company announces the removal of its plant from Cleveland to its new factory at Elyria, Ohio. The company has greatly increased its capacity and production is now under way in the new plant.

Daniel J. P. Jones, formerly connected with the Chicago office of the Economy Fuse & Manufacturing Company, has been appointed sales representative of the company in Michigan and will have his headquarters in Grand Rapids.

E. G. Le Laurin has resigned as Southern sales representative of the Southern Supply & Hardware Company, St. Louis, to become associated with W. D. Jenkins, representative for railway equipment and supplies, Dallas, Tex., looking after the Dallas-Houston-New Orleans territory.

The Hopewell Insulation & Manufacturing Company, Hopewell, Va., announces that it is now represented in Chicago by the Midstates Engineering Company, Westminister Building, which company takes in the district of Ohio, Indiana, Illinois, Michigan, Missouri and Wisconsin.

The Barney & Smith Car Company, Dayton, Ohio, will not be funded under the plan described in the March 19 issue for financing the working capital requirements of the company by an issue of $2,000,000 second mortgage, 7 per cent bonds. An insufficient amount of subscriptions were received and other measures will have to be devised for the continuance of the company's business. Directors of the company will meet next week to consider further steps toward clearing up the company's finances.

The Under-Feed Stoker Company of America, Book Building, Detroit, has placed its Western selling agency with the Merkle Machinery Company, of Kansas City. The selling agency has branches in Omaha, Neb., and Tulsa, Okla., selling, designing and installing machinery for power and pumping plants. The Salt Lake City agency has been placed with N. L. Alison, 616 Newhouse Building. The company also will be represented in the Southern territory through Smith & Whitney, Southwestern Life Building, Dallas, Tex.

A. J. Manson has been appointed manager of the Railway Division, New York office of the Westinghouse Electric & Manufacturing Company. After graduating from Massachusetts Institute of Technology in 1905 Mr. Manson entered the company's engineering apprenticeship course. He was active in the electrification of the New Haven Railroad and the Pennsylvania Railroad into New York City and during the past few years has been connected with the sales organization in New York.

Engineering Business Exchange, New York, announces the opening of a Southeastern branch with Marshall O. Leighton, consulting engineer, of Washington, D. C., as director. Mr. Leighton was for a dozen years one of the principal officers of the United States Geological Survey. During the past three years he has been chairman of the National Service Committee of the Engineering Council. Associated with Mr. Leighton in carrying on the Exchange will be A. C. Oliphant. The Southeastern branch of the Engineering Business Exchange has offices in the McLachlen Building, Washington, D. C.

New Advertising Literature

Seats.—The J. G. Brill Company, Philadelphia, Pa., has issued leaflet No. 248, describing "Brill Seats for Motormen and Conductors."

Rails.—The Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has issued bulletin No. 9 in its series of reports on open-hearth rails.

Pulverized Coal.—The Fuller-Lehigh Company, Fullerton, Pa., is distributing bulletin No. 600, entitled "Pulverized Coal for Boilers."

Brush Holders.—D. B. Flower, 1217 Spring Garden Street, Philadelphia, is distributing two leaflets covering different types of Flower brush holders for industrial motors.

Metal Statistics. — The fourteenth annual edition of the Metal Statistics, 1921, has been published by the American Metal Market and Daily Iron and Steel Report, 81 Fulton Street, New York City.

Damper Regulator.—A new hydraulically operated damper regulator for boiler pressure up to 250 lb. has recently been developed by the Atlas Valve Company, 282 South Street, Newark, N. J.

Electric Locomotives.—Westinghouse Electric & Manufacturing Company has issued a pamphlet on the electrification of the N. Y., N. H. & H. R. R., with especial reference to the road's six latest electric locomotives which are described.

Transmission Towers. — Archbold-Brady Company, Syracuse, N. Y., has published a booklet illustrating and describing the transmission lines of the Niagara Falls Power Company constructed by it, which involved some special engineering problems.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, April 16, 1921 *Number* 16

A Franchise Is Not Always a Contract

THE decision just rendered by the United States Supreme Court in the case of the San Antonio Public Service Company should help materially to clarify the situation in regard to the power of cities in Texas over the rates of fare of the local railway companies. The full printed decision of the court is not available at the present time, but digests received from Washington indicate some of the facts. Briefly, it might be said that the court affirmed a decree of the Texas District Court enjoining the city of San Antonio from requiring the company to carry passengers for 5 cents, with universal transfers, as called for in the company's franchise.

In its decision the court analyzes the franchise of the company and the conditions under which it was granted and whether the two parties thereto had the independent status which would bind each, and it finds that this is not the case with the city, because of a provision existing in the State constitution at the time that the franchise was granted prohibiting any city from making "any irrevocable or uncontrollable grants of special privileges, etc." In these circumstances the court, as in previous cases of a similar kind which have come before it, declared the company was not bound by the rates specified in the franchise but could charge a reasonable rate.

It is difficult to determine the effect which the decision will have on rate cases elsewhere, but at least it seems to sustain the idea of the dependency of the city on the State for power to make franchise contracts with public utility companies and also the right of the company to charge a reasonable rate when there is no franchise or when the city does not have the power to enter into an agreement specifying an irrevocable or uncontrollable rate.

How Can the Efficiency of the Shop Personnel Be Increased?

ALL admit that the efficiency of the various working forces required in electric railway maintenance deteriorated to a considerable extent during the war period when labor was at a premium. Those in charge of the work had to take whatever labor they could get and be satisfied with it. If this waste in efficiency could be computed in dollars and cents it would astound most of us, and the bringing back of this efficiency is a result which is needed today perhaps more than anything else.

The efficiency of any body of men depends to a large extent on the manner in which it is directed. A capable and efficient foreman can do much toward increasing the spirit of co-operation and toward toning up the entire working organization. The selection of foremen should not be left to chance, but the most efficient workmen should be trained to fill vacancies whenever they occur. Of course the most capable workmen do not always make the best foremen, but if a promising employee has a chance actually to direct the work in the capacity of acting foreman when it becomes necessary for the regular foreman to be absent, a general idea can be formed as to the man's ability to develop team work and to inspire methods that will produce results.

Another thing that is sure to produce efficiency in an organization is the use of a piecework system. A piecework basis is not easy to establish in electric railway work, but some of the large roads have introduced this in a number of their departments with marked success. A piecework basis is also much easier to establish on a large railway property than on a small one, as there are more operations which are similar occurring continually, and unless there is enough of the same or similar work being done the establishment of a piecework basis is almost impossible. Thus, take the various steps in the dismantling and rewinding of an armature. The work and time necessary for stripping similar armatures is almost identical, and this could be readily placed on a piecework basis, but unless there is enough of this work to keep a man almost continually employed the efficiency resulting from familiarity in doing the same class of work is lost. This is an opportune time for railways to analyze their needs and introduce practices that will produce results.

The American Engineering Standards Committee a Going Concern

THE forthcoming annual report of the American Engineering Standards Committee contains evidence that the organization is functioning, and that it has secured the allegiance of enough national engineering bodies to give ponderable weight to its stamp of approval.

It will be worth a great deal to the country's industries, in the way of conservation of material resources and mental energy, thus to have a clearing house for engineering standards and a co-ordinating force tending to rationalize these standards. Various branches of industry have been struggling, largely alone, to save themselves money and effort through standardization. This is illustrated by the standardization work of the American Electric Railway Engineering Association, which centralizes in its committee on standards. A large part of the work of the several committees of this association has to do with standardization. In spots this overlaps and hence partially duplicates the similar work of other associations. Consequently when the plan and scope of the A. E. S. C. were put before the executive committee of the Engineering Association, a request for enrollment was promptly forwarded to the parent American Association, which in due course enrolled. It now heads the list of members (in alphabetical order), which typographical position it is hoped may be symbolic of a leading part in the Standards Committee activities.

When one considers the vast sums which have been spent in joint committee meetings representing interests which have desired to get together on standardization matters, he cannot but realize that the American Engineering Standards Committee has a real field for its operations. A careful reading of the abstract of the annual report, which is given elsewhere in this issue, will convince even the skeptical that constructive work in this field is actually being done. For its financial support the committee will have to appeal outside of its membership dues, but funds will be forthcoming as soon as the results shall have shown themselves to be immediately or potentially profitable to industry. It is now up to the electric railways and other supporters of the national movement to make use of the results already achieved and to use the committee's facilities to expedite their own standardization plans.

Don't Be Too Mechanical in Rating Men

ON ELECTRIC railway properties, as with all corporations employing large numbers of men, the tendency is toward careful organization of the personnel. This is right and necessary if the best results are to be secured from the large expenditure for labor and administrative talent. On the other hand, system is not good if it is permitted to take the place of that personal contact and human interest which is the basis of first-class organization.

The danger of over-systematization is not only that the relations of men and supervisory officers may become mechanical and hence inefficient, but also that the real qualities of men may not be appreciated. An example of this, which in fact provoked the present comment, came to light recently. It developed that a certain electric railway department head who has now achieved an unusually good reputation for getting things done and done well was formerly employed in an organization in which the men were carefully "card catalogued." This man's record card bore the significant legend, "N. G., Do not rehire." The trouble in this case was simply "too much system." Superficial qualities here apparently had been used as a basis of rating, with the resulting anomalous and false estimate of the real worth of the man, or the wrong label may even have been attached to his record.

The incident just mentioned is quoted to indicate a danger in organization and not to ridicule systems of classification, including those employing the ubiquitous and highly useful card catalog. Not at all! Only the card catalog and the clerical staff behind it cannot be expected to serve as more than mere recorders. They cannot put in the personal touch.

Surface Trunk Lines Make for Speedier Service

IN MOST cities practice has decreed that all routes from the various outlying corners of the city converge at some downtown central point. In order to get the cars through the center of the city with a minimum of delay to the traveling public, through routes are operated connecting the various parts of the city where investigation has proved that there is a large traffic interchange. This plan has developed routes of considerable length. It brings up the question, is there a limit today to the length of urban route that can be operated so as to give adequate service?

Lately much has been said about distributing centers for l.c.l. freight, and this suggests that the idea embodied in the l.c.l center can be applied with advantage to many urban passenger transportation systems, if passengers will pardon the comparison of themselves, for this purpose only, to l.c.l. package freight. This plan has been recommended in several places in the past for handling what might be termed "the neck of the bottle" traffic.

In Cleveland surface trunk line operation has only recently been suggested as a means of improving the transportation facilities to the northeast factory district. At present all routes serving this section vary in length from 9.6 to 10.6 miles and loop at the public square for the return trip. The routes are becoming so long, however, due to periodic extensions, that it is becoming more and more difficult to maintain the proper scheduled speed. The plan calls for trunk lines operating multiple-unit trains to specific distributing points in the heart of the district served. Such operation makes short routes from the distributing points to the outlying residential districts—routes that can be operated with lighter and smaller capacity equipment on headways determinable only by the traffic originating on each outlying route. Trunk line service can then operate on two bases, either with an all-day fixed headway, with the length of trains varying with the traffic demands, or with service of two or three-car multiple-unit trains running on shorter headway during the rush hours.

Motor Trucking Not Yet a Science

THE discussion at the March meeting of the New York Electric Railway Association covering electric freight and express indicates pretty clearly that all is not well when motor trucking is done at less than cost. To get at the facts of the situation one need only mingle a bit with the motor truckers themselves and listen to stories which are related, from cheerlessness only, to the pious hope that steam railroads will continue to seek higher rates for slower service and thus indirectly give the trucks a chance.

In the congestion and embargo days of the war and shortly thereafter motor trucking went through all the mushroomlike growths made so familiar by the passenger jitney. Any man with $500 or so had a dozen salesmen on his doorstep ready to sell him a truck on a year or two years' time and then to guarantee him business to boot. For a time all went well. There was no trouble in getting full loads going and coming and at any price a desperate shipper would pay. Yet long before the present depression, the less experienced motor truckers began to fall by the wayside—this period coming when it was necessary to put the truck through its first overhaul. Then the operator discovered that such a thing as "repairs"—not to name the remoter "depreciation" and "interest on investment"—had to be figured into costs.

Today, with 300,000 idle freight cars and no hurry calls for materials, the best of motor truckers are at their wits' ends. Traffic at their rates has dropped to one-fourth or less of the old days, but the overhead goes on remorselessly.

Where there is a chance for the truck to serve better than the rail the motor trucker by profession, *i.e.*, the common carrier, finds the ground cut from under him by the so-called occupational truckman. For example, a fruit dealer running empty one way will call up shippers and offer to take loads into town for any old price. On his return trip, carrying only his own wares to capacity, he is not interested in soliciting business. There is such an amazing amount of this sort of thing, besides the competition of one-truck operators who are "eating up their trucks," that the only way out is recognized to be the placing of the motor truck on the same basis of regulation as a railway. This is not the place to argue why, but it is safe to say that this desired regulation of motor trucks is one of the logical steps toward placing all freight carriage in a district under one transportation head that can and will find the way to secure the constructive co-ordination instead of the destructive competition of essential transportation media.

He Who Writes Specifications Should Know Materials

IF SPECIFICATIONS for electric railway supplies are to be prepared intelligently the framers thereof must be somewhat expert regarding the materials which they specify. This is particularly true regarding wood, steel, copper, zinc, tin and alloys, insulating material, wood and paint. Even where standard specifications are utilized it is desirable that they be used with full knowledge of the characteristics of the materials involved. Unfortunately for manufacturers and purchasers, the ideal in this direction is not yet reached, and impossible, impracticable or uneconomical designs, dimensions and strengths are frequently demanded by those who write the specifications.

To ameliorate this condition the editors of this paper more than a year ago arranged with Norman Litchfield to prepare a series of articles on electric railway materials, particularly those mentioned above. His experience, both as a railway engineer and an engineer with a car building company, combined with a thorough technical training, gave him an excellent background for this task. His first article appeared in the mechanical and engineering number for Feb. 21, 1920, and the concluding article, on insulating materials, appears this week. Taken as a whole this series forms a notable contribution to the subject covered, because the author has not only gathered together the recommendations of the several engineering associations as to the characteristics of materials and the fundamental data relating thereto, but has blended his own observations and deductions therewith.

Now that the series is complete, the articles should be reviewed by electric railway engineers; they should be recommended for study to ambitious young men in the technical departments; they should be consulted when new specifications are being drawn up or old ones revised; and they should be reread by purchasing agents who are responsible to a considerable degree for the qualities of supplies which are purchased. There is danger that good reference text like this may be examined approvingly but filed away and forgotten. It does not deserve such a fate, nor is it economical for the railways to allow such a fate to overtake it.

What if There Is No Exhibit This Year?

BY THE TIME this line meets the reader's eye, a decision will presumably have been reached and announced by the executive committee of the American Electric Railway Association as to the holding of an exhibit in connection with the annual fall convention. If the decision is favorable, there is no doubt that the supply men will pitch in with a will to make it the best exhibit in the series. If, however, it has been deemed expedient to postpone the exhibit for a year, as many members believe should be done, there will arise a new query, namely, as to the best location for the meeting. A few reflections based on the no-exhibit contingency cannot be considered academic in view of the circumstances.

Going to Atlantic City for conventions has become a habit with many organizations, including the American Electric Railway Association, partly if not largely because the "Million Dollar" Pier there furnishes a unique and well-arranged structure for a combined meeting and exhibit. There are numerous cities which are supplied with excellent hotels, meeting places and exhibit halls, but there is none which can meet the need for a combination of the three to equal Atlantic City.

When an electric railway convention without an exhibit is to be held the pre-eminence of Atlantic City as a meeting place disappears. There are many reasons for going elsewhere, not the least of which is minimizing of traveling expense. There is some point on the map for which the sum total of this item should be a minimum. The mathematically inclined could figure this out, given the necessary data. Everything else being equal, a convention site somewhere near the "center of gravity" would be highly desirable. Then, again, if the meeting place "happened" to be one where a well-arranged railway was the joy of the local populace, an opportunity would be appreciated for getting some good points on construction, operation and maintenance, as was pointed out in an editorial last week. In other words, the system would be an exhibit.

A byproduct of a meeting in an electric railway center would be the impression created therein by the gathering of representative transportation men. Undoubtedly a good convention without exhibits could be held at Atlantic City, but the additional advantages already mentioned possessed by a mid-Western city like Chicago, Indianapolis or Cleveland are worth consideration.

Quotation from the Federal Electric Railways Commission Report

No. 16

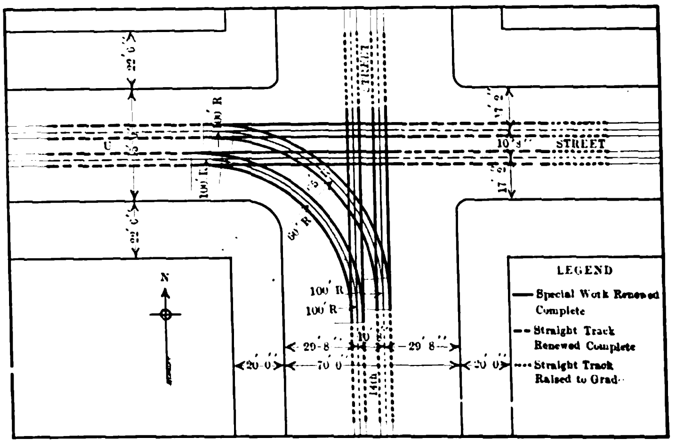
THE original failure of the electric railways to vary their rates of fare for transportation service, based upon the length of the ride, as services in all other lines of business are sold, is, in our judgment, one of the contributing factors to their present financial condition. The electric railway industry is the only public utility which, as an industry, has consistently adhered to a flat basis. Steam and suburban roads charge on a distance basis. Gas, power, electric and water power companies, generally, make their rates upon a measured basis, subject to a minimum charge per month, and the telephone company grades all toll messages on a mileage basis, while observing in most cases a flat rate per month for local service. Whether or not under present conditions it would be to the interest of a community to introduce a zone system of fares, instead of the present flat fare system, is a question which we think should be decided by the community itself, having reference to the social problems involved.

Large Special Trackwork Renewal

The Entire Layout at Fourteenth and U Streets, N. W., Washington, D. C., Was Renewed and Additional Special Work Was Installed by the Capital Traction Company Without Interfering with the Regular Operation — The Surface Work Was Set Up on an Adjacent Lot Before Installation to Insure Rapid Assembling

By E. P. GOUCHER
Assistant Engineer Capital Traction Company, Washington, D. C.

THE Capital Traction Company, Washington, D. C., recently completed a renewal of the entire special trackwork layout at Fourteenth and U Streets, N. W., which, as shown in the accompanying diagram, consists of a double-track crossing and a double-track connected branch-off shown in heavy lines. In addition to the special trackwork, 231.15 feet of single track on U Street was completely rebuilt, as shown by dash lines, and 133 feet of single track on Fourteenth Street and 68 feet on U Street was raised to a new grade, as shown by dotted lines. The entire job was of the underground conduit type of construction used exclusively in Washington.



SPECIAL TRACKWORK RENEWAL IN WASHINGTON, D. C.

This street intersection is one of the busiest in the city as regards traffic, both car and vehicular, especially during the morning and afternoon rush hours. It was therefore of extreme importance that the work be completed as quickly as possible. Every effort was made to this end, and as a result the job was completed, including all paving, in sixty-six working days.

The special trackwork was furnished by the Lorain Steel Company, being fabricated from dimensions and angles obtained by a careful survey of the site. The special surface work is of cast steel throughout, with the exception of a few rolled rails in the connecting curves and tangents. All the wheel frogs are made with renewable cast manganese steel center plates. All the yokes, gussets, etc., composing the substructure are of gray cast iron with machined surfaces to receive the surface work.

The outside curve (the one nearer the crossing) was relocated to give more clearance between cars passing on the curves, the balance of the layout remaining practically the same as the previously existing work. The new material was hauled to a large vacant lot one block from the job, and there the surface work was set up complete in the same relative position in which it was to go in the street, as shown in one of the accompanying photographs. Measurements were taken to permit the cutting of the existing work to suit the new; conductor bars were bent, cut and bonded, and make-up rails were cut and drilled. All make-up rails and compromise plates were numbered to facilitate installation work at night.

The removal of the old concrete and steel substructure on renewal jobs of this type of construction is the most difficult part of the work, especially at such an intersection as that at Fourteenth and U Streets, where the car traffic is very heavy. At the time this job was under way an average of 725 cars passed on the Fourteenth Street tracks, 492 on the U Street tracks and 107 went around the curves during the eight-hour period in which the gangs were working, making a total of 1,324 cars in all directions, or one about every twenty-two seconds. During the rush hours in the morning it was necessary practically to suspend all work on the street. By starting work at 6:30 a.m., however, the evening rush was avoided.

Pneumatic tie tampers equipped with chisel bits were used in removing the old pavement. Holes were then drilled through the paving base and the concrete tube, using pneumatic drills with 1¼-in. bits, and the greater part of the concrete was broken away with bull points and 16-lb. sledges. The concrete remaining on the old yokes and castings was removed with chisel-bit tie tampers. Pneumatic tools operated by efficient labor and in charge of a foreman who understands his job are almost indispensable on work of this kind.

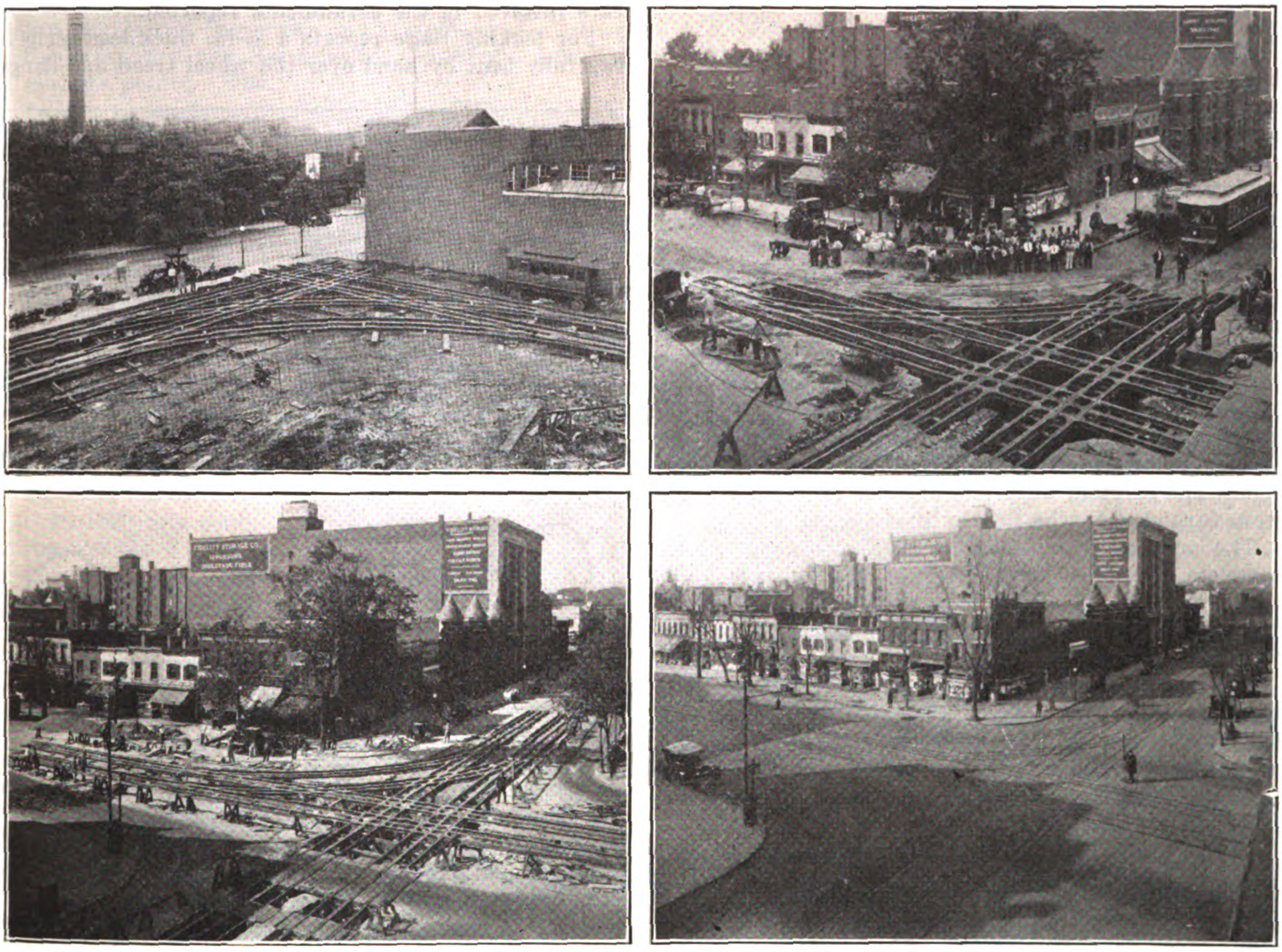
As excavation progressed, vertical 6-in. x 6-in. timbers were placed under the old rails and castings and wedged tightly in place, and as soon as a section was completely excavated and ready for the new special trackwork a concrete slab or "floor" about 6 in. or 8 in. thick was poured so as to clear the bottoms of the deep-

DETAIL COSTS OF LABOR AND MATERIAL

Class of Work	Labor and Hauling	Material	Total
Engineering and superintendence	$648.71	$67.39	$716.10
Excavation	5,814.08	....	5,814.08
Special trackwork	....	42,415.00	42,415.00
Steel work at night	1,625.07	....	1,625.07
All other steel work	2,307.21	1,313.90	3,621.11
Form work	1,460.24	386.53	1,846.77
Concrete tube construction	759.37	1,927.28	2,686.65
Conductor bar	500.49	1,080.94	1,581.43
Paving base	203.63	351.63	555.26
Track drains	276.70	81.05	357.75
Watchmen, tools and sundries	2,681.82	444.09	3,125.91
Paving	452.98	616.94	1,069.92
Raising Fourteenth Street tracks	1,615.55	542.50	2,158.05
Underground obstructions	22.73	72.22	94.95
Gross total cost	$18,368.58	$49,299.47	$67,668.05
Credit from scrap, including cost of handling	132.51	1,703.19	1,570.68
Net total cost of special trackwork	$18,501.09	$47,596.28	$66,097.37
Rebuilding 231.15 ft. on U Street, including raising tracks on U Street	4,883.84	2,625.20	7,509.04
Total cost of entire job	$23,384.93	$50,221.48	$73,606.41

est of the new yokes. This necessitated the complete renewal of some of the old yokes before the placing of the concrete, as many of the old yokes were deeper than the new ones to be installed. Forms about 12 in. square were placed around the bottoms of the supporting timbers. The level pouring of this floor greatly facilitated the setting up of the new yokes during installation work at night and also served as a spread footing under the entire job.

It was necessary to install the new work in three sections. The crossing was installed first, the outside curve, including both branch-offs and both curved crossings, next and the inside curve and branch-offs last. As all our installation work has to be done between 1 and 5 p.m., it may readily be seen that the installation of the outside curve was quite an undertaking for one night. This was necessary, however, because of the relocation of this curve, as mentioned before. But due to the splitting up of the gangs and their distribution over the entire curve no difficulty was experienced and the first car went over on schedule time, three hours and thirty-seven minutes after the removal of the old special trackwork was started. Car traffic was not delayed at any time during the progress of the job, with the exception of two or three minutes' delay due to stopping of cars on cut-outs.



AT TOP, LEFT, SURFACE WORK SET UP ON LOT PRIOR TO INSTALLATION. AT TOP, RIGHT, EXCAVATION IN STREET JUST BEFORE INSTALLATION OF NEW CROSSING. AT BOTTOM, LEFT, NEW SPECIAL TRACKWORK COMPLETELY INSTALLED. AT BOTTOM, RIGHT, ALL WORK COMPLETED, INCLUDING PAVING

Night work was greatly facilitated by the preliminary survey work of the company's engineers. Every yoke and gusset was "tied" out by offset nails in the asphalt street and grade stakes were set on the "floor" of the excavation at the exact elevation of the bottoms of the new yokes. After the old special trackwork had been removed and the "hole" cleaned out, the new yokes were placed in almost their exact locations by means of a chalk line and tape used in connection with the offset nails. They were then wedged up to the grade of the stakes. As the new yokes were of different depths and the floor was level it was necessary in some places to lay pieces of old girder rail on the "floor" upon which to set the new shallow yokes. These rails were placed to the proper grade, so that it was necessary only to set the yokes to line.

The new work, also supported by the 6-in. x 6-in. timbers placed under the wheel rails, was surfaced and lined as quickly as possible after installation, the grades were checked by the District Engineer Department and concrete was poured around the bottoms of the yokes and gussets. This "sticking," as we call it, is to hold the new special trackwork in position while forms are placed for the conduit construction and the concrete conduit is poured. It is one of the most important phases of the work. The entire weight of the new steel and heavily loaded cars must be carried by the timbering and vibration reduced to a minimum, in order to prevent the yokes "working" while this concrete is setting. Several men with hammers and wedges watch the timbering and at the slightest sign of movement in the rails or yokes tighten the wedges at the proper point, or place another upright and wedge it securely in place.

Construction of the formwork for the conduit construction on a renewal job of this kind is a very tedious job, as conditions prevent the standardization of forms to any extent, thus requiring special forms almost entirely. The underground conduit or "tube" construction on the special trackwork only of this job required approximately 233 cu.yd. of 1:2.5:4.5 concrete which cost $8.15 per cubic yard for material and $3.26 for mixing and placing. The forms for this concrete cost on an average of $7.92 per cubic yard of finished concrete, $6.13 of which was for labor. The excessive cost of concrete material as indicated by these figures was due to a cement shortage which occurred at the time this job was under way.

The new paving installed consisted of Durax granite block in the larger areas, with Kreolite wood block in and around the switch and crossing castings. Paving outside the rails was Scoria block laid as headers, with sheet asphalt outside. A total of 680 sq.yd. of new paving was installed. All the block paving was laid on a 1:4 cement and sand cushion 1 in. thick, with pitch as a filler.

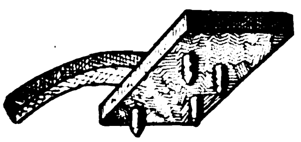
This special trackwork layout was originally installed complete in 1899. In 1910 it was necessary to renew the surface work only of the double-track crossing, but the balance of the surface work and all of the substructure removed in 1920 was part of the original installation, which had been in service under heavy traffic for about twenty-one years. This is rather a long life for special trackwork of this underground type of construction. The original work and also the crossing renewal were furnished by the Lorain Steel Company.

The original installation in 1899 cost about $9,020 complete, $6,100 of this being the cost of the special trackwork only. The surface renewal of the crossing in 1910 cost about $4,058, of which about $3,200 was for the special trackwork.

The accompanying summary shown on the preceding page gives the costs of the 1920 renewal complete by labor and material on the different classes of work for a total length rebuilt in the special trackwork of 535.23 ft. single track.

Cant Hook for Concrete Poles

THE ordinary cant hook used for wooden poles is not only decidedly unhandy on concrete ones but also is even dangerous to use. The single prong often chips out a large piece and has occasionally caused the ruin of a new pole. To obviate this disadvantage, according to an article published in the January bulletin of the Utilities Mutual Protection Company, a new type of hook with a special foot has been developed. This has four teeth set into the face plate in the manner shown in the accompanying cut. By increasing the points of contact and extending the strain on the concrete over a distance of about 6 in., this device will handle even the softest "green" pole without damage and without risk of dropping the concrete pole unexpectedly.



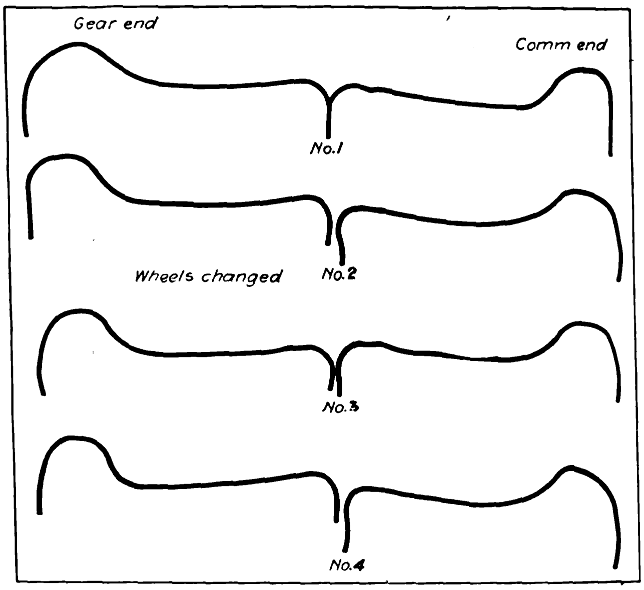
STUDDED FACE PLATE FOR A CANT HOOK

The hook is the invention of Mr. Jennyjohn of the Rochester Gas & Electric Corporation.

Testing Wheels for Flange Contour

A CAREFUL check-up on all cars involved in derailments on the Chicago Surface Lines has been inaugurated by H. H. Adams, superintendent of equipment, with a very good result as to the number of such causes of delay. Whenever a derailment occurs the car crew reports the incident to the company switchboard operator and a daily report of all such derailments occurring over the entire system and giving the time, place, nature of the accident, etc., is made up and copies sent to the track, transportation and equipment departments. The carhouse foremen are called from the equipment superintendent's office each day and asked to report on the condition of the wheels on any cars involved in the derailments reported.

For making these reports a $\frac{1}{16}$-in. thick lead strip is carefully bent by hand over the wheel tread and flange in order to get the exact shape of the contour and determine if any of the car wheels were responsible for the derailment. After one of the lead strips is formed over each wheel the eight strips are inked from an ordinary pad and stamped on the report sheet, whereby the contour of each of these wheels is accurately reproduced. If any bad wheels are indicated the foreman notes on the report what he is going to do, if anything, and forwards the report to the main office of the equipment department, through the division master mechanic. If the foreman has not ordered a proper or adequate repair he receives instructions from his superiors. The foreman also inspects the center and side bearings while he is getting the wheel contours and reports on these.



INSPECTION REPORT OF WHEEL CONTOUR ON CAR REPORTED DERAILED

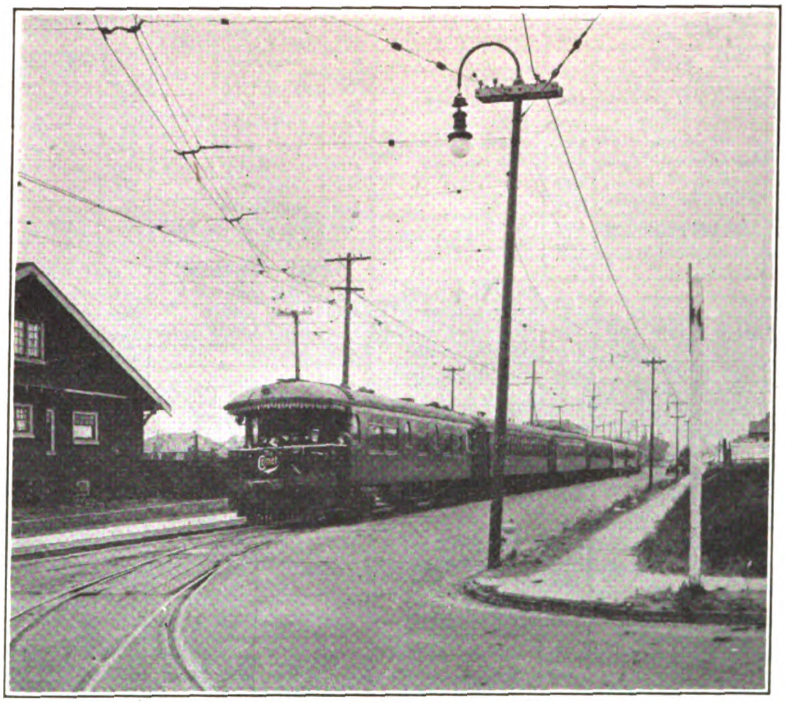
A further step taken in minimizing the derailments was the plotting on a large map of the city the location as reported of all derailments. If these occur in clusters, this fact shows up at once and a special investigation of the situation there follows. Division and system curves showing the number of derailments are also now being maintained, and since the new scheme of inspection was started derailments show a decided downward trend. The moral effect of this follow-up is that the foremen are induced to keep a more careful watch of the wheels on the cars under their jurisdiction in order to avoid the recording of bad wheel accidents against them.

Maintenance Cost Accounting

System Used by San Francisco-Sacramento Railroad Has Proved Invaluable as Means of Supplying Actual Cost Data from Which to Decide Whether Maintenance of Various Parts of Equipment Is Satisfactorily Carried On in Relation to Road Performance

BY E. A. PALMER
Manager Railway Division San Francisco Office, Westinghouse Electric & Manufacturing Company

THE "Sacramento Short Line," formerly known as the Oakland, Antioch & Eastern Railway, operates a heavy traction, high-speed, 1,200-volt, direct-current electric passenger and freight service between San Francisco and Sacramento, California, and intermediate points. The rolling equipment comprises twenty passenger motor cars, weighing approximately 46 tons each, equipped with four Westinghouse 120-hp., 600-1,200-volt motors and type HL multiple-unit control, also six locomotives used mostly in freight service and a number of passenger trailers and standard box cars.*


TYPICAL TRAIN OF SAN FRANCISCO-SACRAMENTO RAILROAD

In 1920 this equipment made 1,616,316 passenger car-miles on the 117.2 miles of track with a total of twenty-six delays, averaging 25.7 minutes, from all causes chargeable to the rolling equipment department. This is at the average rate of 62,166 car-miles of service per detention. The distance between terminals, namely, 90 miles, or 164 train-miles per round trip, from the shop in Oakland, necessitates the highest standard of equipment maintenance possible.

A typical train pulling out of the Oakland station is shown in the headpiece of this article. The schedule speed at which these trains operate is approximately 30 miles an hour, including all stops and slow-downs.

Having in mind the service conditions and the management's requirement that superior time-table performance of equipment, combined with comfort and safety, be furnished the traveling public at a minimum expense, Frank A. Miller, superintendent of power and equipment, undertook in 1914 to install a cost accounting system that would fulfill the following conditions:

1. Conform to the requirements of the Interstate Commerce Commission.

2. Be acceptable to the auditing department of the railroad by accounting for all money disbursed.

3. Furnish accurate segregated cost data for the analysis of the performance of any desired part of equipment for any day, month or year.

4. Totalize the amounts spent progressively either on payroll or material account from the first of each month so that clerical work would not be greatly increased as a whole or at the end of the month.

The system as now in effect, in addition to fulfilling the requirements, has been invaluable as a means of supplying actual cost data with which to decide whether the maintenance of various parts of the equipment is being satisfactorily carried on in relation to the road performance. The basis of segregation of all charges for labor and material which are expended in equipment maintenance is a blueprint schedule entitled "Shop Order Numbers," as shown. The list contains fifty-three main headings, which in turn are itemized into the details upon which specific costs are desired. Each item is given a Shop Order Number, the first two digits of which correspond to the Interstate Commerce Commission account, to which the expense is chargeable. The last two digits give the index to the subaccount. This chart has three features which should be noted:

1. There is a "Shop Order Number" on the chart to which every dollar spent on the annual maintenance budget may be segregated.

2. There are no non-specific "Miscellaneous" Shop Order Numbers to which it is possible to charge expenditures otherwise apparently unaccounted for on the chart. The account numbers under the "Miscellaneous" headings cover definite items on which costs are desired such as —"1,301, Repair to Underpass Pump" or "7,804, Repair to County Tunnel Lights."

3. There are no car or car series numbers on the chart. Costs are kept by parts and types of equipment and the various operations on the same.

A framed copy of the "Shop Order Number" chart is kept in each of the departments of the shop and the

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*The characteristics of the Oakland, Antioch & Eastern Railway's cars and equipment were described in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 11, 1913.

SHOP ORDER NUMBERS

PASSENGER CAR BODY	
3001	couplers
3002	Pilots
3003	Doors
3004	Seats
3005	Glass
3006	Gongs & signal Bells
3007	sanders
3008	spring buffers
3009	safety chains
3010	main body work
3011	sash
3012	window guards
3013	Grab handles
3014	running boards
3015	steps
3016	ventilators
3017	identification boxes
3018	water tanks
3019	car curtains
3020	Roofs
3021	Flooring
3022	Toilets
7007	insp of safety appliances

OTHER BODY EQUIPMENT	
6718	Registers-repairs only
6719	cup vendors "
6720	Foot stools "
6721	Fire extinguishers "
6722	marker lamps "
6723	oil lamps "
6724	signal cases "
3023	Emergency tool boxes "
3024	Trolley catchers "
7008	gen'l insp car bodies

LIGHTING & WIRING	
3025	headlights
3026	headlight wiring
3027	heaters & heater circuits
3028	lights & light circuits
3029	Air wiring
3030	Fan & fan wiring
3076	heat regulators

AIR BRAKES PASS. CARS	
3031	hand brakes
3032	Train stops
3033	" application valve
3034	air hose
3035	brake valves
3036	triple valves
3037	double check valves
3038	Feed valves
3039	Air piping
3040	Governors
3041	double cut out cocks
3042	Angle cocks
7003	inspection of air equip.

SIGNAL EQUIPMENT	
3043	signal reducing valves
3044	signal valves
3045	signal whistle valves
3046	whistles

TRUCK REPAIRS PASS. CARS	
3047	spring hangers
3048	brake rigging
3049	Turning wheels
3050	changing wheels
3051	Journal brasses
3052	changing brake shoes
3053	truck frames
3054	Journal boxes
3055	bolsters
3056	springs
3057	Equalizing bars
3058	axles
3073	Gr[illegible] Davis Wheels

DYNAMOTORS	
3059	dynamotor wiring
3060	" brushholders
3061	" resistance

DYNAMOTORS Y.E.3	
3062	changing armatures
3063	Rep. & rewind armatures
3064	changing fields
3065	Rep. & rewind fields

DYNAMOTOR C.D.M.13	
3066	changing armatures
3067	Rep & rewind armatures
3068	changing fields
3069	Rep & rewind fields

COMPRESSORS D 2 L	
3070	Repairs to compressor

COMPRESSORS C.P.29	
3071	Repairs to compressor

MISCELLANEOUS	
3072	car painting
7001	labor-car cleaning
6701	material- "
7002	labor-car oiling
6702	material- "
6703	Lamps
6704	Drinking cups
6705	Toilet paper
6706	Trolley rope
6707	Register cord
6708	Signal cord
6709	Register rolls
6710	motor carbons.
6711	Dynamotor carbons
6712	headlight carbons
6713	lamp chimneys
6714	oil for lamps & markers
6715	soda & acid for Extinguishers
6716	inspector's Lanterns
6717	other miscel. supplies
6725	miscl. repairs body equip

REPAIRS TO FREIGHT CARS	
3101	Ballast cars body
3102	Box car body
3103	Flat car body
3104	Cabooses body
3105	Trucks
3106	changing wheels
3107	Turning wheels
3108	brake shoes
3109	journal brasses
3110	couplers
3111	Brake rigging
3112	Air hose
3113	hand brakes
3114	Painting
3115	Repairs to foreign cars
3116	insp freight equipm't
3117	cleaning & testing air
3118	Repacking & Oiling

SERVICE CARS	
3201	Brown hoists
3202	Tower cars
3203	Tenders
3204	steam shovels

COLLECTORS PASS. CARS	
3301	Pantographs
3302	Trolley wheel
3303	Trolley bases
3340	" Poles

WIRING PASSENGER CARS	
3304	main wiring
3305	control wiring

CONTROL EQUIP PASS. CARS	
3306	controllers
3307	control resistance
3308	operating switch
3309	control coupler socket
3310	control jumper
3311	bussline jumper
3312	bussline receptacle
3313	Electric brake
3075	Control Change Over

MAIN APPARATUS	
3314	circuit breakers
3315	Reversers
3316	Resistance
3317	switch groups
3318	change over switch

MOTORS	
3319	Brush holders.
3320	motor leads
3321	Armature bearings
3322	motor bearings
3323	Gear cases
3324	Pinions
3325	Gears
3326	motor cases

MOTORS G.E. 205	
3327	changing armatures
3328	rep & rewind armatures
3329	changing fields
3330	rep & rewind fields.

MOTORS WEST. 321	
3331	changing armatures.
3332	rep. & rewind armatures
3333	changing fields
3334	rep & rewind fields

MOTORS WEST. 322.	
3335	changing armatures
3336	rep & rewind armatures
3337	changing fields
3338	rep & rewind. fields

MISCELLANEOUS	
3339	miscel's elect. repairs
7004	inspect. elect. equipm't

BODY LOCOMOTIVES	
3401	couplers
3402	Pilots
3403	Doors
3404	Glass
3405	Gongs & signal Bells
3406	sanders
3407	safety chains
3408	main body work
3409	identification boxes
3410	steps
3411	Roofs
3412	Floors

OTHER BODY EQUIPMENT	
3413	Emergency tool boxes

LIGHTING & WIRING	
3414	headlights
3415	h'dl't wiring & res [illegible]
3416	heaters & heater circuits
3417	lights & light circuits
3418	Air wiring

AIR BRAKES LOCOMOTIVES	
3419	hand brakes
3420	Air piping
3421	Air hose
3422	Brake valves
3423	Feed valves
3424	distributing valves
3425	Governors
3426	Angle cocks
7005	insp of air equipment

SIGNAL EQUIPMENT	
3427	signal red. valves
3428	signal valves
3429	signal whistle valves
3430	whistles

TRUCK REPAIRS LOCO'S	
3431	spring hangers
3432	brake rigging
3433	Turning wheels
3434	changing wheels
3435	changing brake shoes
3436	journal brasses
3437	truck frames
3438	journal boxes
3439	Bolsters
3440	springs
3441	Equalizing bars

DYNAMOTOR LOCO'S	
3442	dynamotor brush h'ld'rs
3443	" resistance
3444	" wiring

DYNAMOTORS Y.E.3	
3445	changing armatures
3446	rep & rewind armatures
3447	changing fields
3448	rep. & rewind fields

DYNAMOTORS Y.E.4.	
3449	changing armatures
3450	rep & rewind armatures
3451	changing fields
3452	rep. & rewind. fields

DYNAMOTORS C.D.M.13	
3453	changing armatures
3454	rep & rewind armatures
3455	changing fields
3456	rep & rewind fields

COMPRESSORS D.2 L.	
3457	repair compressors

COMPRESSORS D.3.L	
3458	repair compressors

COMPRESSORS C.P.29.	
3459	repair compressors

MISCELLANEOUS	
3460	painting locomotives

COLLECTORS LOCOMOTIVES	
3461	pantographs
3462	trolley wheels & poles
3463	trolley bases

WIRING LOCOMOTIVES	
3464	main wiring
3465	control wiring

CONTROL EQUIPMENT	
3466	controllers
3467	control resistance
3468	operating switch
3469	control coupler socket
3470	control jumpers
3471	buss-line receptacle
3472	bussline jumpers

MAIN APPARATUS LOCO'S	
3473	circuit breakers
3474	reversers
3475	resistance
3476	switch groups
3477	change over switch

MOTORS - LOCOMOTIVES	
3478	brush holders
3479	motor leads
3480	armature bearings
3481	motor bearings
3482	Gear cases
3483	motor cases
3484	Gears
3485	Pinions

MOTORS WEST. 321	
3486	changing armatures
3487	rep. & rewind armatures
3488	changing fields
3489	rep & rewind fields

MOTORS 308 B.6.	
3490	changing armatures
3491	rep. & rewind. armatures
3492	changing fields
3493	rep. & rewind fields

MOTORS 308 D.7	
3494	changing armatures
3495	rep & rewind armatures
3496	changing fields
3497	rep & rewind fields

MISCELLANEOUS	
3498	miscel. elect. repairs
7006	insp. of elect. equipm't

SUB-STATIONS	
4801	sub-stations general
4802	repairs-tunnel sub-sta
4803	" Concord "
4804	" Drawbridge "
4805	" Dozier "
4806	" Lisbon "

CROSSING SIGNALS	
1601	m'tce crossing signals
1602	repairs to
1603	" relays · res & loco.
1604	" other wiring
1605	" trolley contacts
1606	Painting crossing signals & poles

AUTOMATIC SIGNALS	
7203	m'tce block signals
1702	repairs to relays
1703	" relay wiring
1704	" other wiring
1705	" imp. bonds & wiring
1706	" switch boxes
1707	" trans & H.T. fuses
1708	" signals-heads-poles &
1709	" insulated joints
1710	Painting poles & signals
2211	repairs to bonding
1512	bridge circuit controller

TELEPHONES	
1801	m'tce telephone system
1802	repairs to instruments
1803	" line
1804	" submarine cable
1805	miscellaneous repairs

INTERLOCKING	
7201	operation of tower
7202	m'tce interlocking plant
1720	rep. to relays & indicators
1721	" tower wiring & switchboard
1722	" derails & switches
1723	" signals
1724	" interlocking machine
1725	" track circuits
1726	" air lines
1727	" compressor & motors
1728	" storage batter.
1729	" insulated joints
1730	painting signals & poles
2214	repairs to track [illegible]

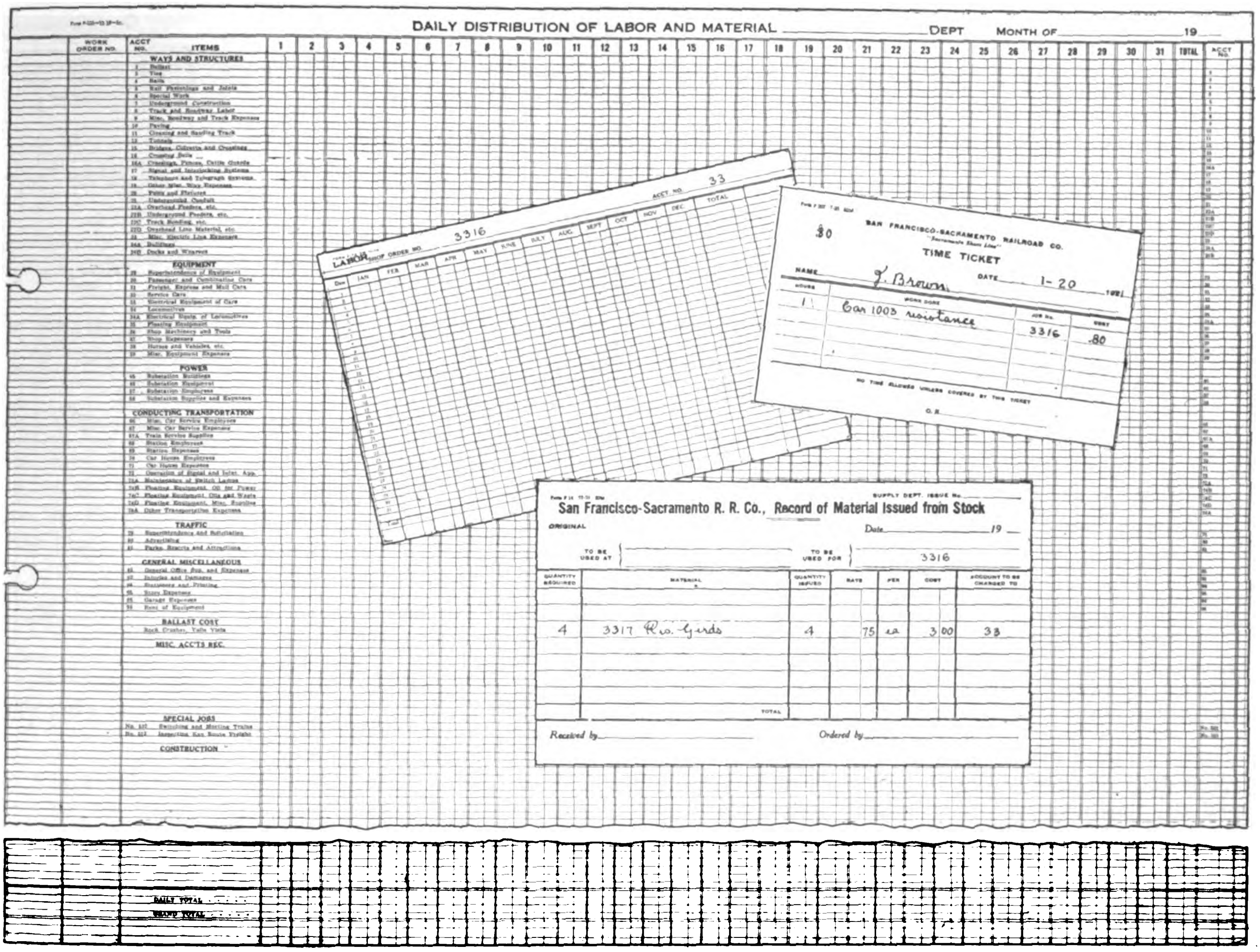
SHOP EXPENSE	
3601	shop tools & machinery
3602	cleaning shop
3603	lighting shop
3604	heating shop
3605	small hand tools
3606	other miscel. shop expense

AUTOMOBILES	
3801	repairs to automobiles
9601	gas, oil & etc for autos

MISCELLANEOUS	
901	repairs · roadway tools
902	" track speeders [illegible]
2403	" ferry slips
3504	" ferry boat
7801	m'tce shelter Ave. arcs.
7802	repairs to " "
7803	" sacramento " "
7804	" county tunnel lights
1301	" Underpass Pump

Revised 7-1920

E.D. 114


DAILY DISTRIBUTION OF LABOR AND MATERIAL ________ DEPT MONTH OF ________ 19__

WORK ORDER NO. | ACCT NO. | ITEMS

WAYS AND STRUCTURES

EQUIPMENT

POWER

CONDUCTING TRANSPORTATION

TRAFFIC

GENERAL MISCELLANEOUS

BALLAST COST

MISC. ACCT'S REC.

SPECIAL JOBS

CONSTRUCTION

DAILY TOTAL

GRAND TOTAL

LABOR — SHOP ORDER NO. 3316 — ACCT. NO. 33

JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC TOTAL

.80

SAN FRANCISCO-SACRAMENTO RAILROAD CO.
"Sacramento Short Line"
TIME TICKET

NAME J. Brown DATE 1-20 1921

HOURS	WORK DONE	JOB No.	COST
1	Car 1003 resistance	3316	.80

NO TIME ALLOWED UNLESS COVERED BY THIS TICKET

O. K. ________

SUPPLY DEPT. ISSUE No. ________

San Francisco-Sacramento R. R. Co., Record of Material Issued from Stock

ORIGINAL

Date ________ 19__

TO BE USED AT ________ TO BE USED FOR 3316

QUANTITY REQUIRED	MATERIAL	QUANTITY ISSUED	RATE	PER	COST	ACCOUNT TO BE CHARGED TO
4	3317 Res. Grids	4	75	ea	3 00	33
	TOTAL					

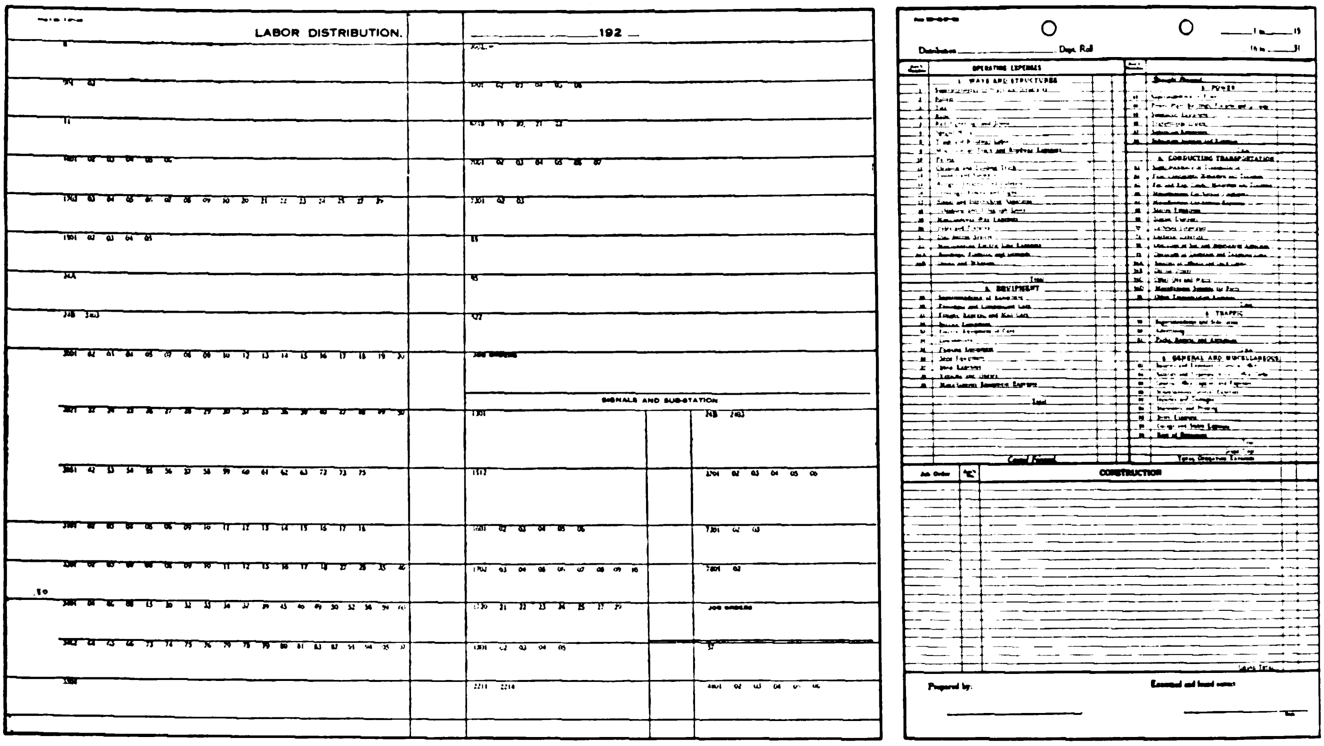
Received by ________ Ordered by ________

LARGE FORM, BASIS FOR SEGREGATION OF ALL LABOR AND MATERIAL CHARGES. INSERT, AT LEFT, LABOR DISTRIBUTION FORM MADE UP FROM TIME SLIPS. AT RIGHT, TIME SLIP USED BY SHOPMEN. BOTTOM, MATERIAL RECORD CORRESPONDING TO TIME SLIP

foremen handling work are held responsible to see that the men in making out their time slips are charging the correct shop order number. In another illustration is displayed the form of time slip used. Such slips are made out and turned in daily to the foremen, who approve and forward them to the mechanical department office not later than 10 o'clock the following morning. The slips are then extended by the clerk according to the men's rates, not less than one hour being charged to any Shop Order Number, and the amounts are distributed on the daily "Labor Distribution" form shown on this page. This develops the total amount

TABLE I—MAINTENANCE OF PASSENGER EQUIPMENT, 1920, SAN FRANCISCO-SACRAMENTO RAILROAD

Item	Labor	Material	Total	Per Cent of Sub-Total	
Control Equipment (Details)					
Controllers (master)	$81.14	$53.00	$134.14	14.7	
Control resistance	22.57	15.50	38.07	4.2	
Operating switches	2.04	.85	2.89	0.3	
Control coupler sockets	24.31	12.25	36.56	4.0	
Control jumper	87.05	60.49	147.54	16.2	
Busline jumper	133.87	264.37	398.24	42.8	
Busline receptacle	78.58	40.28	118.86	13.1	
Electric brakes	2.91	0.09	3.00	0.3	
Control changeover	18.23	16.13	34.36	3.8	
Total	$450.70	$462.96	$913.66		
Per car-mile					$0.00057
Control Equipment (Main apparatus)					
Circuit breakers	19.89	19.69	39.58	1.6	
Reversers	159.32	145.01	304.33	12.1	
Resistance	182.27	443.45	625.72	25.0	
Switch groups	787.48	506.47	1,293.95	51.7	
Changeover switches	144.99	74.06	219.05	9.0	
Total	$1,293.95	$1,188.68	$2,482.63		
Per car-mile					$0.00155
Collectors					
Pantographs	856.90	201.99	1,058.89	33.6	
Trolley wheels	504.86	974.52	1,479.38	47.1	
Trolley bases	37.15	58.56	95.71	3.0	
Trolley poles	358.18	249.96	508.14	16.3	
Total	$1,657.09	$1,485.03	$3,142.12		
Per car-mile					$0.00196
Motor (Details)					
Brushholders	$145.06	$145.57	$290.63	7.8	
Motor leads	103.30	238.97	342.27	9.2	
Armature bearings	78.36	454.49	432.85	14.4	
Motor bearings	173.30	753.97	927.27	25.0	
Gear cases	33.26	13.43	46.69	1.3	
Pinions	24.71	495.56	520.27	14.1	
Gears	108.86	765.28	874.14	23.6	
Motor cases	48.50	104.73	153.23	4.1	
Total	$715.35	$2,972.00	$3,687.35		
Per car-mile					$0.0023
Wiring					
Main wiring	108.63	161.79	270.42	51.8	
Control wiring	157.81	93.20	251.01	48.2	
Total	266.44	254.99	521.43		
Per car-mile					$0.0003
Motors West 322					
Changing armatures	329.73	.63	330.36	18.2	
Repairing and rewinding armatures	333.75	770.43	1,104.18	60.8	
Changing fields	77.36	50.70	128.06	7.0	
Repairing and rewinding fields	197.30	52.34	249.62	14.0	
Total	$938.14	$874.10	$1,812.24		
Per car-mile					$0.00113
Grand total	$5,321.67	$7,237.76	$12,559.43		
Per car-mile					$0.00778


LABOR DISTRIBUTION.
192
SIGNALS AND SUB-STATION
OPERATING EXPENSES
EQUIPMENT
TRAFFIC
CONSTRUCTION
Prepared by:

AT LEFT, FORM USED TO RECORD LABOR EXPENSE CHARGEABLE TO I. C. C. ACCOUNTS. AT RIGHT, ALL AMOUNTS FOR LABOR ON INDIVIDUAL SHOP ORDER RECORDED ON THIS CARD

spent daily on each of the Shop Order Number accounts and also the Interstate Commerce Commission accounts. These must balance daily with the payroll amount. The amount for each Shop Order Number daily on account of labor is entered up progressively from the first of each month on a 5-in. x 8-in. card having space for each day in the year. There is one "Labor" and one "Material" card for each Shop Order Number of the form shown as an insert on page 717. The material card record is handled the same way through the entering up of the storeroom requisitions, charged to the proper Shop Order Number daily. From these cards progressive records are available of the amounts spent on each account for either labor or material. From the daily labor distribution sheet, which is filed with the time cards after the payroll has been made out, the amounts of labor expense chargeable daily to the Interstate Commerce Commission accounts are entered up on another form, shown at the top of this page. This is carried forward to the end of the month progressively so that the total figure charged to each account appears on the last day of the month. The purchasing and stores department handles the material account in the same way. At the end of the month the form shown on page 717, giving distribution of mechanical and power department payroll by the Interstate Commerce Commission accounts, is filled in and forwarded to the auditor.

Throughout the year special items such as trolley wheels, brake shoes, lubrication, wheels, etc., are taken from the Shop Order Number cards and the cost per 1,000 car-miles for each month computed for plotting in a curve book.

At the end of the year all of the data from the cards are totalized and tabulated into an annual report, with relative per cents of the total and cost per car-mile for the fifty-three main items. In the report are included the operating record of the equipment, changes made, extraordinary worth, etc., as well as the detailed cause of all delays.

The cost of maintaining electrical equipment on passenger cars for the year 1920 is given in Table I. This represents two pages out of the forty-two-page report and will serve to illustrate the methods of keeping and tabulating the various costs.

In Table II will be found rolling equipment performance data for the years 1915 to 1920 inclusive, also electrical equipment maintenance costs for the same period of time. The latter shows the effect of war-time wages and material during the past three years on delays to service and cost per 1,000 car-miles.

This system gives very complete data and is applicable to any electric railway or electrification where accurate detailed costs are desired. It serves as a check on the cost of maintenance and alleviates numerous troubles by indicating the cause, thus permitting a slight change in equipment or operating conditions. The writer has attempted merely to outline the method that has been used very successfully by F. A. Miller, superintendent of power and equipment of the San Francisco-Sacramento Railroad.

Table II—ROLLING EQUIPMENT PERFORMANCE DATA

Year	1915	1916	1917	1918	1919	1920
Passenger Equipment						
Total mileage including trailers	1,562,264	1,435,183	1,569,075	1,429,346	1,556,932	1,616,316
Total number delays—all causes	37	35	37	43	25	26
Total minutes delay	806	736	1,118	1,625	562	668
Average length delay minutes	21.7	21	30.2	37.8	22.4	25.7
Car-miles per delay	42,223.3	41,005.2	42,677.0	33,240.0	2,277.0	62,166.0
Number delays per 1,000 car-miles	0.023	0.024	0.0234	0.03009	0.016	0.0163
Minutes delay per 1,000 car-miles	0.516	0.513	0.707	1.1371	0.361	0.4182
Electrical maintenance cost per 1,000 car-miles	$3.13	$5.35	$4.45	$8.07	$6.37	$7.78

Electrical Insulating Materials*

The Most Essential Characteristics of Insulating Materials Are High Dielectric Strength and Ohmic Resistance, but Ability to Withstand Considerable Mechanical Stress and Heat Is Also Desirable

BY NORMAN LITCHFIELD

THE old analogy of electricity to water under pressure, flowing through a pipe, while not scientifically accurate, has served well to give a general idea of some electrical functions and properties, and may equally well be used to show the relation between electric current, the conductor and the insulator, the first being analogous to the fluid, the second to the bore of the pipe and the third to the walls of the pipe. It is with the last named that we are concerned in this article, and an attempt will be made to sketch the nature and properties of some insulating materials which are in general use in the electric railway field. The insulator, like the pipe walls in the conduction of water, must prevent the electricity from bursting violently through so that it is all lost, before arriving at its proper destination, and it must not permit small quantities to ooze through, thus losing in the aggregate a considerable amount. If the former occurs, we have what is designated a "short" circuit, because the electricity has taken a short path back to the source of supply, without traversing the long path through the working machine as intended.

Furthermore the insulating materials must continue to fulfill these functions over reasonably long periods, despite the adverse and deteriorating conditions to which it is naturally subjected in its place of use.

The ability of the material to resist the tendency of the electricity to burst through is known as the dielectric strength; that preventing leakage is the ohmic resistance.

Again, just as water is conducted through pipes of iron, wood, stone, concrete, glass, brass, copper, rubber, etc., depending on some particular mechanical quality of the conducting substance, so it has been found by long and costly experimentation that certain insulating materials possess particular electrical, mechanical and other qualities which render them more suitable for use under some specific set of circumstances than others. The chief of these characteristics are the following: (1) Dielectric strength, (2) ohmic resistance, (3) tensile strength, (4) resistance to abrasion, (5) flexibility, (6) stability under heat, (7) stability under moisture, (8) stability under vibration, (9) ability to be molded into a given shape, (10) ability to take high surface polish, (11) ability to withstand climatic conditions, (12) fireproof qualities, (13) resistance to electric arc, (14) cost.

For general use rubber has proved to be the material most generally adaptable. In fact, rubber may be said to go hand in hand, as it were, with copper in differentiating the electrical industry from other industries. Copper's influence was already mentioned by the writer in a recent article in the ELECTRIC RAILWAY JOURNAL on the nature and uses of that metal. Copper as a conductor and rubber as an insulator, together with iron as the magnetic material, form the material backbone of the electrical industry. It is interesting to note that the name "rubber" as applied to caoutchouc is a purely colloquial one, the origin being the suggestion of the English chemist Priestly, toward the end of the eighteenth century, that caoutchouc was useful for "rubbing out" pencil marks. It was immediately used for this purpose and became known as "India rubber."

SOFT RUBBER INSULATION FOR WIRES AND CABLES

The basic material of the rubber insulation used in cables, etc., is India rubber, or caoutchouc. This is the milky juice which oozes out and then coagulates when the skin of the plant is punctured. The grade of the rubber varies with the plant and with locality, the highest grade coming from Para, in Brazil, produced by plants of several kinds of that class known to botany as Hevea. This grade is therefore sometimes called Hevea rubber, but its usual designation is Para rubber. It is of course not always necessary to use the highest grade of rubber, but practically all specifications for insulation require a certain percentage of "pure Para rubber."

Rubber in its natural state, as it comes from the plant, becomes hard and stiff when cold, and it is therefore unfit for most commercial purposes in its untreated condition. One of the great epoch-making discoveries in this field was that by Charles Goodyear, in 1844, of the process known as "vulcanizing" rubber. In this process the rubber is mixed with sulphur in a light powdery state (flowers of sulphur) at low heat, and is then "cured" in superheated steam at about 300 deg. Fahr. The whitish natural rubber by this process becomes gray and hornlike, and in this state is but little affected by cold. By variation in the amount of the sulphur and the degree of heat, various different graduations of hardness are obtained up to the hard grade known as hard rubber, vulcanite or ebonite, the varying shades of color being the result of additions of mineral matter and old rubber.

Rubber insulation, even in the best grades, contains but little more than 30 per cent of new rubber. Thus the tentative specifications of the American Society for Testing Materials for insulated wire permit, in addition to new Hevea rubber, "waxy hydrocarbons consisting of ceresin or refined paraffin, sufficient sulphur properly to vulcanize any inorganic mineral matter," the rubber content being from a minimum of 30 per cent to a maximum of 33 per cent.

The amount of rubber in the insulation practically determines its price, 30 per cent and up being the highest commercial grade. Lower percentages are often used, however, it being quite common on car equipment to use 20 or 25 per cent. The equipment committee of the American Electric Railway Engineering Association in 1915 put itself on record as follows: "There can be no question but that 30 per cent pure Para rubber would give the best results, and its use may be advisable in special cases, as where cars are operated in subways, and there is a liability to small short circuits which might cause smoke, fire or a possible panic. However, the wire referred to by manufacturers as containing 20 per cent pure Para rubber is giving general satisfaction and it is felt that 30 per cent makes an insulation probably more expensive than is necessary. Especially does this seem to be the case in view of the fact that car wiring is often removed after a few years, in which event if 30 per cent compound were used the benefit of longer service for the extra expense would not be obtained." The committee then calls attention to the specification for rubber-insulated wire for power distribution purposes given in section Dw8a of the Engineering Manual of the Engineering Association, and gives as its opinion that the specification covers a quality of insulation satisfactory for car equipment purposes.

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*This is the last of a series of seven articles prepared by Mr. Litchfield to bring about better co-operation between users and makers of electric railway equipment. The previous articles appeared in issues of this paper for Feb. 21, 1920, page 366; April 17, 1920; page 803; June 19, 1920, page 1247; July 17, 1920, page 115; November 20, 1920, page 1051, and December 18, 1920, page 1229.

Since the publishing of the above opinion the power distribution committee has revised its specification to Dw8b, which "is the result of a demand for low grades of wire and cable, insulated with Para rubber compound, that can be used for line and equipment purposes," the 30 per cent compound being entitled "Grade A" and the 20 per cent "Grade B." For Grade A, the composition required is the same as that already quoted from the A. S. T. M. tentative specifications, namely, rubber, sulphur, inorganic mineral matter and refined solid paraffin or ceresin.

Both the A. E. R. E. A. Grade A and the A. S. T. M. specifications are the result of the work of the joint rubber insulation committee, a full report of whose work is given in the 1914 Proceedings of the American Institute of Electrical Engineers, which not only laid down the desired composition but also the exact method of analysis, as it was found that with different methods quite widely varying results were obtained from the same material. This method is given in detail in the A. S. T. M. and A. I. E. E. publications, and as it is not of general interest to the user of the insulation will not be quoted further. It may simply be stated that the method finally adopted was that which all agreed would show whether pure Para rubber had been used, and in what amount.

For the Grade B insulation the A. E. R. E. A. specification does not require pure Para rubber, but simply that the insulation shall contain not less than 27 per cent of rubber gum. Five chemical tests are prescribed, namely, acetone extract, alcoholic potash extract, chloroform extract, ash and total sulphur. It is required that the sum total of the results of these five tests shall not exceed 73 per cent by weight of the total compound, the tests to be made in accordance with the Underwriters' Laboratory specification. Obviously the specification for the Grade B material is much less exacting than that for the Grade A.

In passing it may be said that the making of rubber analysis is a difficult matter, requiring the services of an expert chemist. It is, therefore, somewhat expensive and for this reason a chemical analysis is not always resorted to by the user.

For physical properties the A. S. T. M. specification requires the following: Tensile strength, minimum, 1,000 lb. per square inch; set, maximum in 2 in., ⅜ in.; elongation, minimum before rupture, 2 to 9 in.; test specimen to be 2 in. long between bench marks, and to be stretched at the rate of 20 in. per minute until the specimen breaks.

For testing the set, another 2-in. specimen is stretched at the rate of 20 in. per minute until the bench marks are 6 in. apart, and released within another five seconds. The set is determined one minute after the beginning of release. The elongation test is made on the same specimen used for the set test, and after the completion of the latter. It is stretched at the rate of 20 in. per minute until it breaks.

The physical requirements of the A. S. T. M. specification as given above, are somewhat different from those of the A. E. R. E. A. in its specification Dw8b already referred to, which requires as follows: Tensile strength, minimum, 1,000 lb. per square inch; elongation at break, five times original length, or four times original length if specimen is over 12/64 in. thick; elongation five seconds after release when stretched at rate of 12 in. per minute to three times its original length, 20 per cent.

For convenience we may set the equivalent values one against the other, as follows:

	A. S. T. M.	A. E. R. E. A
Original length..............	2 in.	2 in.
Tensile strength..............	1000 lb. per sq. in.	1000 lb. per sq. in.
Rate of stretch for tensile test	20 in. per min.	12 in. per min.
Elongation measured on.....	"set" specimen re-stretched after set test to rupture	"tensile" specimen at rupture
Elongation (times original length)..................	....	5, or 4 if specimen is over 12/64 in. thick
Elongation..................	2 to 9 in.	....
Set in per cent of original length	18¾	20
Set in inches...............	⅜ in.	2/5 in.

It therefore appears that the two sets of requirements are very nearly alike, and it would seem that in the interest of standardization the two specifications should be brought to agree, inasmuch as either one probably insures the desired qualities.

With regard to electrical properties the chief, in addition to chemical and physical features already outlined, are, first, dielectric strength, which is the property of resisting the puncturing of insulation by high voltages, and second, ohmic resistance, which is the property of resistance leakage.

Both of these tests are made after immersion in water for a given period and while the specimen is still submerged. Of the two, the breakdown or dielectric strength test is the more important. It is usually made on the basis of twice the normal voltage plus 1,000 volts. Detailed figures are given in both the specifications already referred to.

It may not be amiss to point out that the purpose of the foregoing tests and requirements is to provide a material that will (1) stand high voltages without puncturing, (2) prevent leakage, (3) bend without cracking, (4) not become hard or otherwise deteriorate with reasonable age, (5) not absorb moisture and (6) withstand reasonable temperatures.

Reference to fireproofing has been omitted for the reason that the application of a fireproof covering has generally the effect of giving a tendency to absorb moisture, thus causing liability to short circuit and thereby to starting fires where no fire existed. Fireproof insulated wire is made and is used successfully in places where the temperature is so high that the ordinary insulation will not stand up. It cannot be exposed directly to moisture.

Much more could be said in relation to methods of manufacture, braid coverings, cotton separators, etc., but these subjects are hardly germane to the purpose of this article, which is simply to give an outline of the nature of the common insulating materials. Emphasis should nevertheless be laid (as the writer has done in connection with other materials) on the skill and integrity of the manufacturer, without which no specification is effective.

COTTON AND PAPER INSULATION FOR WIRES AND CABLES

Small wires, such as are used in small armature and other coils, are quite generally insulated with cotton, either wound on the wire in the form of thread or in woven tubular form. Cotton insulation needs no special comment other than that it is used only where the differences in potential are small. It is often impregnated with some insulating varnish, the nature of which will be discussed later.

For lead-sheathed cable for power distribution purposes the insulation is composed chiefly of paper. A good description is given in the A. E. R. E. A. standard specifications for three-conductor cable, an extract from which follows:

> The cable is to be composed of three copper conductors, each separately covered with paper tape to the required thickness and then twisted together with a suitable lay. The interstices are to be rounded out with jute and the whole wrapped with a paper belt to the required thickness.
>
> The paper, soaked in a suitable insulating compound, is to be covered with a lead sheath of the required thickness. The highest grade of pure manila rope paper tape shall be applied helically and evenly to each of the conductors until the required thickness of paper is obtained.
>
> All moisture shall be expelled from the paper and jute by baking in suitable ovens; they shall then be thoroughly saturated with the insulating compound of the required kind and quality.

This arrangement makes a tough, resistant insulation which bends the conductors tightly, keeping them from shifting and wearing into the insulation.

LINEN AND SILK USED WHERE MECHANICAL STRENGTH IS NECESSARY

Linen and silk are generally used as cloth, treated with linseed oil or some insulating compound. Being of a finer texture and greater mechanical strength than cotton, they are used in places where these qualities warrant the extra expense.

Glass and porcelain are excellent insulators, but have only a limited field on account of lack of mechanical strength. Both are used extensively for line insulators, porcelain being preferable. The latter is also used for commutator brush supports and cores for heater coils. Its chief requisite is that it shall maintain an unbroken surface, as when the glaze becomes cracked dust and dirt and moisture soon accumulate and the insulator breaks down.

Wood, though a fairly good insulator when dry, absorbs moisture readily, and unless used in large masses must be painted or impregnated with some protecting paint or varnish. Familiar uses are line poles, crossarms, pins, trolley stand boards, contact shoe beams, etc.

The use of mica as the separator between the bars of commutators is familiar to all. It is universally employed for this purpose. Chemically it is a crystalline salt of aluminum and potassium or sodium. The crystals easily split up into thin sheets. Its color varies from white to amber, the latter being the softer grade.

Besides being used in its natural state, it is often used in composition with other materials. Thus "mica plate" is made up of small pieces of mica and paper treated with a special binding material and steamed under pressure. Other compounds of mica are micanite, micarta, etc.

The chief uses of mica and its compounds are in places where the temperature is apt to reach a point where other materials would not stand up or where a high degree of insulation must be maintained in very small thicknesses. While the white mica is the better insulator, the amber mica is the softer and is therefore used on commutators which are not slotted and in which the mica must wear down as quickly or more rapidly than the copper itself.

Asbestos, found chiefly in Canada, consists mainly of silicate of magnesia, fibrous in its nature, and capable of being woven if combined with cotton or other material, the fiber of the asbestos being too short to give the necessary strength alone. Its dielectric strength is not great and its chief use as an insulator comes in places where a high temperature or arcing occurs. It is familiar to all in the form of tape, cloth, paper, wallboard and "lumber" or "shingle," the latter being compounds of asbestos and portland cement.

Shellac, which is used as a binder, is a peculiar form of resin, the name being in reality a combination of the two words, shell and lac; that is to say, shellac is a shell-like form of lac. Lac is formed by an insect or parasite that lives on a tropical tree. The female sucks the juice from the tree, digests it and exudes it over herself, finally incrusting herself entirely with it, and lays her eggs in this envelope. In true India fashion she dies therein and her progeny eat her carcass and break their way out through the lac envelope. The twigs of the tree are covered with these envelopes and in this form are known as stick-lac. The lac is rubbed off the twigs and washed in water and in this form is called seed lac. These seeds are placed in cotton bags before a fire and the bags squeezed, the lac dripping out in much the same fashion that the housewife strains fruit juice for jellies. The lac drops on rollers or sticks to which it adheres in a thin shell, hence the name of "shell-lac."

MOLDED INSULATION HAS MANY FORMS

Molded materials derive their names from the fact that they are formed in molds and generally under pressure. They thus can be given practically any form, often with a high surface finish and of accurate dimensions. In many cases the molding process also permits the inclusion of brass inserts which are locked in by the compound around them and which can be tapped for screws, etc. They consist of mixtures, sometimes chemical compounds, of some of the materials already mentioned, rubber, asbestos, mica, fiber, shellac gums, asphaltic compounds and the so-called "synthetic resins." They are composed essentially of a filler and a binder, either of which may be the actual insulator, the other being included to give the desired form and mechanical properties.

Practically all are "trade compounds," the exact nature of which is kept more or less secret, but it is possible to give the reader a general idea of some of the better known materials. Those who are more particularly interested in the detailed chemical analysis will find several books and technical articles in the chemical press, to which they are referred.

The question is sometimes asked as to which is the best insulator among the molded materials, and in answer it may be generally said that that depends on the service to which it is to be put. Sometimes the need for great dielectric strength is paramount, at other times the electric stresses are not excessive, but the part must withstand considerable mechanical stress. At still other times heat is the controlling feature, or moisture may be the determining factor. Various compounds have been developed to meet these particular conditions, it being more or less true that one form of excellence is usually obtained at the expense of other points.

Thus, according to one authority, "compounds using the various grades of shellac as a binder are as a rule of low heat-resisting qualities, and owing to the nature of the filling materials, such as fiber and ground mica, will not take a practically high finish. These same fillers, however, impart to the stock relatively high mechanical and dielectric strength."

On the other hand some of those compounds using rubber as a binder "have relatively low mechanical strength of one sort, but have great strength of another sort, in that they successfully withstand blows and sudden shocks, being slightly elastic; that is to say, not at all brittle. On the other hand, they will not readily take inserts, such as screws and small metal parts. Their flexibility, however, permits them to be readily molded into large heavy shapes, and they are particularly adaptable, owing to their high resisting qualities for such parts as grid resistance frame bolts, fingerboards, division plates, arc chutes, coil and switch boxes. The flexibility also permits this class of material to be used for parts that are bolted or clamped to uneven surfaces of any kind, as, for instance, busbar installations.

In mechanical strength the synthetic resins, such as "Bakelite," stand alone among the molded compounds. Furthermore, they do not absorb moisture and they resist the action of nearly all acids and alkalis and can be used in the presence of oil.

In determining the relative value of the various materials four chief tests are made in the laboratory. The first of these is the dielectric strength test, in which it is customary to immerse the piece in oil, to decrease the surface leakage by increasing the dielectric surrounding the test piece. This permits the piece to be punctured before it arcs over. When the piece is punctured its thickness is measured in thousandths of an inch and the dielectric strength is calculated in volts per mil.

The second test is that for mechanical strength. The tensile strength is determined on a flat piece ½ in. thick and of shape approximating the figure 8, with the use of special clamps in an ordinary tensile test machine. The compressive strength is obtained on a specimen molded in the form of a cube in a hardened steel mold, 1 in. on edge. The transverse strength is determined on a ½-in. square specimen, 5 in. long. The maximum fiber stress is calculated by the formula $\frac{S = 3PL}{2BD^2}$ in which S = maximum fiber stress, P = load applied, L = distance between supports, B = width of specimen and D = depth of specimen.

The third test is that of distortion under heat, in which a test specimen is used for the same size and shape as that used in the transverse test. A special apparatus is used in which the specimen is supported on two steel supports, with a load applied on top of the specimen vertically and midway between the supports. The vessel in which the specimen is placed on these supports is surrounded with oil in another outside vessel. Arrangements are made for raising the temperature of the oil gradually. The machine is so arranged that the deflection of the specimen at the center can be measured on a scale, and is equipped with a thermometer so that the temperature of the specimen can be recorded at any time.

The fourth test is that of the effect of moisture, in which the original weight of the specimen is obtained, the dry weight after heating in an oven for a specified time and the saturated weight after immersion in water for 100 hours. Record is also taken of the percentage of moisture in the specimen as received, and the percentage of moisture absorbed during 100 hours, taking the dry weight as 100 per cent.

In the tensile and compressive test specimens are tested under three different conditions, namely, (1) In condition in which they are received, (2) after heating in an oven for one hour at a temperature 10 deg. C. below the distortion point of the material, as determined by the distortion test, and (3) after being entirely immersed in distilled water for forty-eight hours at normal room temperature.

In the transverse test specimens are tested as received, and also after immersion. Dielectric tests are made of specimens as received, after heating in oven and after having the rim immersed in melted paraffin for a depth of 1 in. and been entirely immersed in distilled water.

Further details of the tests will be found in "Tentative Tests for Insulating Materials," published by the American Society for Testing Materials, and from which the above was taken.

MOLDED MICA, ETC., USED FOR OUTDOOR WORK

The mica compounds use shellac as a binder, and often contain a certain amount of asbestos, which by virtue of its fibrous character gives the composition a mechanical strength which the mica alone does not possess. All of the materials being weatherproof, this composition lends itself to outdoor work.

The word "Vulcabeston," while a trade name, has been in use so long as practically to represent compounds of asbestos and rubber which are vulcanized.

"Bakelite" is the name given by Dr. Bakeland, the inventor, to a material made by his patented formula. It is essentially a product of the modern chemist, it being what is known as a synthetic resin; that is to say, a resin not found in nature, but one put together from certain definite materials according to a special process. The chemist tells us that it is a compound of formaldehyde and phenol, which admittedly does not convey much information to any one but a chemist. Suffice it to say that they are both organic compounds (not mineral) and are constituents of coal tar, that marvelous substance which results from heating coal with insufficient air and from which have sprung the extraordinary series of aniline dyes, perfumes, medicines, high explosives, etc., with which the modern chemist has astonished the world. These two compounds when properly treated combine to form the remarkable transparent substance "Bakelite," with which we have all become familiar in the form of pipe stems, fountain pens and toilet articles. In molded insulations it is used as a binder with wood or asbestos as a filler and is colored with various dyes.

PHYSICAL AND ELECTRICAL PROPERTIES

According to the authority already quoted, the dielectric strength and other properties of various compositions are as follows:

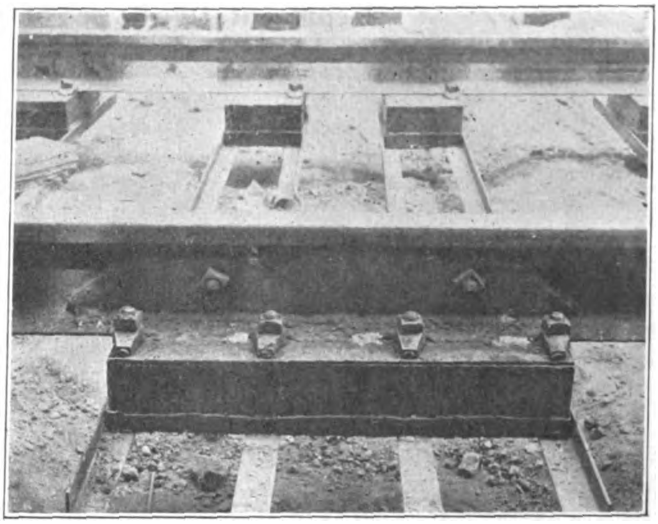
	Dielectric Strength, Volts per Mil	Transverse Strength Lb. per Sq.In. Cross-section	Heat Test, Deg. F.	Absorption After 48 Hours in Cold Water, per Cent
Shellac—mica compounds...	300–330	7,000–11,000	120–185	0.2–5.0
Asbestos—rubber compounds	90–180	3,600– 9,000	300–500	1.5–0.6
Bakelite compounds........	230–300	13,000	225–300	0.6–0.1

No attempt has been made in this article to cover all the materials for insulating purposes or to give more than a bare outline of some of the more salient characteristics thereof. But the subject is one which has received but little attention in the electric railway press, and this article may therefore serve to throw some light on these very interesting materials.

Resilient Track Laid in Wausau

Company Operating in Small Wisconsin City Free from Paving Burden—Constructs Track Ahead of Paving Work Which Is Done by the City

THE Wisconsin Valley Electric Company, which operates the local street railway system in Wausau, Wis., built 1 mile of double track last year, making use of a monolithic-concrete paving and substructure construction and Dayton mechanical ties. As the company was relieved from doing any paving on streets occupied by car tracks, the pouring of the concrete paving in the trackway as well as at the sides of the streets was done by the city. The street railway company therefore assembled the ties and rails, welded the joints and brought the track to grade and alignment ahead of the paving work, and then had the city pour the concrete for the substructure as well as for the paving in the trackway. The concrete pavement was made 8 in. thick outside the car track, while the thickness of concrete in the trackway ran to 15 in. The company then simply reimbursed the city for the additional 7 in. of concrete placed in the track foundation. While the track construction was going on, the old track was thrown over to one side of the street and operation continued, as shown in one of the accompanying pictures.

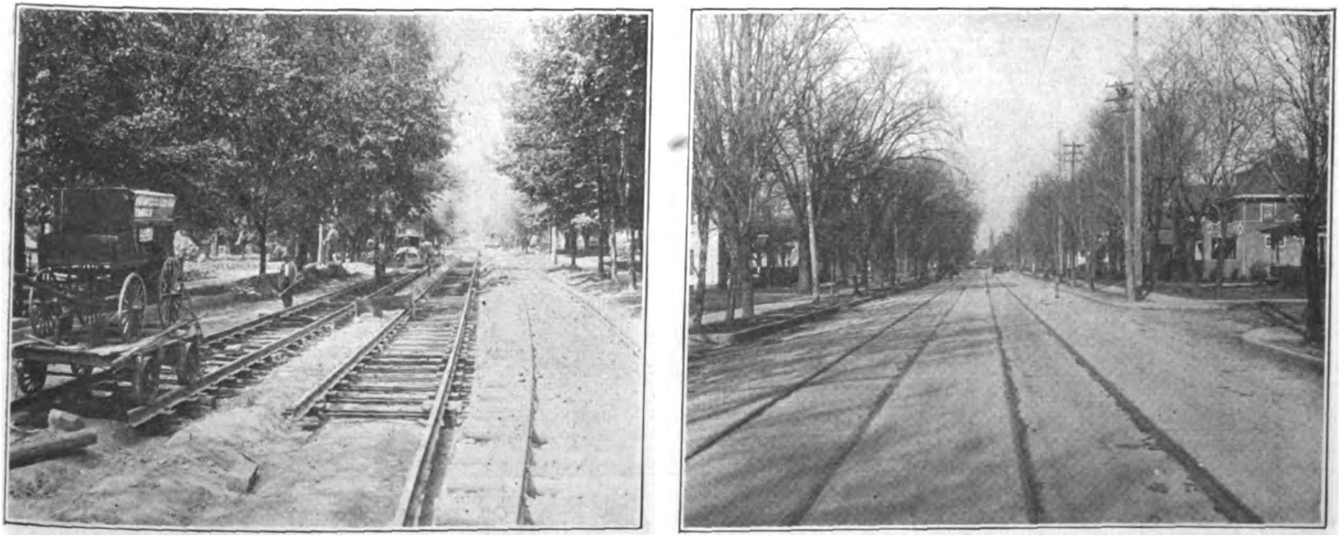


CLOSE-UP VIEW OF JOINT CONSTRUCTION SHOWING APEX WELDING AND RESILIENT MECHANICAL JOINT TIE

The type of construction used, employing T-rail, with the "Apex" welded joints of the Indianapolis Switch & Frog Company and the patented ties and special joint ties of the Dayton Mechanical Tie Company, are shown in the accompanying pictures. In speaking of the results obtained with this type of construction, N. C. Rasmussen, superintendent, made this comment:

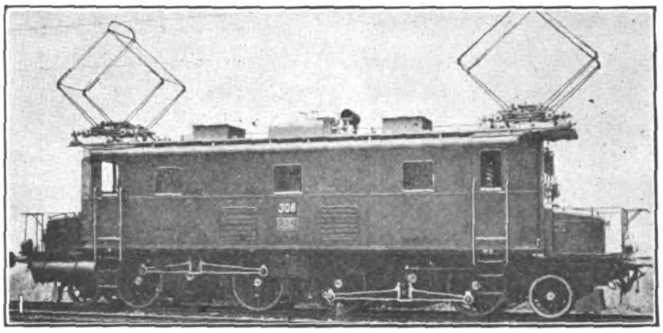
"It is of course too early to say how this track is going to stand up under traffic, as it has not been in service long enough, but from the indications thus far it is all right. It rides smoothly and quietly and we believe it is the coming thing in track construction."

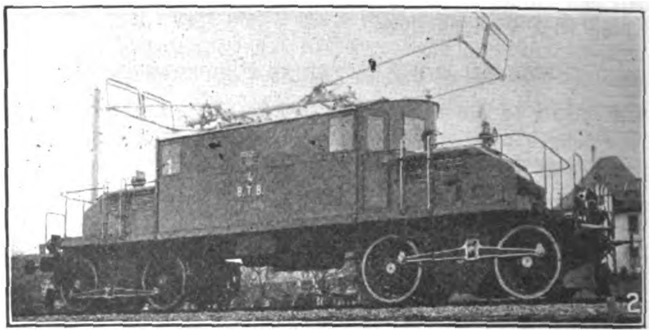
In the accompanying picture showing the completed track construction it will be noted that the concrete paving has been crowned between the rails to make the flangeways. The black jagged appearance along the flangeways is sand and refuse and not chipped concrete, as one might be led to believe.

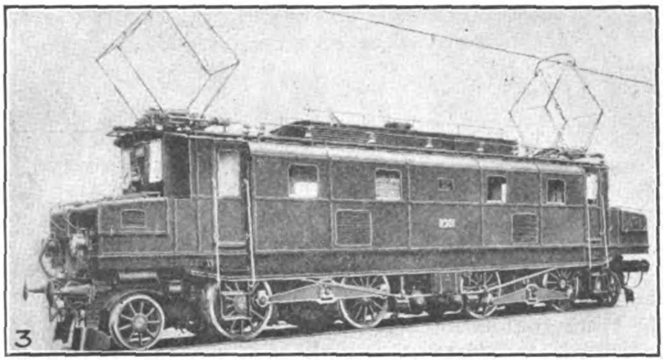


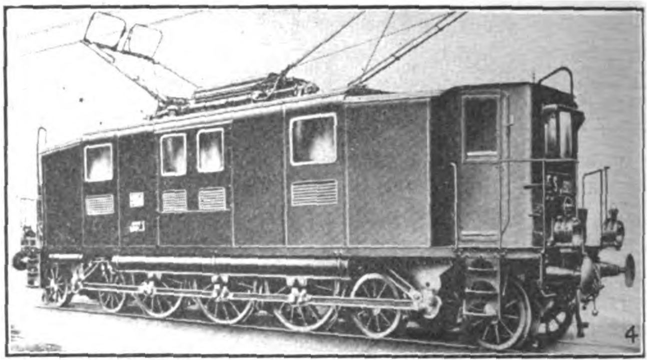
AT LEFT, TRACK CONSTRUCTION BLOCKED UP TO GRADE, SHOWING MECHANICAL TIES IN PLACE READY FOR POURING CONCRETE BASE AND PAVING, AND, AT RIGHT, APPEARANCE OF COMPLETED CONSTRUCTION

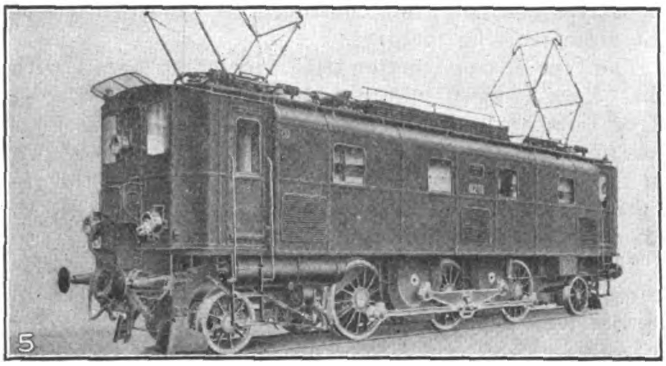
Representative Types of Swiss Electric Locomotives

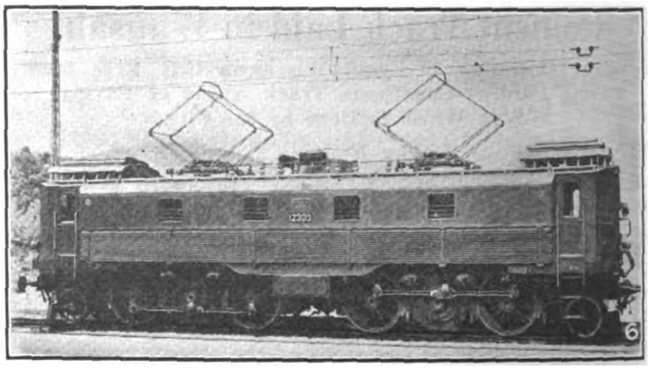


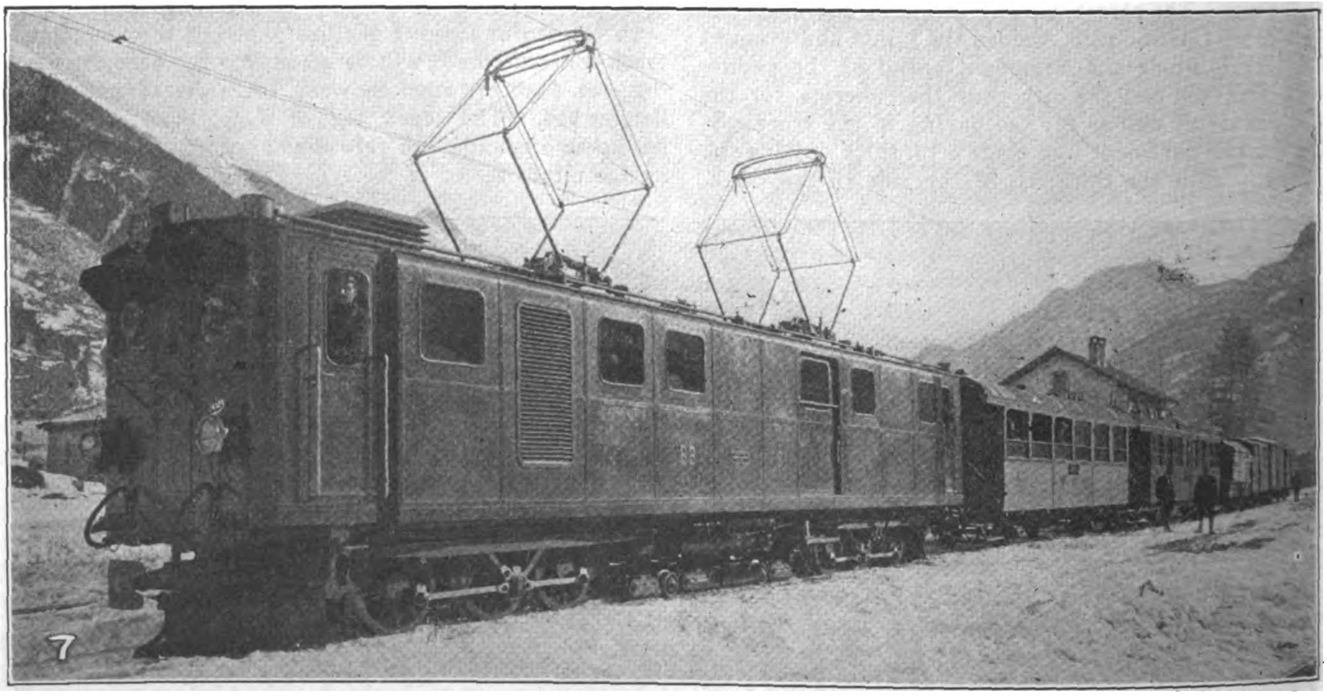












No. 1—Single-phase locomotive for the Bernische Dekretsbahnen made by B. B. & Cie.

No. 2—Latest three-phase type BB locomotive (BBC) for the Burgdorf-Thun Railway.

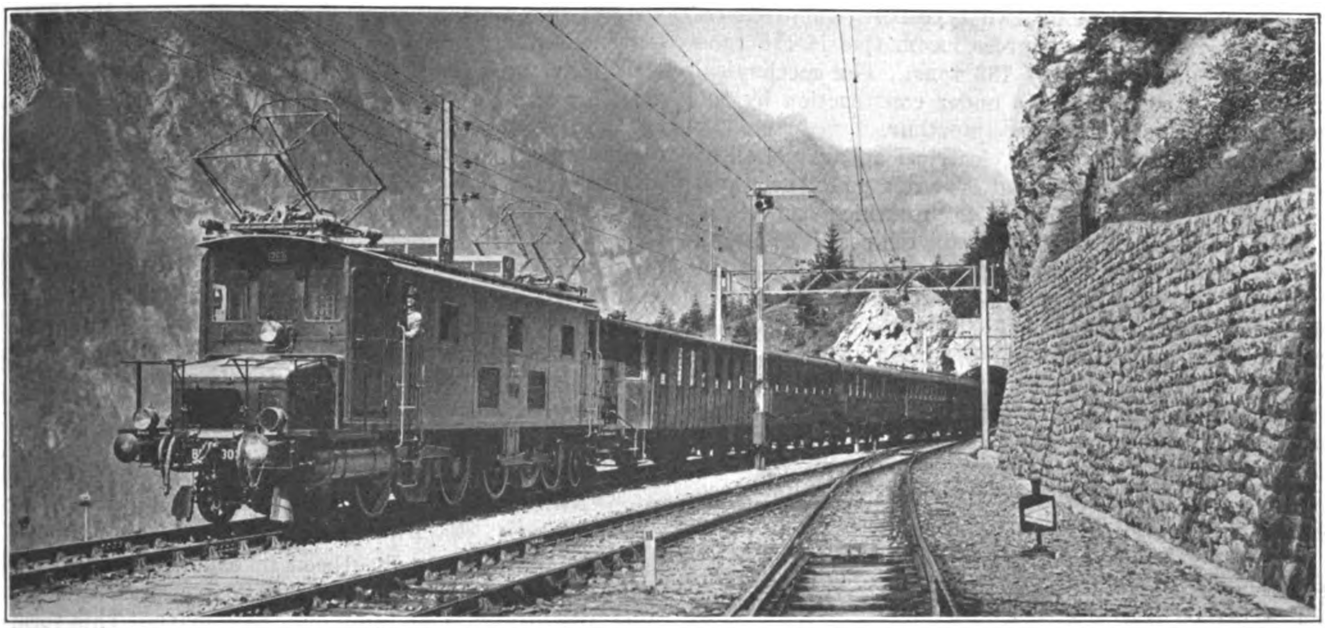
No. 3—Swiss Federal Railways locomotive—an Oerlikon type 1-B-B-1.

No. 4—A three-phase Oerlikon locomotive, Italian State Railways.

No. 5—A-1-C-1 type Oerlikon locomotive used on the Swiss Federal Railways.

No. 6—One of the type 1-B-B-1 locomotives (BBC) used in the St. Gotthard Railway electrification.

No. 7—Bernina Railway type CC single-phase freight locomotive made by Brown, Boveri & Cie. with a 100-ton train at Poschiavo station.



A TYPE 1-BB-1 OERLIKON LOCOMOTIVE OF THE BERNESE RAILWAY

Swiss Electric Locomotive Progress

Details Are Given of Recent Locomotives Equipped by the Leading Two Builders of Electrical Apparatus in Switzerland—Particular Attention Is Given to the Machines for the Federal Railways—Some Experiments with New Types of Drive Are Included, Indicating a Leaning Toward Gears as a Substitute for Side Rods

THE electrification situation in Switzerland was briefly summarized in the issue of this paper for Jan. 1. For that issue the important Swiss manufacturers of electrical equipment, Brown, Boveri & Cie., Baden, and the Ateliers de Construction Oerlikon, Zurich, had arranged to furnish the latest information on the electric locomotive construction of these companies. However, owing to the post-war slowness of the mails the information arrived too late for the annual statistical issue, but it is given in part below. The purpose of this article is to give interesting detail regarding some of the latest commercial and experimental locomotives, for the purpose of indicating the nature of the problems which the necessity for immediate electrification has imposed on the engineers of Switzerland.

LOCOMOTIVES FOR ST. GOTTHARD

Pre-eminent at the moment is, of course, the St. Gotthard electrification, now in partial operation. An illustrated and detailed description of the freight locomotive furnished by the Oerlikon Company appeared in the issue of this paper for Aug. 7, 1920, page 256. Of this type, 1-C-C-1, thirty-three machines have been ordered up to about Jan. 1. This company is also furnishing locomotives of two other types for fast trains, 1-C-1 and 1-B-B-1. Data regarding all of these are given in Table I, and the appearance of the 1-B-B-1 machine is shown in the photographs reproduced.

A number of locomotives have also been furnished for the St. Gotthard electrification by Brown, Boveri & Cie. The plan of the State Railways before the war was to conduct extensive experiments on the Loetschberg line with several types of locomotives for the St. Gotthard electrification, but the critical coal shortage forced the prompt completion of the initial installation. Brown, Boveri & Cie. are building two types of locomotives for this line, one for express passenger trains, the other for freight trains. Following are some details of the former:

The running gear of the machine is in two sections, each containing two driving axles and a pony axle. The two trucks are connected by means of a flexible coupling. Two motors of a truck drive, through pinions, a gear mounted on a jackshaft which is connected by connecting rods with the driving axles. To reduce the vibration due to the single-phase current all pinions are provided with rims flexibly mounted on the centers. This also insures uniformity in contact of the gears on the two sides, the transmission being bilateral, with a 90-deg. angular displacement of the two drives.

The cab rests on two supports on each truck. The center plate of one is fixed, while longitudinal movement of the other is provided. This prevents any transmission of force from truck to truck through the cab. There are also auxiliary points of support for the cab to distribute the weight properly. These are near the interior motor axles.

The locomotive is equipped with Westinghouse air brakes, four brakeshoes to the driving axle. The compressed air for brakes, sanders, whistles and electrical

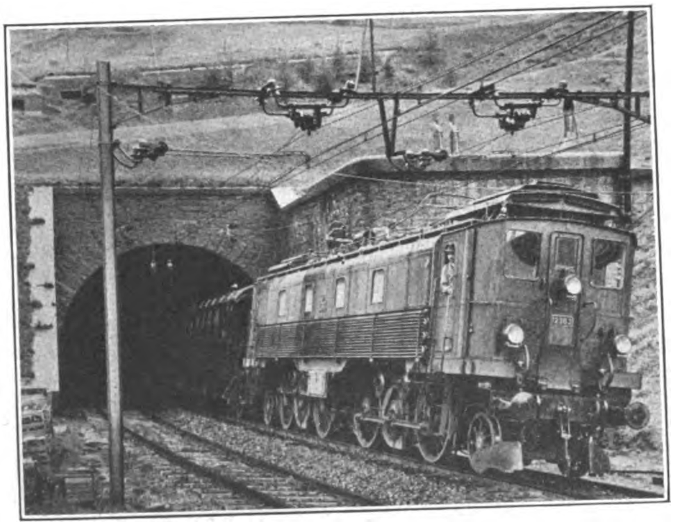
TABLE I—DATA OF OERLIKON LOCOMOTIVES FOR ST. GOTTHARD ELECTRIFICATION

	1-C-1	1-B-B-1	1-C-C-1
Maximum tractive effort, pounds	24,800	39,600	52,900
Horsepower at wheel rim (1½ hour)	1,650	2,250	2,200
Normal speed, miles per hour	32	32	21.7
Maximum speed, miles per hour	66.6	66.6	40.4
Trailing load on 2.6 per cent grade at normal speed, tons	237	330	475
Weight complete with equipment, tons	100	125	141
Maximum wheel pressure, tons	10.7	11.0	10.0
Total length	44 ft. 4 in.	53 ft. 2 in.	63 ft. 7 in.
With or without regeneration	Without	With	With

apparatus is furnished by two type-BBC compressors. The total weight of the express locomotive is 118 tons and the freight locomotive 133 tons. The mechanical parts of the locomotives are under construction by the Swiss Locomotive Works at Winterthur.

In the arrangement of the electrical apparatus, all of the principal control equipment is so related to the transformer as to form a complete group which can be installed or removed through a hole in the roof. The tank of the transformer is designed for the support of the apparatus, its sides being constructed of strong plates reinforced with angle irons. The transformer oil is circulated by means of a pump through cooling pipes mounted on the side walls of the cab. This arrangement is said to provide a transformer system no heavier than one involving air cooling. The transformer, of 1,730-kva. capacity, lowers the voltage from 15,000 or 7,500 to 1,325. Its weight without the cooling coils and pump is 27,560 lb.

Current is taken from the line through two independent pantographs. After flowing through the lightning arrester installed on the roof, it passes through the high-tension circuit breaker and the transformer, thence by way of the motors and the trucks to the rails. The high-tension breaker is installed in an opening provided in the roof.



TRAIN LEAVING THE ST. GOTTHARD TUNNEL AT AIROLO

The four motors of one locomotive form two groups, connected in parallel, the two motors of each group being in series. The series connection is permissible because the motors are mechanically coupled. The motors are of the series compensated type, with a commutating field. Between the armature inductors and the commutator are resistors so placed as to be well ventilated. Regulation of speed is by variation of voltage in eighteen steps from 237 to 1,325 volts (for two motors in series). The voltage is varied by means of an ingenious commutator resembling a storage battery regulator, but with auxiliary switches which break the local circuit as the brushes pass from contact to contact. The locomotives are provided with multiple-unit control so that two can be operated as a unit.

An essential feature of these locomotives will be provision for electric braking for the purpose of reducing brakeshoe wear and the consequent dissemination of iron dust in and about the machine. It was not considered necessary to provide for return of power to the line. A sample locomotive has been provided with resistors, shown mounted on the roof in one of the illustrations, which absorbs on down grades the direct-current power produced by the motors. The location of the resistors was selected to provide maximum natural ventilation. If this type of braking process is satisfactory other locomotives will be similarly equipped.

The locomotives mentioned above are designed for the Erstfeld-Chiasso section of the St. Gotthard electrification, which will be next equipped. For this work the passenger locomotive must climb a 2.6 per cent grade with a 330-ton train at 22 and 31 m.p.h., and the freight locomotive must draw the same load up this grade at 31 m.p.h. or 473 tons at 22 m.p.h. The power developed on the grades is 2,500 hp., with tractive efforts for the two locomotives respectively of 27,500 lb. and 37,400 lb. On the maximum grade the values are 35,200 lb. and 48,400 lb.

NEW TYPE OF LOCOMOTIVE WITH INDIVIDUAL DRIVE OF AXLES

A locomotive which has been in experimental use on the Loetschberg line for nearly two years is equipped with two varieties of individual axle drive. This form of drive has not yet been generally employed in Europe, although it has been popular in America. In Europe the preference has been for few motors of large power rather than many of small power. The designers of this experimental locomotive recognized as ideal the form of drive used on tramway cars, as it gives a uniform rather than a pulsating transmission of torque, and they applied it here in principle. They found it possible to design a single-phase machine with 300 hp. per axle for a speed of from 22 to 28 m.p.h. A motor of this kind weighs, with gears, about 13,200 lb. Application of direct drive of this sort is difficult, however, for express train locomotives. For European conditions three motor axles are in general sufficient, while for the greatest exigencies in express traffic, four driving axles, with 700 to 800 hp. each, are sufficient. This is too much for tramway drive, but even if it were not the necessary speed would be too high.

The present experiment in drive is due to Chief Engineer Tschanz of the Federal Railways. One axle of the locomotive has a drive invented by him, while a second has one designed by Brown, Boveri & Cie.

Both of the schemes involve the placing of the gears outside the driving wheels to insure the maximum space for the motor. In the Tschanz plan the motor is "elastically mounted" on the locomotive underframe. The motor torque is transmitted through an intermediate axle located on about the same level as the motor axle and nearly over the driving axle. Thence the torque is transmitted by means of gears to another axle carried inside the hollow driving axle to a flexible driving coupling on the far side.

In the "BBC" drive the motor is mounted on the locomotive frame directly above the driving axle. The motor torque is transmitted by means of pinions, one on each end of the axle, to gears carried by the locomotive frame and located outside of and directly opposite the driving wheels. Thence it is transferred over to the latter by means of an ingenious link and gear coupling which permits relative vertical movement of the driving gear and the locomotive driving wheel. With this design it would be possible to use a motor as large as 1,000 hp. The external arrangement of gear is said to be particularly advantageous with respect to inspection.

The experimental locomotive has given satisfaction in service and both types of drive have worked well.

Among other interesting recent Swiss locomotives is the new three-phase machine built by Brown, Boveri & Cie. for the Burgdorf-Thun line. This is of extremely simple mechanical construction, with two swivel trucks, each carrying one motor; a design which could be adopted on account of the small power capacity required. In the middle of each truck is a 260-hp. motor geared to a jackshaft, which, through cranks and connecting rods, drives the two axles. As in other drives of this general type the driving pin on the crank works in a vertical slot in the center of the connecting rod so as to permit some vertical movement of the pin with relation to the connecting rod, thus providing for displacement of the truck springs.

The electrical equipment is designed for the mean line voltage of 750, but provision is made for an increase to 1,500. The frequency is 40 cycles per second. Four speeds are provided by means of pole changes as follows: 8.7 m.p.h., 12 poles; 12.4 m.p.h., 8 poles; 18 m.p.h., 6 poles; 27.3 m.p.h., 4 poles. The respective tractive efforts on an hourly rating are 21,300, 15,000, 10,200 and 6,800 lb. The rotor is of the "squirrel-cage" variety, regulation of starting voltage applied to the stator being provided by means of two auto-transformers connected in "V," with taps for various voltages from 214 to 900. At the lower two speeds the stator is "delta-connected"; at the higher speeds, "star-connected." It has two independent windings to permit the changing of the number of poles.

The locomotive is provided with a roomy cab which is available for the auxiliary apparatus, the smaller parts of which are inclosed in cabinets along the walls. Projecting from each end of the cab is a hood which covers the motors and transformer and commutating switch. The total weight of the machine is 96,600 lb., almost equally divided among the four axles.

The Burgdorf-Thun Railway, which is the most important three-phase line in Switzerland, has also ordered two motor cars of an entirely new type from the Oerlikon works. As this article, however, deals with locomotives, details of the motor car will not be given here.

The accompanying illustrations of typical Oerlikon and "BBC" locomotives have been selected to indicate the present trend in Swiss design.

Hunters Find a Canvas Back

A RAILWAY company that had been accustomed to the operation of the old style non-ventilated motor placed in service a number of safety cars equipped with the modern light-weight ventilated type of motor. Recently this company had several cases of roasted armatures develop on these motors and there was no apparent cause for the trouble, as all motors were operating under the same service conditions.

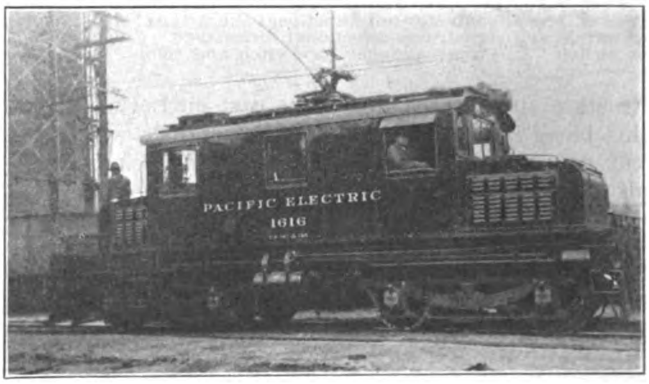
About this time, in connection with service tests that were being made on these cars, the temperatures of the motors were taken at the end of the test run, and to the surprise of the testing force it was noted that the temperature of the No. 2 armature on one of the cars was 35 deg. above that of the No. 1 armature. It was at first thought that perhaps the No. 1 motor was cut out by the operator due to some temporary trouble, but this was not the case. It was then intimated that probably there was some error in the car wiring that had overloaded the No. 2 motor, but the car wiring was found to be O.K. Finally, during the making of a careful inspection of the motors, it was discovered that the No. 2 motor had a strip of canvas under the ventilating covers at the air outlet of the motor frame, thus choking the ventilation of this motor and accounting for the dangerous operating temperatures.

When the carhouse men were questioned it was found that on account of the heavy snows all motors had been closed in the above manner to keep out the snow and water during the winter season. This canvas was supposed to be removed from all motors when the warm weather set in, but apparently this frame was missed, and this carelessness on the part of the carhouse men was responsible for the roasted armatures.

This incident helped to drive home a very important point regarding the keeping of records on armature failures, as it was suggested that if such information had been available on this property the cause of the trouble might readily have been run down by tying up all armature failures to a particular motor frame in position No. 2 on a definite car.

New Locomotives in Service on Pacific Electric Railway

THE Pacific Electric Railway has recently purchased from the Westinghouse Electric & Manufacturing Company two 1,000-hp. locomotives to be used in its interurban freight service. The volume of this traffic has been steadily increasing, especially on the heavy hauls from Los Angeles harbor to the city of Los Angeles, and these two locomotives, together with the fifteen original ones, were needed to handle the traffic.



NEW INTERURBAN FREIGHT LOCOMOTIVE ON THE PACIFIC ELECTRIC RAILWAY

The new locomotives, weighing about 129,000 lb., are 3,000 lb. heavier, although similar in class to those already in use. They are of the steeple double-truck type, having four 250-hp. motors.

The principal improvement is the use of two air compressors having a combined capacity of 150 cu.ft. of air per minute, compared with a total capacity of 100 cu.ft. per minute of the compressors on the older locomotives. The improved and larger compressors are of the three-stage intercooler type driven by a compound dynamotor.

CHARACTERISTIC DATA FOR LOCOMOTIVES

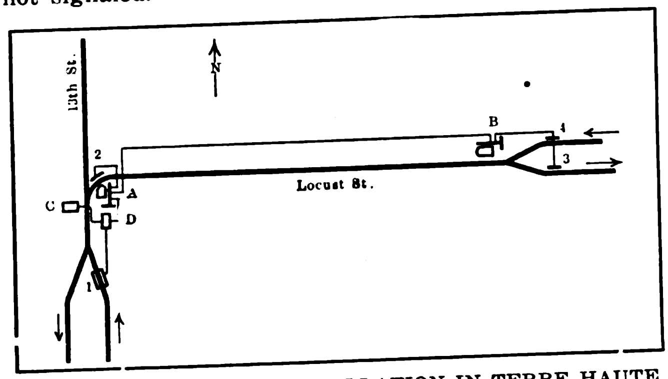
Maximum tractive effort	30,000 lb.
Normal tractive effort at 18 m.p.h	21.000 lb.
Continuous tractive effort with forced ventilation	11,520 lb.
Maximum trailing load	1,200 tons
Average trailing load	600 tons
Maximum speed on level with 600-ton load	25 m.p.h.
Maximum speed on 4 per cent grade with 600-ton load	10 m.p.h.

Combined Signal and Switch Installation

Somewhat Novel Equipment Consisting of an Electric Track Switch Operating in Conjunction with Block Signals on a Single Track Installed by the Terre Haute Company

AMONG the latest additions to the equipment of the Terre Haute Traction & Light Company of Terre Haute, Ind., is an electrically operated track switch which works in connection with a block of automatic signals.

As is indicated in the accompanying diagram, a line of cars runs north and south on Thirteenth Street through a short block of single track that is not signaled. At the corner of Thirteenth and Locust Streets a single-track line turns east on Locust Street. This block is provided with Nachod signals which prevent opposing movements through the block but permit several cars to follow at the same time. A northbound Thirteenth Street car drifting under the current selective contactor 1, which is located about 75 ft. back of the switch point, will not operate the block signals on Locust Street, but will insure the switch point being thrown for the straight track on Thirteenth Street. In order to throw the switch point for the diverging route into Locust Street, a car passing under the selective contactor 1 must apply two or more points of power. This throws the switch point for the turn into Locust Street and also sets the signals. Signal B, at the opposite end of the block on Locust Street, will indicate "Stop" and signal A, located an observation distance ahead of contactor 1, will then show "Permissive." As the car leaves the block at the other end on Locust Street, in passing under contactor 3 it restores both signals to the normal neutral or clear indication.



SWITCH AND SIGNAL INSTALLATION IN TERRE HAUTE
A, B, Signals. 3, 4, Signal contactors non-directional shunt type. 2, Signal contactor uni-directional shunt type. 1, Contactor for switch and signal, non-directional series type. C, Ground box for switch. D, Circuit changer for switch and signal.

A Locust Street car coming west will set signal A at "Stop" and prevent an opposing movement while passing under contactor 4. Signal B will also be set at "Permissive." As the car passes under contactor 2 it will clear the block, providing, of course, that a second car has not followed the first at the permissive signal B, in which case the signal will not be cleared until the same number of cars have passed southward out of the block under contactor 2 as have entered the block under contactor 4. Contactor 2 is inoperative when traversed in the opposite direction. The signals give indication by lights and disks of the same color for each indication.

The Cheatham switch used consists of a powerful double solenoid having a single armature so connected to the switch point as to throw it to either position according to which coil is energized. Each solenoid of this switch will exert a pull of over 400 lb. These solenoids are installed in a waterproof cylinder housed in a ground box with a removable cover. A relay or circuit changer is mounted on a pole near the switch. The contactor is of the series type without moving parts, the front and back contacts on the armature being connected respectively to the two switch operating solenoids. The current selective relay is adjusted so as not to pick up its armature with the current used for light, heaters and the compressor motor, but it will pick up on application of one or two points of power through the car motor. The circuit changer box also contains a time limit relay which will open the circuit to the operating solenoids and thus prevent their burning out if the car stands on the contactor for a period of more than five seconds. In operating with the Cheatham switch the motorman need not observe the switchpoint, but will always draw power under the contactor for the diverging route and will drift for the straight route irrespective of the previous position of the switchpoint.

Should it be desirable to signal the single-track block on Thirteenth Street contactor 1 may still be connected so that cars drifting under it will throw the switch and set the signals for Thirteenth Street and cars using power under this contactor will throw the switch and set the signals for Locust Street. With the installation of this equipment every important switching point on this property has been equipped with the heavy type of switches and locks. The signals used were furnished by the Nachod Signal Company, Inc., and the switches by the Cheatham Electric Switching Device Company. The installation was supervised by an engineer from the manufacturers.

Spring Snow in Winnipeg

SNOW CONDITION IN WINNIPEG

THE accompanying illustration shows the conditions with which the Winnipeg (Canada) Electric Railway is contending this spring. The snowstorm which caused the snow banks shown fell on March 16, and the photographs were taken on March 29, 1921. There had been no thaw or additional snowfall between those dates. The snowfighting equipment used by this railway was described in an article in the ELECTRIC RAILWAY JOURNAL for Feb. 19, 1921. It rendered efficient service in combating this belated storm.

Determination of Forces on Eccentric Levers and Bell Cranks*

Methods for Determining the Forces Developed by Eccentric Levers and Standard Bell Cranks Are Given, Also General Methods of Applying the Leverage Rule, Together with Simplified Solutions and Rules for Solving Brake Leverage Problems by Using the Proportional Lengths of Levers Instead of Their Actual Length

BY H. M. P. MURPHY

THE eccentric type of lever was previously described and illustrated in the first article of this series published in the ELECTRIC RAILWAY JOURNAL for Jan. 15, 1921. It may always be treated as a modified form of the straight-line lever when the subject of force multiplication is involved, providing that the following instructions are carefully observed. The reasons for this will be made apparent by the subsequent illustrations and examples.

When an eccentric lever is in the exact position in which it is to perform its duty, the forces acting upon it may be determined thus: Extend the straight line, passing through the middle point and one end point of the lever, till it meets the line of action of the force acting at the other end point, then consider this straight line as a simple straight-line lever and apply the same rules to it as to any straight-line lever. The three points of such a lever are, of course, the middle point, and the end point of the eccentric lever through which the straight line passes, and the point at which this line meets the line of action of the force acting at the other end point of the eccentric lever. It is important to note here that the forces acting on an eccentric type of lever must be parallel, just as in the case of the straight-line lever.

FORCES DEVELOPED BY ECCENTRIC LEVERS

In order to illustrate the use of the preceding rule, consider the eccentric lever shown in Fig. 1 and let a weight of 6½ lb. be suspended from the point *a*, then to find the weight which must be suspended from the point *c* (*i.e.*, to find the force developed at the point *c*) in order to produce equilibrium, draw a straight line through the points *a* and *b*, and extend it till it cuts the line of action of the left-hand weight at a point *d*. Now consider the line *a b d* as a straight-line lever, then by applying the "Leverage Rule" and considering the middle point, *b*, as the fulcrum,

The desired force =

$$\frac{\text{(the known force)} \times \text{(the lever arm of the known force)}}{\text{the lever arm of the desired force}}$$

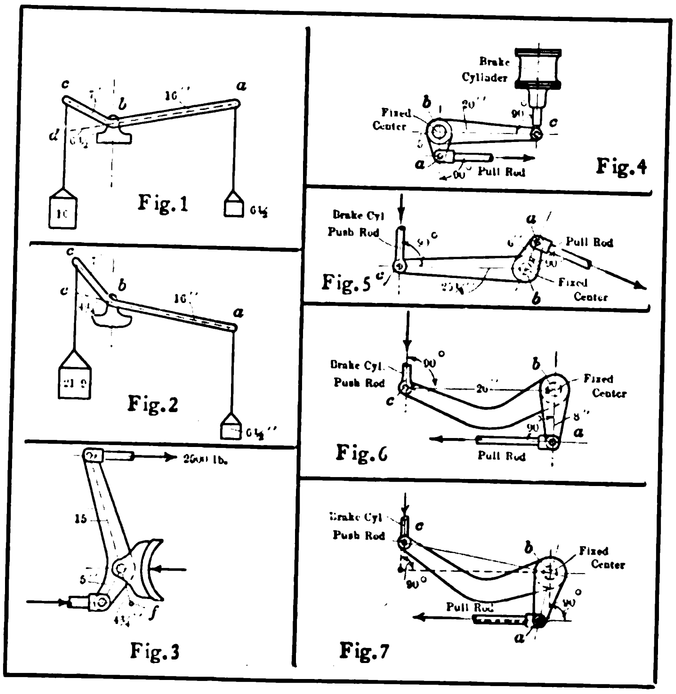
or

Force acting at d (or c) =

$$\frac{(\text{Force acting at } a) \times (\text{Lever arm of force at } a)}{\text{Lever arm of force at } d \text{ (or } c)}$$

$$\text{Force acting at } d \text{ (or } c) = \frac{6.5 \times 16}{6.5} = 16 \text{ lb.}$$

The length of the lever arm, *b d*, is, of course, obtained by measuring the actual rigging or a scaled drawing. The force acting at the point, *b*, may also be found by the same method, thus, applying the "Leverage Rule" and considering the point *d* as the fulcrum,



COMMON FORMS OF ECCENTRIC LEVERS AND BELL CRANKS

Figs. 1 and 2—Diagrams to illustrate forces developed.
Fig. 3—Practical form of eccentric lever.
Figs. 4, 5, 6 and 7—Various forms of bell cranks.

$$\text{Force acting at point } b = \frac{6.5 \times 22.5}{6.5} = 22.5 \text{ lb.}$$

which is correct for force at *a* plus force at *d* must equal force at *b* (see Article 1), that is 6.5 + 16 = 22.5 lb.

Now suppose that the eccentric lever shown in Fig. 1 is swung through a slight angle, about the point *b*, and is thus brought into the position shown in Fig. 2, and let it be required to find what weight (that is, force) must be applied at *c* to balance a weight of 6½ lb. applied at *a*. To solve this problem, draw a straight line through the points *a* and *b* and produce it till it intersects the line of action of the left-hand force at the point *e*. It will be readily seen from the construction of the lever (shown in Figs. 1 and 2) that the line *b e* is much shorter than the line *b d*, consequently a greater force must be applied at the point *c* to balance the 6½-lb. weight applied at *a* in the case under consideration than in the preceding example. To find the force acting at

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*This is the fourth of a series of articles on forces developed in brake riggings. Others appeared in the Jan. 15, Feb. 19 and March 19 issues of this paper.

c, Fig. 2, consider the middle point, *b*, of the straight-line lever, *a b e*, as the fulcrum, then,

$$\text{Force acting at } e \text{ (or } c\text{)} = \frac{6.5 \times 16}{4.75} = 21.9 \text{ lb.}$$

and in this case the force acting at *b* is 28.4 lb.

IMPORTANT FACTS DEDUCED FROM EXAMPLES

The preceding examples show that when considered in some specified position the forces acting on an eccentric lever may be easily found by the simple method outlined in the first part of this article, but that, although the force acting at one point of an eccentric lever may be constant, the forces acting at the remaining points depend not only on the dimensions of the lever but also on the position of the lever. It should be noted here that as previously pointed out, this is not the case with the straight-line type of lever, the forces acting on which are entirely independent of the position or angle of the lever, and which, therefore, always bear the same fixed relation to each other, this relation depending only on the dimensions of the lever. For these reasons it is obvious that an eccentric type of lever is an extremely undesirable form to use in brake riggings, because as the brakeshoes wear, the leverage ratio will continually change, either becoming greater or less than the amount desired.

A practical form of eccentric lever is illustrated in Fig. 3. This type is found most frequently in traction service where the clearances are small and therefore where it is sometimes quite impossible to use the straight-line lever. As an example, let it be required to find the force delivered to the brakeshoe, in Fig. 3 when a force of 2,500 lb. acts on the pull rod attached to the upper end point of the lever. By drawing a straight line as indicated through the upper end point and the middle point of the lever and continuing it till it meets the line of action of the lower end force, and then measuring the length of this line (4¾ in.), and considering the point of intersection *f* as the fulcrum, we have:

$$\text{Force on brake beam} = \frac{2{,}500 \times 19.75}{4.75} = 10{,}395 \text{ lb.}$$

PRINCIPLES OF BELL CRANKS

It is important to state here that an eccentric lever must not be confused with the form of force-multiplying device known as a "bell crank," the standard form of which may be defined as follows:

A standard bell crank is a force-multiplying device which is adapted to maintain a fixed relation between the forces involved, and which consists of two rigid arms or bars securely connected with each other through the medium of a shaft. The standard form of bell crank must always be so constructed and installed that both arms will be acted upon at their free ends by independent forces which maintain constant directions, such that their lines of action will simultaneously form 90-deg. angles with the center lines of their respective arms.

It will be readily seen from the preceding definition that the forces acting on a bell crank of standard design are parallel only when the shaft center and the two end points lie in the same straight line. Bell cranks of various forms are illustrated in Figs. 4, 5, 6 and 7, where it will be noted that the center line of each arm is simply a straight line drawn through the end point (or pin center) of the arm and the shaft center, whether the arm is straight or curved between these points. It will also be seen that the angle made by the center lines of the two arms may have any value whatever, as shown in Fig. 5, but usually for railway brake riggings this angle is given a 90 or 180 deg. value because of the location of the brake cylinders on locomotives, where the bell crank is most frequently used.

In this connection it should be pointed out that as the force action on the shaft of a bell crank is quite complicated and as the shaft is always supported by a fixed bearing, only the two forces acting at the free ends of the arms will be considered in the following discussion. The bearing forces are, of course, of no importance in any problem involving the subject of braking power. It should, moreover, be noted that a standard bell crank will always maintain a fixed relation between the forces acting on it, regardless of the position of the crank, providing that the lines of action of the various forces remain parallel to their own standard directions. Thus, if in Fig. 6, a given force be applied to the brake cylinder push rod, a certain definite force will be developed on the pull rod, and this force will remain constant no matter what angle the bell crank may be swung through, providing that the line of action of the push rod force remains vertical and the line of action of the pull rod force remains horizontal, as shown in Fig. 7. Of course, in practice it is impossible always to maintain these exact ideal conditions, but when they are obtained approximately the forces concerned will differ so slightly from the desired values that the variations produced need not be considered. This is also true of the "straight-line" type of lever.

DEFINITION OF "LEVER ARM" FOR A STANDARD BELL CRANK

The fixed, or shaft, center of a bell crank should always be considered as the fulcrum, or point about which the crank turns, for the end forces are the only ones which it is necessary to determine in braking power computations. Keeping this fact in mind the following definition will be readily understood:

The lever arm of a force acting at the free end of one of the arms of a standard bell crank is simply the straight line distance between the fulcrum (*i.e.*, shaft center) and the point of application of the specified force.

In order to obtain a clear understanding of the preceding definition, it will be well to refer to Figs. 4, 5 and 6, and to note that in each case when the point *b* is considered as the fulcrum the lever arm of the pull rod force is the line *b a* and the lever arm of the brake cylinder force is *b c*.

If the definition of the term "lever arm" for a standard bell crank is kept clearly in mind and if either one of the two end forces acting on the crank is known, the remaining force may always be found by aid of the "Leverage Rule" which was previously given for straight line levers (see article 1); that is,

$$\text{The desired force} = \frac{\text{(The known force)} \times \text{(The lever arm of the known force)}}{\text{The lever arm of the desired force}}$$

To illustrate the method of determining the forces acting on a standard bell crank let us consider the standard bell crank shown in Fig. 4 and let it be required to find the force acting on the pull rod when the dimensions are as indicated and a 14-in. diameter brake cylinder is used, the air pressure being 50 lb. per square inch.

The table previously published in article 3 of this series gives the total force on the push rod as 7,697 lb., then by applying the "Leverage Rule" and considering the shaft center (or middle point) as the fulcrum,

$$\text{Force on pull rod} = \frac{(\text{Force on push rod}) \times (\text{lever arm of force on push rod})}{\text{lever arm of force on pull rod}}$$

$$\text{Force on pull rod} = \frac{7{,}697 \times 20}{5} = 30{,}788 \text{ lb.}$$

Now consider the standard bell crank shown in Fig. 5, and let it be required to find the force acting on the pull rod, when the force on the brake cylinder push rod is equal to 6,786 lb.

To solve this problem, consider the shaft center as the fulcrum, then, by applying the "Leverage Rule,"

$$\text{Force on pull rod} = \frac{6{,}786 \times 25.25}{6} = 28{,}558 \text{ lb.}$$

Next consider the standard bell crank shown in Figs. 6 and 7 and let it be required to find the force acting on the pull rod, when a force of 10,053 lb. acts on the brake cylinder push rod.

To solve this problem, consider the shaft center as the fulcrum, then, by applying the "Leverage Rule,"

$$\text{Force on pull rod} = \frac{10{,}053 \times 26}{8} = 32{,}672 \text{ lb.}$$

The preceding discussions of levers and bell cranks have shown that in order to determine the forces acting on (or developed by), these types of multiplying devices it is merely necessary properly to apply the "Leverage Rule" given in article 1. Consequently, it will now be well to restate this rule in a more general way and to give a brief summary of the simple but important considerations involved in its correct use.

When the force applied at one of the points (or pin centers) of a lever or bell crank is known and it is desired to find the force developed at a second point, consider the third (*i.e.*, remaining) point as the fulcrum, then the desired force may be found by multiplying the known force by its own lever arm and dividing this product by the lever arm of the desired force.

This rule may, as previously stated, be expressed in the following mathematical form:

$$\text{The desired force} = \frac{(\text{The known force}) \times (\text{the lever arm of the known force})}{\text{the lever arm of the desired force}}$$

In order properly to apply the "General Leverage Rule" it is merely necessary to remember that the lever arm of any force always depends upon the location of the point considered as the fulcrum and is simply a straight-line distance which must be measured in the manner described in each case. It is also essential to note that the shaft center of a bell crank is the only point which it is ever desirable to select as a fulcrum, but that any one of the three points of a lever may properly be considered as a fulcrum whether there is a fixed point or not.

Attention should, moreover, be called to the fact that the "General Leverage Rule" is based on the assumptions that the three forces acting on a lever are always parallel to each other and that each of the end forces acting on a bell crank remains parallel to its standard direction. It is, therefore, essential that these conditions be fulfilled as closely as possible in practice, in order that the forces concerned may bear the proper relations to each other. Slight variations from this desired state of affairs are always met with in actual constructions, but the degree of variation is so small in all good designs of brake riggings that it may be neglected.

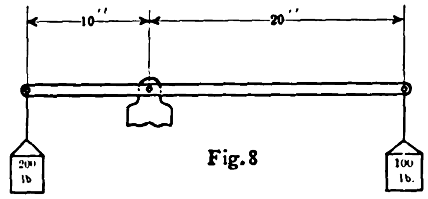

10"
20"
200 lb
100 lb.

Fig. 8

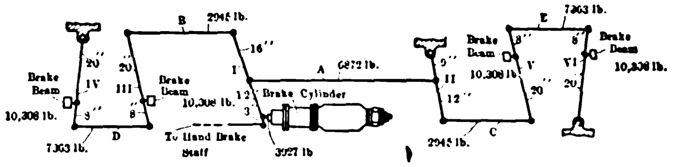

B
2946 lb.
16"
E
7363 lb.
Brake Beam
10,308 lb.
20"
20"
IV
III
Brake Beam
10,308 lb.
8"
8"
7363 lb.
D
I
A
6872 lb.
12
3
Brake Cylinder
To Hand Brake Staff
3927 lb
9"
II
12"
10,308 lb.
V
VI
8"
8"
20"
20
C
2945 lb.

Fig. 10

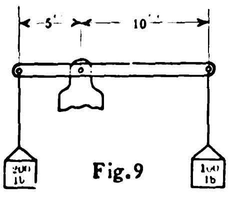

5"
10"
200 lb
100 lb

Fig. 9

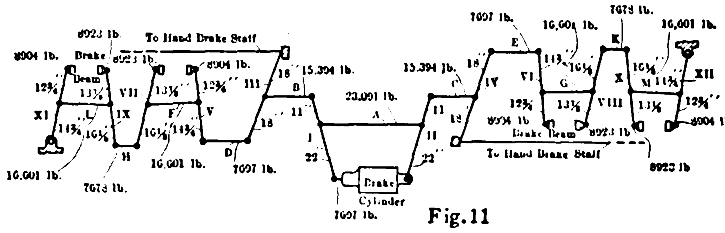

8923 lb
To Hand Brake Staff
8904 lb.
Brake Beam
8923 lb.
8904 lb.
12¾
13⅛
VII
13⅛"
12¾"
III
18
15,394 lb.
B
XI
L
IX
F
V
11
14¾
16¼
16¼
14¾
18
H
D
16,001 lb.
7078 lb.
16,001 lb.
7097 lb.
23,091 lb.
A
I
22
Brake Cylinder
7097 lb.
11
11
22"
15,394 lb.
C
18
IV
E
7097 lb.
VI
G
16,001 lb.
K
7078 lb.
16,001 lb.
11¾
16¼
X
16¼
M 11¾
XII
12¾
13⅛
VIII
13⅛
12¾"
8904 lb
Brake Beam
8923 lb
8904 lb.
To Hand Brake Staff
8923 lb

Fig. 11

FIGS. 8 AND 9. DIAGRAMS TO ILLUSTRATE LEVER RATIOS. FIGS. 10 AND 11. BRAKE RIGGING DIAGRAMS

LEVER RATIOS AND SIMPLIFIED METHODS FOR THE SOLUTION OF BRAKE LEVERAGE PROBLEMS

In all of the preceding discussions of the subject of leverage the actual dimensions of each lever and bell crank were always given when the forces developed were required, but obviously this is not absolutely necessary, as it is simply the comparative lengths of the lever arms that are essential: For example, as shown in Fig. 8, if a weight of 100 lb. is suspended from the end point of a lever at a distance of 20 in. from the middle point, a force of 200 lb. will be developed at the other end point, if it be located at 10 in. from the middle point. It is also equally clear, as indicated in Fig. 9, that if a weight of 100 lb. act at one end point of a lever at 10 in. from the middle point, a force of 200 lb. will also be developed at the other end point if it be located at 5 in. from the middle point. These facts may be demonstrated by aid of the "Leverage Rule" as follows:

In the first case:

Weight on short arm =

$$\frac{100 \times 20}{10} = 100 \times \frac{20}{10} = 100 \times 2 = 200$$

And in the second case:

Weight on short arm =

$$\frac{100 \times 10}{5} = 100 \times \frac{10}{5} = 100 \times 2 = 200$$

It is therefore perfectly obvious that the relation existing between any two forces acting on a lever depend only on the comparative lengths of the lever arms concerned; that is, on the ratio of one of the lever arms to the other. Consequently it is quite common practice to speak of a lever as being divided in a certain ratio if it is distinctly understood that a certain definite point is considered as the fulcrum. When using this expression (*i.e.*, "lever ratio") it should, however, be emphasized that it is positively absurd to do so unless the assumed fulcrum be clearly specified; for example, the lever shown in Fig. 8 has a ratio of 2 to 1 when the middle point is considered as the fulcrum, a ratio of 3 to 1 when the left-hand end point is considered as the fulcrum and a ratio of 3 to 2 when the right-hand end is considered as the fulcrum. Much confusion is, therefore, apt to arise from an improper use of the term "lever ratio," and consequently it is strongly recommended that such an expression never be employed unless a positive means of reference is furnished, such as a sketch, when the ratio of one clearly specified lever arm to another may be mentioned without any possibility of confusion.

If the points mentioned in the preceding paragraph are kept clearly in mind, the following rules or laws will prove of much value in simplifying leverage problems.

First—When any two levers are divided in the same ratio with respect to two corresponding points considered as fulcrums these levers will also be divided in equal ratios with respect to all corresponding points.

To illustrate this, consider the levers, I and II, shown in Fig. 10, neglecting the 3-in. extension on lever I for the hand-brake attachment. These levers have the following ratios with respect to the corresponding points mentioned, considered as fulcrums:

With respect to the pull rod end:

Ratio of lever I $= \frac{28}{16} =$ 1¾ to 1

Ratio of lever II $= \frac{21}{12} =$ 1¾ to 1

With respect to the tie rod, *A*, or middle point:

Ratio of lever I $= \frac{16}{12} =$ 1⅓ to 1

Ratio of lever II $= \frac{12}{9} =$ 1⅓ to 1

With respect of cyl. end of I and fixed end of II:

Ratio of lever I $= \frac{28}{12} =$ 2⅓ to 1

Ratio of lever II $= \frac{21}{9} =$ 2⅓ to 1

Second—When all of the levers connecting with the right-hand truck of a car are divided in the same ratios, with respect to similar points considered as fulcrums, as the corresponding levers connecting with the left-hand truck, the sum of the forces delivered to the brake beams of one truck will always be exactly equal to the sum of the forces delivered to the brake beams of the other truck.

As an illustration of this again consider the brake rigging shown in Fig. 10, and compare all corresponding levers with each other by considering similar points as the fulcrums; for example, with respect to their middle points, the ratios are:

Lever I $\frac{16}{12} =$ 1⅓ to 1 Lever II $\frac{12}{9} =$ 1⅓ to 1

Lever III $\frac{20}{8} =$ 2½ to 1 Lever V $\frac{20}{8} =$ 2½ to 1

Lever IV $\frac{20}{8} =$ 2½ to 1 Lever VI $\frac{20}{8} =$ 2½ to 1

The levers I, III and IV, connecting with the left-hand truck, are divided in the same ratio with respect to similar points (the middle point being considered in each case as the fulcrum) as the corresponding levers, II, V and VI, respectively connecting with the right-hand truck. Consequently the sum of the forces delivered to the brake beams of each truck will be the same. The work of solving this example may therefore be reduced about one-half, for after having found that the sum of the forces delivered to the brake beams of the left-hand truck is equal to 10,308 + 10,308 lb.; that is, to 20,616 lb., the sum of the forces delivered to the brake beams of the right-hand truck is also known to be 20,616 lb., by aid of the foregoing reasoning.

Third—When the live and dead levers on a truck are all divided in the same ratio, with respect to similar points considered as fulcrums, the forces delivered to each of the brake beams will be equal to each other.

To illustrate this again consider the brake rigging shown in Fig. 10. Now the force delivered to the brake beam of lever III is equal to 10,308 lb. Consequently as the truck levers III and IV are divided in the same ratio with respect to similar points, the force delivered to the brake beam of lever IV will also be equal to 10,308 lb., this being determined by aid of the third rule just given, instead of by the long method of calculation given in the third article of this series.

The construction shown in Fig. 11 may also be used to illustrate this principle, for although the ratios of the truck levers are not exactly the same they are so nearly alike that the slight variation is of no practical importance; thus, considering the middle points of levers V, VII, IX and XI as the fulcrums, the ratio of each is:

Lever V $\frac{14.75}{12.75} = 1.157$ to 1

Lever VII $\frac{16.125}{13.875} = 1.162$ to 1.

Lever IX $\frac{16.125}{13.875} = 1.162$ to 1

Lever XI $\frac{14.75}{12.75} = 1.157$ to 1.

Consequently, as the force delivered to the brake beam of lever V is equal to 8,904 lb., the forces delivered to the beams of levers VII, IX and XI are also known to be approximately equal to 8,904 lb. by aid of the third law in question. Of course if the ratios of the levers V, VII, IX and XI had been exactly equal, the forces delivered to each of the brake beams would also have been exactly equal. In all cases where the ratios of the truck levers are not equal, or very nearly equal, the short method just illustrated should not be used for their solution.

Fourth—When the two cylinder levers on a car are divided in the same ratio, with respect to similar points, the forces delivered to each of the end pull rods connected to them will be equal.

As an illustration of this, consider the cylinder levers I and II in Fig. 10. These levers have already been shown to be divided in the same ratio with respect to similar points, consequently, by the fourth law just stated, if a force of 2,945 lb. is delivered to rod *B*, the same force (2,945 lb.) will also be delivered to the rod *C*; this method will therefore considerably simplify the work otherwise required to obtain the same results.

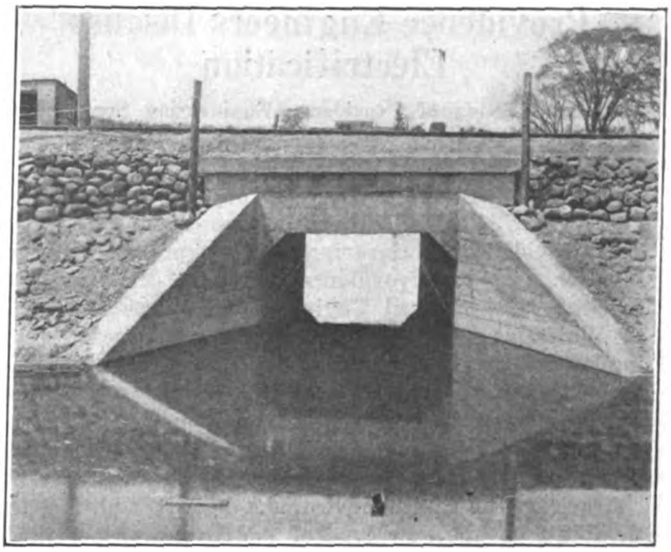
Raising a 500-Ton Concrete Culvert

A Washout on the Lines of the Rochester & Syracuse Railroad Undermined the Entire Footing of a Culvert, Which Was Successfully Salvaged by Raising to Its Original Position

By D. E. Crouse

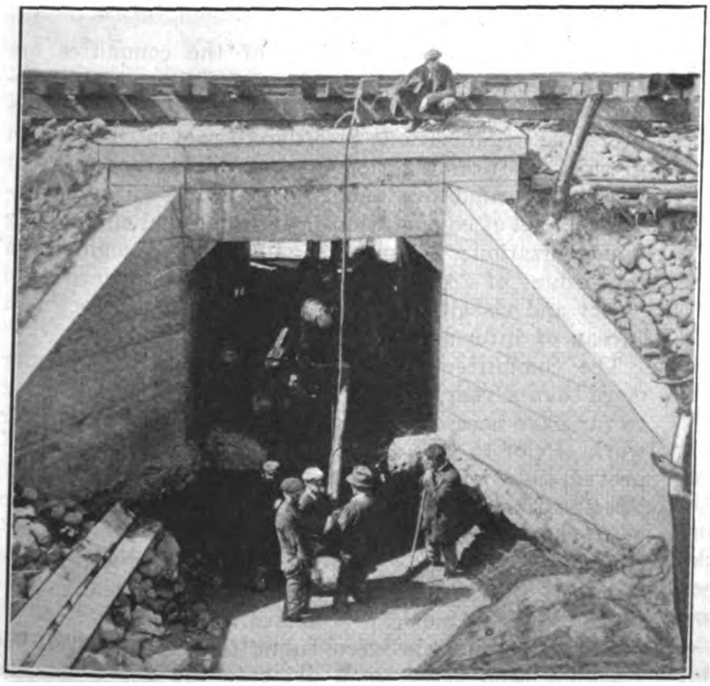
Chief Engineer Rochester (N. Y.) & Syracuse Railroad

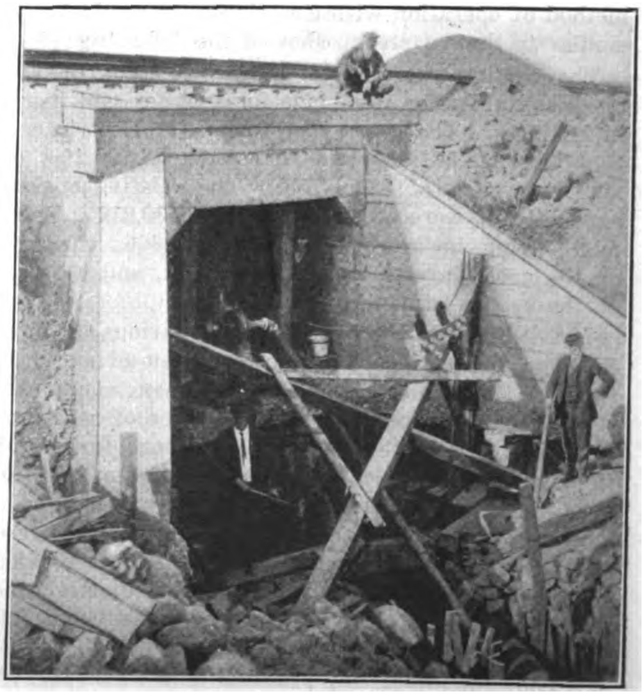
THE accompanying illustrations show various stages of the work of salvaging a 500-ton concrete culvert which was washed out during the spring flood last year on the lines of the Rochester & Syracuse Railroad. The flood undermined the entire footing of the culvert shown and the south end of the culvert dropped about 4 ft. Before the high water subsided timbers were placed over the culvert to carry the railroad traffic, and as soon as the flood abated the normal stream was pumped out dry in order to make an inspection of the damage and ascertain how repairs could be made in an economical and satisfactory manner.


BRIDGE IN PLACE, WITH NORMAL STREAM FLOWING THROUGH AFTER REPAIRS WERE COMPLETED

In order to keep the stream below the foundation level, a 3-in. centrifugal pump was used on the south side and a 4-in. centrifugal pump was placed on the north side of the bridge. As shown in one of the accompanying illustrations it was found that the entire footing was undermined and that the culvert was practically resting on the tips of the wing walls. As there were no fractures in the concrete, it was determined to try and jack the culvert up to its original position and then replace the foundation. Earth was excavated from the sides of the culvert in order to free the batter and jacks were then placed under the entire footing course. Approximately 900 tons capacity in jacks was used and the culvert was successfully raised to its original position without a single fracture developing in the concrete.

With the culvert in place a new footing course was run in and the jacks were removed. The repairs as outlined cost $650, and a replacement of the culvert which otherwise would have been necessary would have cost about $4,000.


BRIDGE AFTER NORMAL STREAM HAD BEEN PUMPED OUT


WALLS EXPOSED AND JACKS PLACED READY FOR RAISING

Providence Engineers Discuss Electrification

At Joint Meeting of Providence Engineering Society and Providence Section A. I. E. E., C. C. Whittaker Outlines Electrification Status on a Number of Steam Railroad Properties

AN ILLUSTRATED lecture was given before the Providence Engineering Society, meeting in conjunction with the Providence Section of the American Institute of Electrical Engineers, on March 15, by C. C. Whittaker, railway engineering department Westinghouse Electric & Manufacturing Company. Among other things he said that studies on the substitution of the electric locomotive for steam motive power on a number of railroads have indicated that the resulting operating economies are sufficient not only to carry the charges on the capital investment but, in addition, the flexibility of the new type of motive power permits a greater volume of traffic to be handled over existing trackage and thereby obviates additional capital expenditure for increased trackage required with steam operation. In some cases it has been found that electrification will permit a road to care for a 75 per cent increase in tonnage with less capital expenditure than would be necessary for the expansion of steam facilities. In most cases the operating economies take care of the fixed charges on the increased capitalization.

In one case it was found that the gross investment for electric operation would be $2,939,000 as compared with $1,090,000 for steam, the net investment therefore being $1,849,000. However, the relative operating expenditures were estimated at $500,760 and $925,165, a saving in operation of $424,405. The return on the gross investment was 14.45 per cent and on the net investment 23.2 per cent. The costs of generated power were practically the same in this case under electric and steam operation, due to the fact that the location was in a coal mine district where coal was cheap.

A study made for a single-track Western railroad, where congestion was not involved and the general method of operation with electric power would be quite similar to that of steam, showed the following:

The section represented 133 route-miles of single track and provision was made for a 40 per cent increase in business. The gross investment for electric operation was $12,561,000 and for steam $3,599,260, or a net investment of $8,961,740. The relative operating expenditures were $3,826,381 and $5,530,217. The annual saving in operation was $1,703,836; the return on the gross investment, 13.6 per cent, and the return on the net investment, 19 per cent.

Mr. Whittaker then took up the various arguments in favor of electrification that have been advanced from time to time and briefly touched upon a number of typical installations. As to the matter of systems, he said that each system in use has reasons for its adoption, which fact is looked upon by broad-minded engineers as the one big factor that has caused the advancement of electric motive power to its present-day position. A decision as to system for a particular road or group of roads should be based upon engineering analysis from the standpoint of present and future requirements.

Among the interesting practical data which Mr. Whittaker gave were some relating to the Pennsylvania Tunnel and Terminal electrification in New York City. Here thirty-three 166-ton electric locomotives, each equipped with two 2,000-hp. motors, have handled all the passenger trains into and out of the New York terminal for the past ten years. They have made a total mileage of more than 7,000,000, with 64,437 miles per locomotive detention and 11,456 miles per minute detention, including mechanical, electrical and man failures. The locomotives require tire turning on account of worn flanges every 50,000 miles on the average, the actual figure varying between 25,000 and 100,000 miles. One engine recorded 142,000 miles between tire turnings. Third-rail shoes require replacement in summer on a 15,000-mile basis and in winter on a 3,000-mile basis. The original commutator has not been turned since it went into service. Motor brushes have lasted for 150,000 miles and motor bearings are renewed on a 30,000-mile basis. The maintenance of these locomotives over an extended period has cost approximately one-sixth that of the equivalent steam locomotives.

Annual Report of the A. E. Standards Committee

This National Clearing House for Technical Information Is Now a "Going Concern"—Contributions from Industrial Associations and Companies Interested Will Be Required to Supplement Dues

ALTHOUGH the annual report of the American Engineering Standards Committee will not appear in final form for some time, from advance galley proofs it is possible to summarize a few of the facts of electric railway interest which it will contain. The committee now comprises the following member bodies: American Electric Railway Association, American Institute of Electrical Engineers, American Institute of Mining & Metallurgical Engineers, American Society of Civil Engineers, American Society of Mechanical Engineers, American Society for Testing Materials, Electrical Manufacturers' Council, Electric Light & Power Group, Fire Protection Group, Gas Group, National Safety Council, Society of Automotive Engineers, and the United States Departments of Agriculture, the Interior, the Navy and War.

In the report the functions of the committee are stated to be: To unify methods of arriving at engineering standards; to secure co-operation among various interested organizations in order to prevent duplication of work and promulgation of conflicting standards, but not itself formulate standards; to act as an authoritative channel of co-operation in international engineering standardization; to promote in foreign countries a knowledge of American engineering standards; to collect and classify data on standards, and to act as a bureau of information regarding standardization.

The committee has now been actively at work for more than a year, although much of the time and effort so far have necessarily been spent on laying a basis for work. Prior to Dec. 31, 1920, three standards were approved, these bearing respectively the numbers 1, 2 and 3. Specifications and tests for portland cement were approved as "tentative American standards"; specifications for fire tests of material and construction were similarly approved, and certain pipe threads were approved as "American standard."

Several standards were submitted for approval, but had not been acted upon prior to the above date, as follows: As "American standard," the National Electrical Code; as "tentative American standards," a standard test for toughness of rock, a standard method for distillation of bituminous material suitable for road treatment; a standard method for sampling coal; specifications and tests for portland cement; and as "recommended American practice," safety code for head and eye protection. A large number of projects for which sponsorships have been arranged are under way, including such items as rating of electrical machinery, ball bearings, gears, machine tools, nuts and bolt heads, pipe flanges and fittings, screw threads, castings, various safety codes, etc.

The American Engineering Standards Committee, usually referred to as the main committee, composed of forty-seven members, is solely an administrative and policy-forming body and does not concern itself with technical details. Each industry, or branch of industry, is wholly autonomous in its standardization work, the function of the main committee being merely to assure that each body or group concerned in a standard shall have an opportunity to participate in its formulation, which is in the hands of a working committee, technically called a "sectional committee," made up of representatives designated by the various bodies interested, together with other specifically qualified individuals. The main committee must approve the personnel of each sectional committee as being authoritative and adequately representative of the various interests concerned.

Each sectional committee is organized by, and is under the leadership of, one or more of the principal bodies interested. Such bodies are known as "sponsors." The committee has decided that if it is the desire of any industry to have a general committee, representative of the industry as a whole, as a means of developing and correlating the standardization work of the industry that arrangement will be eminently satisfactory.

As to publication of the standards, individual standards are published by the sponsor bodies, but provision is made for the publication collectively of standards approved by the committee and also for the original publication of individual standards upon request or approval of the sponsor bodies. The committee acts as distributing agent for all standards approved by it, or which have been submitted to it for approval.

At present the work is supported by the dues of the member bodies, $500 for each representative on the main committee. Exception is made in the case of government departments, pending the enactment by Congress of legislation which is necessary to enable the departments to contribute their share of the expenses of the committee. As the present dues are not sufficient to support and develop the work the committee will seek contributions from industrial associations and companies interested in standardization.

It is planned that the committee office shall serve as a bureau of information on engineering standardization, keeping in touch with what is going on in connection with this subject, both in America and abroad.

The American Society of Mechanical Engineers is engaged upon a revision and enlargement of its power test codes issued in 1915. Nineteen codes are being drafted to cover all classes of power plant machinery. Nineteen committees are engaged, supervised by a main committee of twenty-eight, of which Fred R. Low of New York, editor of *Power*, is chairman, and Prof. Clifford B. LePage of Stevens Institute of Technology, Hoboken, is secretary.

Why Alter the Standard Safety-Car Design?

Advantages and Disadvantages of Double-Door Type of Construction with Longer Platforms Are Discussed and Data Are Given Regarding Power Consumption and Passenger Interchange Time.

BY J. C. THIRLWALL
Railway and Traction Engineering Department, General Electric Company, Schenectady, N. Y.

A NUMBER of articles and letters have recently appeared in the ELECTRIC RAILWAY JOURNAL discussing at considerable length the desirability of changes in the design of the standard safety cars. Some operators seem to feel that double doors, permitting simultaneous entrance and exit, are necessary, and that a wider aisle is desirable. Apparently the thought behind these suggestions is that the use of a double-door car with bigger platform and aisle space will result in a better schedule through a shortening of the time of passenger interchange. Other operators vigorously dispute this claim, including one, at least, who has made the experiment, and who now uses but one of the two doors with which his one-man cars are equipped.

There is unquestionably a feeling of irritation produced in the minds of passengers waiting to board a car, if they are held up twenty or thirty seconds while fifteen or twenty people are leaving a single-door car, particularly in rainy weather, and actual complaints from such people or the fear that such complaints would occur have without doubt influenced those operators who have insisted on changes in the standard design and dimensions. For points of heavy interchange, particularly on streets where several lines operate in common and headways are extremely short, the theory of the simultaneous egress and entrance of passengers is alluring, and the temptation is strong to increase the standing space so as more comfortably to handle rush-hour crowds. But the actual effect of such changes, in spite of the Madison experience, is problematical, and they do involve penalties which are not at all problematical.

INCREASED WEIGHT WILL REQUIRE LARGER MOTORS

The essential features of the original Birney design were the dimensions of the body, the use of a low-wheel, long wheelbase truck, and the elimination of every pound of unnecessary weight. Some strengthening of structural parts was found desirable after the first cars had been tried out in service. Northern cities had to use more heaters than those in the South, and more interior sheathing, and required 26-in. wheels instead of 24-in. wheels to provide winter clearances. But minor changes such as these have not altered the fundamental design, although they have increased the weight considerably above what it was at first, and that thereby increased first costs and decreased the schedule possibilities. But the car builders can still build in quantity for stock and give the industry the benefit of the economies of production.

But if the car bodies are to be lengthened and widened to varying degrees, the trucks may have to be changed to conform and weights may easily increase to a point where larger-size motors will be required to meet heavy service in the larger cities. Under these conditions, standardization and quantity production will be impossible; prices will inevitably increase, and the sale of cars on car trust certificates will be impracticable.

So much for the general objections to fundamental changes; now for the specific ones. According to the article in the March 12, 1921, issue of the ELECTRIC RAILWAY JOURNAL, the double-door cars in Madison weigh 2,600 lb. more than the standard cars originally used there, and it costs real money to carry around this extra weight. Energy consumption goes up almost in direct proportion to the tons moved, maintenance of equipment and of track are both increased and where we used to say "5 cents per pound per year," we can today say that for many roads it costs 10 cents a year for every pound of weight in their regularly used cars.

Of these items, power is the largest and the one that can be figured the closest. Data recently compiled by the American Electric Railway Association giving statistics on power costs from representative railway power stations show that for ten large plants ranging from 15,000 to 87,000 kw. in capacity the average operating cost per kilowatt-hour is 1.08 cents. Twelve smaller stations of from 4,500 to 13,000-kw. capacity show an average cost of 1.62 cents. These figures do not include fixed charges.

Repeated tests of safety cars in frequent-stop city service indicate an average motive-power consumption of 140 watt-hours per ton mile (including passenger load) at the car, or about 200 watt-hours at the alternating-current switchboard in the power station. Figures compiled by the writer, and presented in an article published in the Oct. 2, 1920, issue of the ELECTRIC RAILWAY JOURNAL, covering 1,255 safety cars operated by thirty-eight railways, showed an average annual mileage per car owned of 42,500. The annual energy consumption, on this mileage figure, per ton of weight would be 0.2 × 42,500 or 8,500 kw.-hr., or 4.25 kw.-hr. per pound. At the lower cost in the above figures, each pound of weight in the cars costs 4.6 cents per year for power; at the higher rate, which is nearer the average, I believe, it costs 6.8 cents per pound per year.

The effect of weight on track and equipment maintenance is more difficult to determine. Obviously with light cars, the special trackwork, rails and joints will last longer and tie spacing can be increased, and, with any given truck and motors, the lighter the body the longer the life of wheels, axles, truck members, brake shoes and motor insulation. The longer and wider the body, the more it costs to repaint it and to make the ordinary running repairs.

OPERATING COSTS ANALYZED

We know fairly accurately the average operating costs of the standard safety cars. Twelve companies operating over 400 safety cars averaged in 1920 1.6 cents per car-mile on their safety-car lines for maintenance of way and structure, and for equipment maintenance, 1.7 cents. Of the first figure, probably at least one-fourth, or 0.4 cent, covers items that would be directly affected by car weights; of the latter, fully one-half, or 0.85 cent, would be affected by the weight and size of body. The total of these items, or 1.25 cents, is the weight factor per car-mile of the standard safety cars on these twelve properties. The weight of these cars with average load is about 17,000 lb., so that with an annual mileage of 42,500, as previously assumed, the cost per pound is (1.25 × 42,500) ÷ 17,000 = 3.1 cents. This cost, of course, will vary, depending on many factors, but probably on few roads would it be less than 2 cents, while on many it would be 4 cents.

The total cost, therefore, for power and maintenance is at least 7 cents per pound per year, and may be 10 cents. A fair average would be about 8.5 cents; so the 2,600 lb. of additional weight will add about $200 a year to the operating costs. Fixed charges on the $600 extra first cost of the car will add another $100 annually, making the total penalty $300 on an average.

If a materially faster schedule could be made as a result of these changes, this extra cost might be justified, but the man who expects such a result is very apt to be disappointed. The following records have been published during the past four months by the American Electric Railway Association, comparing speed of passenger interchange on safety cars and on two-man prepayment types:

	Seconds per Passenger Interchange	
	Two-man Cars	Safety Cars
Denver, Col.	2.75	....
Baltimore, Md.	2.31	2.64
San Antonio, Tex.	2.93	3.14
Charleston, S. C.	2.60	3.40
Portland, Ore.	2.97	3.61
Trenton, N. J.	1.70	1.84
Average	2.54	2.93

The records above were all taken by the operating companies, excepting those in Trention, which were made by inspectors of the New Jersey Public Utilities Commission. They show an average difference per passenger of but 0.4 second in favor of the double-door, two-man cars, or a total of 0.8 second per passenger per trip. In other words, in handling seventy-five passengers per hour, the total duration of stops would be only one minute longer than on a two-door, two-man car. But certainly a part of this extra time is due to one-man operation rather than to interference between entering and leaving passengers. As a matter of fact, the Public Utilities Commission report on safety-car operation in Trenton indicates that only about 5 per cent of the total time of passenger stops was occasioned by passengers leaving when others were waiting to board the car. Every one familiar with traffic conditions knows that at most stops passengers board or passengers alight, but there is no interchange, or simultaneous boarding and alighting. So it is safe to say that of the one minute per hour excess time of the safety car, not more than 15 or 20 seconds could possibly be saved by a double door of wider aisle. And, further, the extra weight of these features slows down the free-running speed of the car and decreases the rate of acceleration to such an extent that the resulting schedule speed is much more apt to be reduced than increased. With the present size motors, a 15,000-lb. car with a fifty-passenger load can be safely accelerated at only about 1.5 m.p.h.p.s., the minimum rate for normal schedules. Cars weighing 17,200 to 17,500 lb., as do the Madison and Lancaster cars, or 19,000 lb. as do those in Logansport, must either accelerate more slowly than is desirable or must overload the motors, with consequent increase in maintenance cost and failures, and if still heavier passenger loads are permitted, as often occurs, this condition is still further aggravated. In other words, for general service and normal schedules in the larger cities, the standard safety car weight is about as great as the present 25-hp. motors are capable of handling; any further increase in body weights will, in many cases, call for larger motors with a material increase in first cost, and in total weight of car.

Therefore, in so far as expediting the handling of traffic is concerned, there would be no advantage in changing the present body dimensions or seating arrangement. There may be in some localities a prejudice against one-man operation, or against single-truck cars, that leads to criticisms of the loading arrangement and aisle width of the standard safety car, and which can be placated by the suggested changes. But it must be remembered that in the past five years there have been built and put into service some 4,000 one-man cars of the Birney design, and fewer than 100 that have had the changes previously discussed, and in only one case has a company previously using the standard car found it necessary to make the changes in subsequent purchases.

Economical Painting for Safety Cars

A Three-Coat System of Painting Has Been Worked Out for the Safety Cars in Trenton, N. J., Which Apparently Has a Satisfactory Life and at the Same Time a Low First Cost

By H. E. Krouse
Master Mechanic Trenton & Mercer County Traction Corporation, Trenton, N. J.

After several experiments the officials of the Trenton & Mercer County Traction Corporation feel that they have solved their problems for refinishing twenty one-man safety cars which that company has in service. The system adopted reduces to a minimum the shopping time, as well as the necessary labor and material, and based on the results of an inspection of cars which have now been in service for the past six months it appears that a satisfactory life will be obtained at a very low first cost.

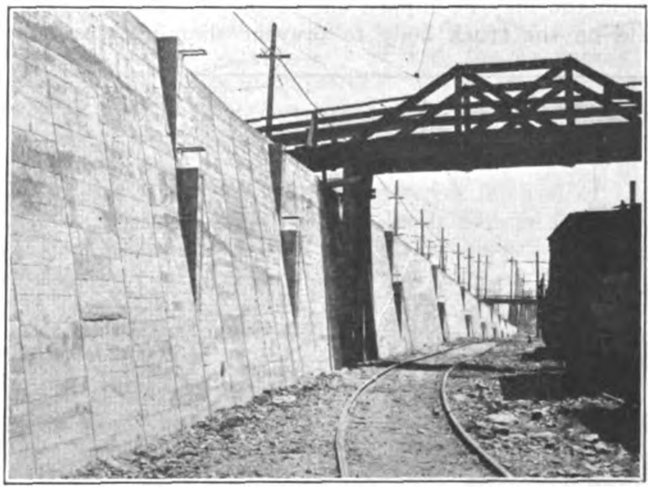
The painting system that is now being used consists of first scrubbing the car body with soft soap and water and then sanding it down. No extensive priming coat is used, but the spots of the car at points where the paint is entirely gone is covered with a metal primer. A coat of lead, tinted to correspond closely to the general car colors, is next applied. This actually constitutes the first coat and is the preparation coat for receiving the finishing enamel. Next a coat of long oil finishing enamel is applied and the numbering, striping and lettering are then completed. Striping has been almost entirely eliminated. The final coat consists of finishing varnish, which is applied over the enamel.

The application of this last coat of varnish over the oil enamel having a semi-gloss is somewhat of a departure from the established practice of this road, and is not considered a necessity. However, it has been found through a test covering ten months of service that by adding a coat of high-grade finishing varnish over the enamel where this short system of painting is used the general condition of the car is improved and a much longer service is obtained. By the use of this three-coat system the shopping time of cars has been reduced from one-third to one-half of that originally found necessary, and a substantial saving in both material and labor has been effected. Results thus far have been so satisfactory with this system that plans are being made to refinish forty more cars of the one-man type and ten 44-ft. steel cars of another type with this method in connection with the painting schedule for the coming year. Railways are practicing economies in all directions during these times of high prices and painting offers a fruitful field for economical methods.

Trolley Pole Support Built Into Retaining Wall

To provide permanent and substantial supports for trolley poles along the Army Street retaining wall in San Francisco the city built into the wall at the time of its construction concrete steps and steel bar loops as shown in the accompanying illustration. The poles carry telephone wires, feeders and the trolley wire for tracks of the United Railroads in the street behind the retaining wall.

The steps built to support the poles are 2 ft. wide and 1 ft. 4 in. in length. The bars are 1¼ in. in diameter, the first one located 1 ft. above the step and the second 6½ ft. above it, or 6 in. below the top of the riser or shoulder of concrete that extends vertically above the step. The 1¼-in. bars extend almost through the retaining wall and hook into a grillage of reinforcing bars in a vertical plane. The loops are 13 in. square inside. When the pole has been placed it is wedged firmly against the concrete by shims driven in around the loops.



STEPS AND LOOPS FOR SUPPORTING TROLLEY POLES

"Through Bolt" Housings

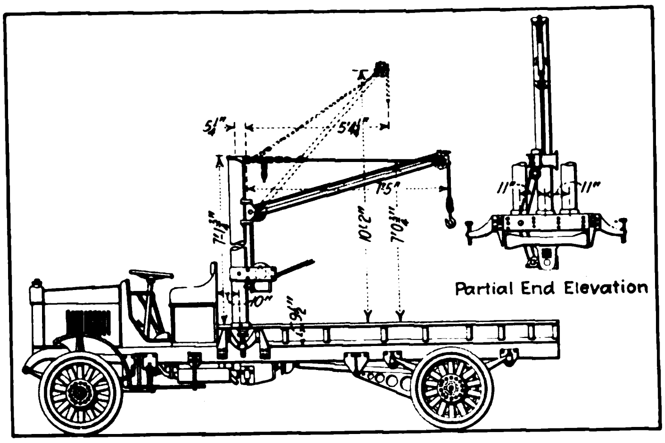
Loose housings have been the source of many of the troubles experienced with split frame railway motors. Early motors were built with housings held in the frame by tap bolts which screwed into tapped holes in the housing. Considerable trouble was experienced with these housings due primarily to the stretching of bolts holding the frame together. This caused the clamping action on the housings to be released and resulted in loose housings. The loose housings caused the tap bolts to work loose in the tapped holes. This condition was difficult to remedy and the repair could be only temporary.

Recently, the split frame motors of the Westinghouse Electric & Manufacturing Company have been so designed that the housing is fastened to the frame by through bolts, which are held tight by steel nuts. When the nuts wear loose, the remedy is simple and inexpensive: throw the nut away and use a new one. The old housing is known as the "tap bolt" type, while the new design is termed a "through bolt" housing. Through bolt housings have been supplied not only on the more recent designs of split-frame railway motors but also to replace the tap bolt housings on many of the older motors.

When the housing seat is badly worn, it has been found that the most satisfactory way to repair is to rebore the frame to a larger size and supply a housing to suit. The Westinghouse company has also developed an "oversize" housing in order to care for this method of repair.

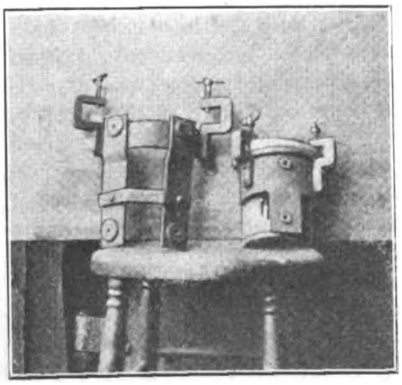
Truck Crane to Reduce Loading Time

THE Meade-Morrison Manufacturing Company, East Boston, Mass., is marketing a truck crane of 1-ton capacity which may be applied readily to any standard truck. The equipment consists of an upright steel column, a boom with fastenings, a base with cross channels, outrigger leveling screws and a winch with brackets. When the chain has been unshackled, the boom end may be slipped out of the slot and the boom laid on the truck body to prevent slapping when the truck is in motion. If it is desired to use the truck on work not requiring a winch the mast or column may be unpinned and lifted out of the base castings and the entire base may be covered by temporary flooring. With the column and winch in the usual position, loads may be pulled up over the rear of the truck by direct pull from the winch, without the use of the boom.



REMOVABLE TRUCK CRANE

Jig Facilitates Drilling of Bearings

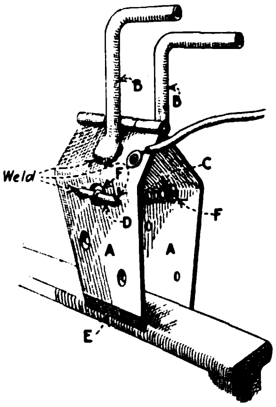


BEARING JIGS FOR LOCATING DOWEL PIN HOLES

THE accompanying picture shows a jig used in the shops of the Des Moines (Iowa) City Railway for locating the dowel pin holes in axle bearings. The bearing to be drilled is merely tightened up in the jig with the two screws shown and a drill run down through the holes provided in the jig. This scheme assures the accurate location of the dowel pin holes and the jig may be placed in position and removed very quickly. It is necessary to have a different jig for each class of bearings, and care must be taken to see that the jigs are made to fit perfect bearings to start with, otherwise inaccuracies result.

Handy Ground Clamp for Electric Welding

THE accompanying illustration shows a form of ground clamp used by the Easton Transit Company for attaching ground wires to electric welders, grinders and other apparatus used on the lines. It has been found of great convenience and its simple construction makes it available for use by any railway.



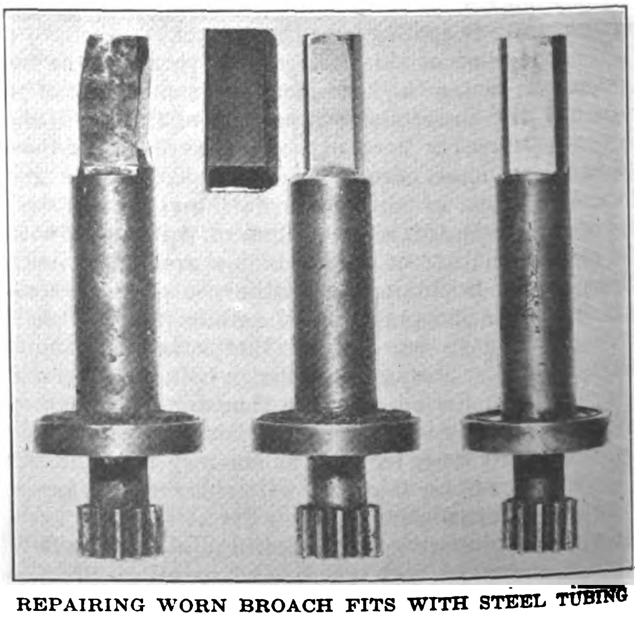
GROUND CLAMP MADE FROM HINGE

The clamp is made from an ordinary strap hinge bent as shown. Two ¾-in. holes are drilled at *F*, and a K-10 controller spring is passed through these and is held in place by two ⅜-in. rods welded in place. The ends of the hinge are cut off and sharpened at *E* and suitable handles made of ⅜-in. iron pipe are shaped and welded to the upper portion of the hinge. If it is desired to insulate these handles a piece of rubber hose may be slipped over them. The wire which forms the electrical connection is attached to the hinge by a ¼-in. stove bolt and washer.

This form of clamp can be quickly applied to and removed from almost any part of the track or special work, and it has been found especially valuable in paved streets, as its construction permits of its use in a very small crevice along the rail. When not in use the clamp is used to hold the coils of line or ground wire to some part of the machine and it thus helps to stow away the wire in good condition.

Steel Sleeves for Broached Shafts

THE use of drawn steel sleeves in repairing the handle fits of controller shafts and brake valve stems enables this work to be done at a very small percentage of the cost that new parts would cost. D. B. Flower, distributer of electric railway accessories, Philadelphia, is furnishing steel sleeves in any size necessary to fit the various broaches of controller handles and brake valve handles. The method of repairing



REPAIRING WORN BROACH FITS WITH STEEL TUBING the worn fits is shown in the accompanying illustration. The illustration at the left shows a worn stem before repairs have been started. This is machined, as shown in the center illustration, to such a size that the steel tubing will form a tight fit when forced on to the stem. The illustration at the right shows the completed job.

Letter to the Editors

Labor Bureau Statistics Are Weighted

CITY OF PHILADELPHIA
DEPARTMENT OF CITY TRANSIT, VALUATION DIVISION
PHILADELPHIA, PA., April 5, 1921.

To the Editors:

I note on page 629 of your issue of April 2, a statement that the index price of the U. S. Bureau of Labor statistics is an unweighted average.

You will find by referring to the U. S. Monthly Labor Review or to Bulletin No. 226 or No. 269 of the Labor Department that this index price is weighted in accordance with the census statistics for each important commodity. The bureau states very clearly that the index number assigns "to each commodity an influence proportioned to its importance in the country's markets."

The best statisticians regard the Bureau of Labor index prices as the best weighted and most generally satisfactory of any available in this country, and in view of the widespread public interest today in index prices and index wages, the writer ventures to suggest that you publish this correction in an early issue.

E. E. GEORGE.

[EDITORS' NOTE.—Mr. George's letter was submitted to J. F. Layng, the author of the article referred to, who has explained that Mr. George is correct as to the weighted character of the data given in the reports of the Bureau of Labor Statistics. The reference made by Mr. Layng to non-weighting was due to the statement, included in earlier bulletins, to the effect that products were so selected as to be "self-weighting." Later reports have been based on weighted data.]

Association News

Building and Structures Committee Meets at Columbus

THE Engineering Association buildings and structures committee met at the Deschler Hotel, Columbus, Ohio, on April 2, 1921. Those present were D. E. Crouse, Rochester & Syracuse Railroad, chairman; N. E. Drexler, Newport News & Hampton Railway, Gas & Electric Company; J. R. McKay, Indiana Service Corporation, and S. J. Steiner, Aurora, Elgin & Chicago Railroad.

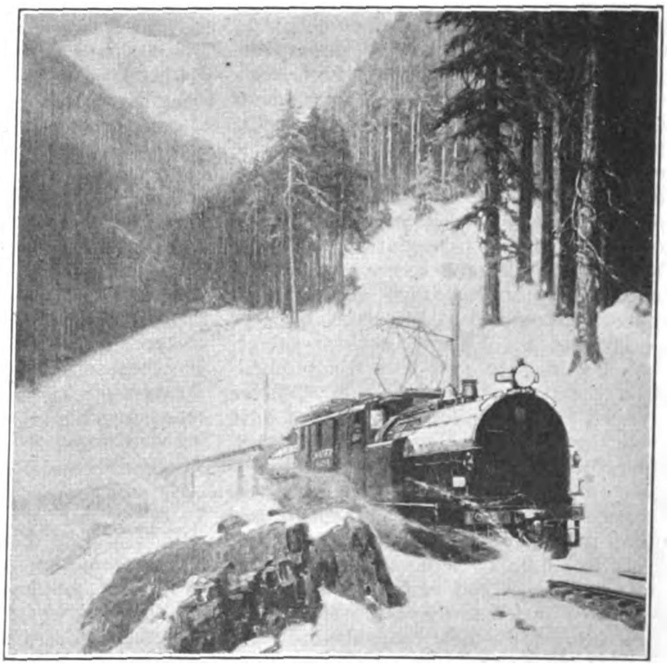
The subcommittee on the design of a typical shop building reported the results of its two meetings with the equipment committee's subcommittee on this subject, and the various details of shop equipment layout and building were thoroughly discussed. The chairman of this subcommittee will have a tentative shop layout and plan ready to present at the next equipment committee meeting, scheduled to be held early in May.

The subcommittee which is co-operating with the way committee on the subject of wood preservation discussed this subject as it relates to the treatment of structural timber and piling and also presented data and photographs of treated timber, indicating the value of preservative treatment. A joint questionnaire on this subject has been issued and the subcommittee will make a further report after studying and summarizing the replies.

In connection with the subject of prepayment and postpayment fare collection at terminals, many plans for both were studied. Plans were laid for an early subcommittee meeting to be held with the Transportation & Traffic Association, so that a form of letter may be drafted to obtain from member companies information regarding this form of fare collection.

More than 125 members are now on the roll of the Camden company section of the Public Service Railway, an increase of more than 100 since the organization meeting.

Milwaukee Locomotive in Fine Art



OIL PAINTING BY SCHENECTADY ARTIST RECENTLY FEATURED IN ART EXHIBITION IN NEW YORK CITY

AN OIL painting of a winter scene on the Cascade division of the Chicago, Milwaukee & St. Paul Railroad, featuring one of the new General Electric passenger locomotives, was shown at a recent exhibition of the National Art Club in New York Ctiy. The painting is by Walter L. Greene of Schenectady, N. Y., the artist who painted the picture of the United States battleship *New Mexico*, recently presented to the Navy Department by E. W. Rice, Jr., president of the General Electric Company.

Mr. Greene is an American by birth, but secured his advanced art training in France and has exhibited at French and Belgian salons, as well as in this country. He is a member of the Boston Art Club.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Blanket Franchise Urged

Railway at Richmond Regards This as Necessary to Carry Out New Financing

The Virginia Railway & Power Company announces the following result of the recent valuation of its Richmond lines made by Stone & Webster as a basis for discussion of a proposed new franchise:

Money put into Richmond Railway system, including interest, less actual return	$20,249,400
Value of property, based on inventory, at average prices of 1914-1920	12,488,841
Difference	$ 7,760,559

The company is asking a return only on the inventory value in the proposed new franchise now pending before the committee on streets of the City Council.

The above relates to railway property entirely and does not include property in Richmond operated under the company's light and power franchise.

E. Randolph Williams, vice-president and general counsel, recently made public the total value of the property of the company as computed by Stone & Webster as of June, 1920. In an address before the Richmond Chapter of the American Association of Engineers Mr. Williams asserted that the entire Virginia holdings of the company were valued at $49,000,000.

Thomas S. Wheelwright, president, has declined to give out for publication the text of the Stone & Webster report, though an abstract of that part relating to the railway lines in Richmond is being used before the committee on streets in connection with the discussions of a new franchise, and that part relating to the lines in Norfolk is similarly being used before the city manager and commission of that city in relation to discussion also pending there for a new franchise.

The company operates now under a number of franchises. Of the two base franchises in Richmond that granted to the Richmond Traction Company expires in 1926 and that granted to the old Richmond Railway & Electric Company expires in 1929. With one of its important base franchises now having less than five years to run, the company is finding it difficult to raise money for needed improvements and extensions and is pressing consideration of a new blanket franchise for Richmond.

Officials of the company have informed Mayor Ainslie that while the road is making some money at the present 6-cent fare, the lack of any credit makes it necessary to pay for all improvements out of earnings, and for that reason track replacement where streets are to be paved can only proceed as the company can afford to pay for the work from its daily earnings.

Wage Cut Results in One-Day Strike

Employees of the Orange County Traction Company, Newburgh, N. Y., have accepted a reduction in wages, but not until the road had been tied up for a day by a strike. The company had a contract with its men expiring on May 1 at the following rates of pay: one-man operators, 53 cents an hour and two-man work, 48 cents an hour. In conferences with the men officers of the company advised that it was necessary for the next year that wages be lowered 10 per cent, and that the rates for one-man operators would be 48 cents an hour and two-man 43 cents an hour. The men were told that these rates would be effective from April 10. The men insisted on retaining the old rate of pay for the succeeding year, and refused to operate the cars on April 10 at the new rate. In consequence the company operated no cars on that day. Through the intervention of Major McKay, City Manager, several conferences were held between officials of the company and its employees and settlement was made at the following rate: 43 cents an hour for two-man work and 50 cents an hour for one-man work. A straight decrease of 10 per cent was made on all other departments. Service was suspended only one day.

Present Columbus Wages Continued

No reduction will be made in the wages of employees of the Columbus Railway, Power & Light Company, Columbus, Ohio, although the agreement expired on March 31 that was reached through the board of arbitration after the strike of 1919.

The announcement that no cut in wages is contemplated was made by Norman McD. Crawford, vice-president of the company. The statement issued by Mr. Crawford shows that the payroll for the year 1920 exceeded $4,500,000. The statement declares:

> Facing as we are a nation-wide business depression and the knowledge that, without exception, all business interests are either reducing wages or reducing forces, or both, it must be evident to you that this company cannot continue to be the exception unless we are able to face the prevailing condition with each individual achieving maximum efficiency, not only in production but also in loyalty united with watchfulness in the interest of the company, and undivided determination to achieve 100 per cent efficiency.

Utility Bill Protested

Ohio Companies Contend Governor's Proposal Would Make Figureheads of Commissioners

Public utilities corporations of Ohio are up in arms over the administrative reorganization bill, sponsored and submitted by Governor Davis and now pending in the General Assembly. They object to the reorganization scheme as it applies to the State Public Utilities Commission and its proposed future status. The House passed the bill and messaged it to the Senate.

PROGRAM PROTECTED

Spokesmen for the steam and electric railways and the power and light companies appeared before the Senate reorganization committee during the week ended April 2, and made emphatic protest against the provision transferring the executive work of the State Public Utilities Commission from it to the director of the proposed department of commerce. They told the committee that this change will make the utilities commissioners mere figureheads and will center too much power in the hands of the Governor, who is to name the director of this and other proposed departments.

A strong plea was made that the bill be amended to allow the commission to retain the power and authority to name all its experts and other officials. As the bill was prepared by the Governor's experts all control over the executive department of the commission is taken away and the commissioners are merely retained to exercise quasi-judicial powers, and to pass on rate cases.

As the result of the protests lodged with the committee by the representatives of the utilities the committee has incorporated amendments which make concessions, but do not accede to the wish of the corporations that the utilities commission be left in its present status and with its present powers.

AMENDMENT TO BILL URGED

The amendments, instead of taking away all the administrative powers of the commission and its right to name its subordinates, provide that the director of commerce shall serve as secretary to the commission. It is hoped that this change will meet with the approval of the public utilities companies.

It was expected that the reorganzation bill would come up for passage during the week ended April 9, after which, in the event the Senate passes the measure it must be sent back to the House for concurrence by that body.

New Orleans Conference

City Insisted on $35,000,000 Valuation for Railway—Bankers Dismayed at Prospects

A very important executive conference attended by J. D. O'Keefe, receiver of the New Orleans Railway & Light Company, Judge Rufus E. Foster of the United States District Court, and visiting Eastern Bankers was held at New Orleans on April 6 in order to map out a definite plan for the solution of the traction troubles of New Orleans.

The Mayor appears to be inflexible in his determination to adhere to the plan of the City Council setting forth fourteen points which it regards as essential for acceptance by the company if the matter is to be settled. One of these fixes the valuation of the property at not more than $35,000,000, with a yearly return of $2,150,000, and al--lowing a further increase in the valuation of $5,000,000 for new money. On this new money a return of 7½ per cent would be allowed, whereas the return on the valuation the city is willing to allow would be 6.14 per cent.

Other conditions covered are that the Commission Council shall approve all undivided profits and securities issued, and that salaries shall be limited, track standardized, etc.

Mr. Dahl, one of the visiting financiers, had consented to accept the property valuation of $44,700,000 placed upon it by the citizens' advisory committee and a rate of return of 7 per cent. He announced on behalf of himself and the visiting bankers, when the proposed plan was submitted by the acting Mayor, that further negotiations were useless. The conference thereupon came to an abrupt end. This valuation of $44,700,000 had been approved by Receiver O'Keefe and Judge Foster.

Harold W. Newman, president of the New Orleans Stock Exchange, a member of the committee, in speaking of the decision reached by the City Commissioners, declared that the "fourteen" points are so inconceivable as to destroy the banking credit of the company.

If the Council passes the 7½-cent ticket ordinance, Receiver O'Keefe said he would refuse to accept that fare and warned the public that if the rate of fare was made to revert to 5 cents the street cars would not be taken out.

Service-at-Cost Legislation Approved

Upon recommendation of its legislative committee the Milwaukee City Council at its meeting on April 4 approved a bill to be introduced in the State Legislature authorizing the city to enter into a service-at-cost agreement with the Milwaukee Electric Railway & Light Company. The legislation has been asked by the public-utilities acquisition committee, appointed to investigate the feasibility and desirability of municipal ownership of the electric railway and electric light and power facilities of Milwaukee.

The bill is intended to give the city of Milwaukee power to carry out the recommendations which the public utilities acquisition committee is expected to make in a report to be submitted in the very near future. The bill provides for the usual service-at-cost agreement plus a feature which will make it possible for the city gradually to become the owner of the utility property. The company, under the proposed service-at-cost agreement, would be removed from the jurisdiction of the State Railroad Commission except in certain minor matters. Under the plan the city will also extend its credit to the company to finance extensions and improvements at a lower rate of interest than the company now has to pay.

Operating Proposal Transmitted to Council

Mayor Moore of Philadelphia, Pa., has transmitted to City Council the proposed form of agreement providing for the leasing of the city-owned Frankford Elevated Railway and Bustleton lines to the Philadelphia Rapid Transit Company for operation. Accompanying the draft of the proposed agreement was a message from the Mayor to Council, giving an outline of its provisions. It was referred without debate to the committee on transportation. Among the more important terms of the lease are these:

The Rapid Transit Company is to operate the lines and pay the city annually a return of 5 per cent on the amount invested in the property, which now amounts to about $15,000,000.

The lease is to expire July 1, 1957. There is, however, also a provision that the lease "shall absolutely cease and determine without further notice six months after the date of the final adjudication of the valuation of the properties operated by the company, including the lines leased hereunder now pending before the Public Service Commission."

The city also reserves the right at any time after five years from the date of the agreement, during the term of the agreement, to terminate it after giving the company six months' notice.

The company is to supply two of the three power stations and to equip and operate the Bustleton surface line.

The company is required to furnish "safe and reasonably adequate accommodations to the public."

The city is to supply a maximum of 100 cars (50 of these have already been ordered). It shall also supply a substation of about 4,000 kw. capacity, located at Front Street and Fairmount Avenue.

The company is to be liable for any damage claims, excepting such as result from any defect in the property that may exist prior to May 1.

The payment of rentals to the city is to have precedence over the payment of dividends on Philadephia Rapid Transit stock.

Buffalo Cuts Wages

All Unskilled Labor Included in Retrenchment — One-Man Car Operators Only Trainmen Included

Reductions in basic wages affecting all classes of unskilled employees except platform men are announced by the International Railway, Buffalo, N. Y., effective on May 1. The pay of unskilled laborers, boosted during the war by the War Labor Board to an abnormal sum as compared with wages of skilled employees, will be equalized by the new scale announced by President Herbert G. Tulley.

In a statement to employees explaining the new scale, President Tulley says that for the year 1920 the company fell short by more than $1,000,000 of earning a fair return upon the value of its property devoted to public service, according to the formula adopted by the Public Service Commission when the 7-cent fare, with four tickets for a quarter was granted.

The situation as far as 1921 is concerned is even worse, Mr. Tulley says, with the result that for the months of January and February the company failed by $300,000 to earn the amount required. This is occasioned by the industrial depression, which has been so acute that at the present time the gross receipts show a falling off of 17 per cent. Mr. Tulley said:

> At this time the management does not intend to change the basic rate of its motormen and conductors, or of its skilled employees. The abnormal rates of wage paid some classes of unskilled employees must be adjusted and certain costly working conditions must be corrected. The maximum rate of trainmen has been increased 75 per cent since May 31, 1918, while wages of certain classes of unskilled employees, such as curve cleaners, watchmen, bridgemen, helpers, car cleaners, etc., have been increased an average of 100 per cent and in some cases as high as 200 per cent.

$100,000 PAID FOR UNPRODUCTIVE TIME

President Tulley points out that last year the International paid to trainmen more than $100,000 for time during which no work was performed, exclusive of layover time. He says that "payments for which no service is rendered cannot be justified and cannot be continued, consequently a new set of working conditions eliminating such payments will become effective on May 1, 1921. Compensation for loss of time when taking the nine hours' rest period will be discontinued under the new rules and only such guarantees, allowances or special compensations as are provided in the new working conditions will be paid after May 1."

The local lines of the International in the city of Lockport last year did not earn operating expenses. Under these circumstances President Tulley explains that the company is not justified in continuing payment of the 5 cents extra compensation for the operation of one-man cars in that city. Effective May 1, trainmen in Lockport will be paid the same scale as those in Buffalo, 55, 58 and 60 cents an hour.

"The rates of pay of all other employees except those listed will for the present be continued unchanged," the statement says.

The International Railway says it makes no guarantee of the continuance of these rates for unskilled workers and that its ability to maintain them is dependent upon an improvement in the revenue of the company and the extent to which the employees co-operate with the management in its efforts to operate the property efficiently and economically.

The changes in rates per hour effective May 1 are as follows:

Auto washers, 40 cents an hour.
Bridge agents, 45 cents an hour.
Car cleaners, 40 cents an hour.
Car cleaners foreman, 45 cents an hour.
Curve cleaners, 40 cents an hour.
Drillhands, 50 cents an hour.
Firemen shops and carhouses, 40 cents an hour.
Freight truckers, 45 cents an hour.
Helpers, mechanical department (all classes), 45 cents an hour.
Janitors, 40 cents an hour.
Laborers, 40 cents an hour.
Sandmen, 40 cents an hour.
Scrubbers (paint shop), 50 cents an hour.
Scrubbers (foreman), 54½ cents an hour.
Shifters, 45 cents an hour.
Stoveman, 40 cents an hour.
Storeroom laborers, 40 cents an hour.
Sweepers, 40 cents an hour.
Watchmen, 40 cents an hour.
Trainmen employed on trolley express, flat and work cars will be paid the same rate as trainmen in the passenger service, viz: 55, 58 and 60 cents an hour.
Trainmen operating "one-man" cars in Lockport, 55, 58 and 60 cents an hour.

City of Chicago Still Obdurate

Checks for a total of $3,590,616 were refused by the city of Chicago on April 9. Tender of this amount was made by the Chicago Surface Lines in payment of the city's share of transportation revenue for the two years preceding Jan. 31, 1921. This is what is known as the city's 55 per cent of net revenue. The city contends that the ordinances under which these payments are made have been abrogated by the companies in allowing rates of fare to be increased. Last year the "55 per cent" amounted to $1,448,848, while this year it totaled $2,138,383. There was also an amount due from the companies in the matter of the adjustment of certain claims.

Mayor Thompson evidently has been forced by public sentiment to accept certain amendments to the transportation measures which are awaiting action by the State Legislature. Radical changes were made in the proposed bill at the last minute, and it will be called up for action in the near future. Originally the Mayor saw insurmountable obstacles in a suggestion that the elevated roads be included in the plan for a "transportation district." It is now intended to make it possible for the city to acquire these properties as part of the general plan.

A more important change is in a provision that the trustees under the act may raise fares above 5 cents in order to cover costs of operation. Other proposed amendments would put all employees of the district except the highest executives under civil service and would call for a referendum on bond issues.

New Wage Draft Presented

Important Changes, Including Wage Reduction, Are Outlined by Eastern Massachusetts Street Railway

The joint conference board of the union of employees of the Eastern Massachusetts Street Railway has been handed a draft of a proposed agreement prepared by the public trustees of the company and has been asked to submit the agreement to the local unions throughout the Bay State System for approval. The company announced on Feb. 25, that it would reduce wages 20 per cent effective May 2, 1921.

The new agreement is to be made for one year beginning May 2, 1921. In it the trustees state that the company will do nothing to prevent any employee from becoming or continuing to be a member of the union and will not in any way discriminate against a member thereof because of such membership.

A new provision of the proposed agreement submitted by the trustees is that all regular employees shall be provided without expense or medical examination, with group life insurance similar to that now enjoyed by the supervisory force. The amounts of this group insurance range from $500 for employees in the service one year to $2,000 for employees in the service for ten years or more. These policies are to be issued to the employees without cost to them.

Old Wage Scale to Be Restored

Wages will be restored to the scale in effect prior to May 1, 1920, namely 46, 48 and 51 cents an hour. Operators of one-man cars will receive 56 cents an hour. Instructors will continue to receive 4 cents an hour in addition to their regular pay. The working day of conductors and motormen and so-called miscellaneous employees will be nine hours. The company will no longer dismiss an employee solely upon complaint of the union that he has violated union rules.

Extra men called for work will continue to receive a guarantee of six hours' wages. The Saturday half-holiday with pay for shop employees is abolished. Time and a half for Sunday and holiday work and overtime to mechanical and miscellaneous employees will be discontinued. Free transportation to employees, whether or not they are in uniform, will be continued.

Seniority rating of regular conductors and motormen will remain unchanged, but work for men on the spare list will be assigned instead of being selected by seniority. Seniority rating of mechanical and miscellaneous employees will be eliminated.

Local discipline cases will be taken up by the manager and labor representatives as in the past and appeal can be made to the public trustees, who will meet one day each month for the purpose of hearing such cases as may be referred to them.

The trustees claim that changes in working conditions and wages provided for in the new agreement are proposed solely to increase efficiency and to help reduce fares.

Arbitration Unavailing in Davenport

State arbitration, tried in Iowa for the first time, has failed to settle the dispute between the trainmen's union and the Tri-City Railway over the discharge of the president of the union for criticising company descipline in a public address.

Following a hearing at Davenport the board, appointed by Governor N. E. Kendall, found "the defendant company was in error, in denying the arbitration of this controversy, under the terms of its contract."

The board, however, did not recommend the reinstatement of the discharged union official, stating this was not within its province. This leaves the controversy just where it was before resort was made to State arbitration.

While the trainmen's union voted to back up its discharged official with a strike, none has been called and the men appear to have let the matter drop.

In the meantime the trainmen are drawing a 70-cent maximum wage held in force by an injunction secured by the Socialist City Attorney of Davenport. There has so far been no disposition on the part of the company to go into court and fight this injunction, probably because the wage scale expires with the old contract on June 1. The Socialist party took sides with the trainmen, when the company notified the latter their wages would be cut from 70 to 40 cents an hour on April 1 and secured an injunction to prevent this cut. Since then an injunction has been employed to prevent the shortening of the bridge line loop, a measure of economy resorted to by the railway.

Future Policy of Detroit United Not Announced

No announcement has been made by the Detroit (Mich.) United Railway as to what action it will take next with respect to the future, in view of the recent defeat of its service-at-cost plan. An early meeting of the directors of the company is scheduled and some action will probably be announced soon after this meeting. Announcement was made by the company prior to the election, however, that no matter what was the outcome of the referendum it would continue to give such service as it was enabled to.

The final count of the ballots cast on April 4 on the two ordinances pertaining to railway matters in Detroit, showed results about as indicated by the preliminary reports based upon counts from a few precincts. The Detroit United Railway's proposed service-at-cost ordinance was voted down, while the city's purchase-plan ordinance was carried with about the same percentage of votes as were cast last year in favor of the bond issue to provide for a municipal system of street railways for the city.

The company's proposition required a 60 per cent affirmative vote, but received only about 36½ per cent. The city's ordinance providing for the purchase of several sections of Detroit United Railway lines received about 65 per cent majority.

Reports from the sections of the city now being served by the new Detroit Municipal Railway lines, which have been in operation since Feb. 1, indicate that municipal ownership was highly indorsed. In some instances in the St. Jean and Charlevoix district, a vote of approximately four to one was reported in favor of the purchase plan ordinance.

Wage Conference Proposed in Salt Lake City

New contracts between the Utah Light & Traction Company, Salt Lake City, Utah, and the Amalgamated Association are being sought by company officials. The present contract, which has to do with hours of work, wages and working conditions, will expire on May 1.

A proposal to reduce the present pay of platform men and carhouse mechanics is anticipated by the union officials, but nothing of this nature was mentioned at the preliminary conference between General Manager Dicke of the company and President Baker of the union. It was said recently, however, that if a wage reduction were sought it might, in some instances, be as much as 20 per cent. Company officials would not discuss the matter other than to say that a request for a conference had been made by it.

The time for holding the conference was designated as April 11.

City Seeks Crossing Rights

Legislation effecting the crossing of privately owned lines by municipally owned railways in Detroit has been introduced in the State Legislature. One bill, the Pitkin bill, is reported as an amendment of the general railroad law which makes no provision for crossings by municipally owned lines. The Pitkin bill provides for the handling of such crossings by the State Public Utilities Commission.

The Copley bill, introduced about a week prior to the Pitkin bill, would give the City Council power to decide questions relative to such crossings.

In discussing the Pitkin bill, David H. Crowley, special counsel for the city of Detroit in street railway matters, who drafted the Copley bill, stated that the former would endanger the success of municipal ownership in Detroit. It would transfer jurisdiction over municipal street railway crossings to an outside body such as the Public Utilities Commission, while such crossings primarily concern the city.

The Copley bill, Mr. Crowley states, gives the commission a limited authority to pass on safety devices for crossings in which a street railway is involved, while the Pitkin bill, if it delegates control of such crossings entirely to the commission, is dangerous to municipal ownership.

Carhouse Changes at Boston

On account of the destruction of two large surface carhouses by recent disastrous fires the Boston (Mass.) Elevated Railway has undertaken extensive repairs and enlargements of two other carhouses to provide the necessary facilities. On Feb. 21 the carhouse at Neponset was burned to the ground, followed by the partial destruction of the Amory Street carhouse on March 4.

To provide for the loss of the Neponset station the so-called Park Street carhouse at Fields corner is being entirely remodeled. The old wooden structures are being demolished and a new brick building is to be constructed in the center of the area with a lobby and office building at one side. The track layout is being revised to accommodate a total of 122 of the largest type cars.

The plan is to establish an up-to-date carhouse of good exterior appearance for the storage inspection and minor repairs of surface cars. The area on the public street sides is to be surrounded by a neat masonry wall, and it is expected that property in the neighborhood will be considerably improved by the removal of the unsightly wooden structures and the construction of the new carhouse and office building. The layout has been worked out on lines similar to those in use in Cleveland and other Middle West cities and will be thoroughly fireproof and modern in every respect.

To take the place of the Amory Street house the old surface car station at Forest Hills, which for some time has been out of use except as a dead storage plant, will be repaired and put into shape for about 100 of the largest cars. It will be put into service as a full operating rating station, with inspection and repair facilities, pits, etc.

Practically all this repair and reconstruction work will be done by the engineers and working forces of the company.

Although a considerable number of old cars were destroyed by the two fires the trustees are not planning any immediate additions to rolling stock except ten one-man cars, on which bids have been asked.

Trainmen Agree to Wage Cut

Motormen and conductors of the North Alabama Traction Company at Albany and Decatur voluntarily agreed to accept a cut of about 5 per cent. in their wage scale in a hearing before the Public Service Commission on April 4 of the petition of the receiver of the company for permission to operate one-man cars on all lines. The proposal was made by Melvin Hutson, attorney for the men, who opposed the receiver's petition. Witnesses for the company testified that the monthly deficit of the company now is about $800. The proposed cut of the employees would save about $250 a month.. If the company is permitted to operate one-man cars the services of eight employees will be dispensed with, which will save the company a little more than $900 a month, and will give an earning of about $100 a month, provided other expenses do not increase.

Cleveland Men Voting

Officials of the union representing the 3,400 motormen and conductors in the employ of the Cleveland (Ohio) Railway Company have offered to accept the 20 per cent reduction in pay effective on May 1 if the company's closed shop agreement with the men is allowed to remain in force. John J. Stanley, president of the railway, has consented to this providing the closed shop agreement is changed sufficiently to permit union members to resign from the union without being forced to quit the company's service. All new men must join the union within sixty days after entering the employ of the company.

The 20 per cent wage reduction will make the wages of the Cleveland men 55 cents an hour for the first three months, 58 cents an hour for the next nine months, and 60 cents an hour thereafter instead of 70-72 and 75 cents an hour.

At mass meetings of the union members on April 13 propositions made by Mr. Stanley were discussed. It was planned to conduct a referendum vote on the propositions among the members on April 15. The proposals upon which the men were to vote are:

1. To accept a 20 per cent wage reduction and the closed shop agreement to remain in effect as at present.

2. To accept a reduction in pay to make the scale 55c. an hour for the first year and 62c. and hour thereafter, the closed shop agreement remaining in effect except for an amendment that will permit members of the Union to resign without being forced to quit the company's service.

3. To arbitrate all points in dispute including the closed shop, questions to be as follows:

Shall the company continue the present closed shop in effect?

Shall compensation for the trainmen be continued as provided by the War Labor Board for night runs, spread runs and Sunday runs?

What shall the new rate of pay be?

In case the men elect to have all points in dispute arbitrated, James H. Vahey, Boston, attorney for the International Union, is to represent the men, while C. Loomis Allen, Syracuse, is to act for the company.

Mr. Stanley and officials of the union have come to a practical agreement regarding other demands of Mr. Stanley for changes in the present clauses inserted by the War Labor Board. This understanding between the union officials and Mr. Stanley calls for the elimination of all extra pay for the spread time runs, continuation of ten hours pay for eight hours night car runs and payment of time and a quarter for work in excess of regular runs instead of time and one-half.

Irregularities Alleged in Connection with Railway Legislation in Massachusetts

A formal investigation has been started by the Massachusetts Legislature of charges of irregularities in connection with the passage of legislation in 1918 and 1919 affecting the Boston (Mass.) Elevated Railway and the Eastern Massachusetts Street Railway. Although there has been constant criticisms of members of the Legislature ever since the passage of the acts establishing the public trustee method of control of these two traction properties, it was not until recently that open charges were made.

During the course of a debate on a bill to have the trustees report on the feasibility of instituting more 5-cent fare lines in Boston, Representatives Hays and Lomasney both openly charged that members of the 1918 Legislature borrowed money from certain Boston trust companies and speculated in railway stock just prior to the passage of the legislation, the inference being that they were thus influenced to vote for the bill which would presumably increase the market value of the railway securities. These charges aroused a great deal of discussion in the press and in the present Legislature with the result that an order was passed for an investigation.

A committee has been appointed consisting of Senators Lyman A. Griswold, chairman, and Walter A. Hardy, Representatives Henry L. Shattuck, James B. Brown and John W. McCormack, none of whom was a member of the 1918 Legislature. It was decided at the start to have no one on the investigating committee who was a member of the Legislature at the time the bills were passed. Subsequently it was decided to investigate the 1919 Legislature, which passed the bill authorizing the Commonwealth to purchase the Cambridge subway from the Boston Elevated Railway.

The State Bank Commissioner has been directed to furnish to the committee the names of all Senators or Representatives in 1918 who had loans in any of the trust companies in Massachusetts which have been closed as a result of financial difficulties. It is also proposed to broaden the scope of the inquiry to require the Boston Elevated Railway to furnish its transfer books and records, and to call upon Boston brokerage firms for a record of their transactions at the time of this particular legislation.

Eight-Hour Bill Defeated.—Senate bill No. 313, in the California Legislature, known as Harris eight-hour bill for electric railway man, was passed out favorably by the labor and capital committee of that body, but was defeated in the Senate on March 31. The first vote was twenty-two to sixteen. The measure was then set over for reconsideration and was defeated on April 9 by vote of twenty-one to eighteen.

News Notes

Attempt to Repeal Utilities Law Fails.—Attempts to abolish the Utility Commission of Tennessee have failed in the present Legislature which has only less than one week to run now before final adjournment.

Electrical Industry Advertised. — A page advertisement appears in *Collier's* for April 9 entitled "Will Your Town Stop or Move Ahead?" It is inserted by the *Electrical World* and points out that during the next four years the electric light and power industry, if it is to keep up with the demands, needs an additional investment of approximately $4,000,000,000. The interest which the public has in the adequate development of the electric light and power companies is pointed out. The advertisement is signed by James H. McGraw, president of the McGraw-Hill Company, Inc.

Municipality to Install Trackless Trolley.—The Board of Estimate of New York City has appropriated $383,200 for extensions, improvements, and operation of municipal trolleys. Of this sum, $83,200 was given to the Staten Island lines to extend service on the Meyers Corners line to Linoleumville and to put into operation a trackless trolley between Schmidt's lane and Seaview Hospital. Of the amount set aside $150,000 will go to purchase sixty used cars to take care of the summer traffic in Staten Island. A similar amount was appropriated for the purchase of one-man cars for the Williamsburg Bridge.

Interurban Reduces Wages.—A reduction in the wages of its trainmen of 17½ per cent and those of linemen trackmen, shopmen and power house men of from 15 to 20 per cent was made on April 1 by the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind. This, it is explained, makes a reduction that amounts to approximately one-half of the increases granted since 1918. The wages of the trainmen were reduced from 47 cents to 40 cents an hour, while the wages of the linemen, shopmen, trackmen and power house men, which varied from 35 to 60 cents an hour, were reduced to from 30 cents to 50 cents an hour.

Wage Reduction Talk in Cincinnati.—The Cincinnati (Ohio) Traction Company has notified its stationary firemen it desires to reduce their wages. This is in accordance with the existing contract between the company and the Union. The firemen's contract year ends May 1, that of the engineer's June 1 and of the motormen, conductors and other employees July 1. All would run on from year to year unless modified. It has not been announced how much the company wants the wages of the firemen reduced, but there is a report that it is around 20 per cent. Stationary firemen get 90 cents an hour and regular motormen and conducotrs 59 cents an hour.

Trainmen Accept Wage Cut.—Employees of the Albany Southern Railroad, Hudson, N. Y., have agreed to accept a 10 per cent reduction in wages. General Manager Hewes in a circular letter to the employees issued on April 2 asked them, in view of the reduced earnings of the company, to accept a cut of 10 per cent in their pay. The employees asked for a conference with the general manager. The request was granted and after a discussion of the subject of the company's condition the employees agreed to accept the reduction. The reduction affects motormen, conductors, freight crews, freight handlers and some others. The motormen and conductors were receiving 55 cents an hour.

Programs of Meetings

National Electric Light Association

The National Electric Light Association will hold its forty-fourth annual convention in Chicago from May 31 to June 3, 1921. The business session and meetings of the convention will be held at Hotel Drake.

Mechanical Division of A. R. A.

The general committee of the Mechanical Division of the American Railway Association, at a meeting in New York on March 30, decided to hold a business session at the Hotel Drake, Chicago, on June 15 and 16, instead of the convention that was to have occurred at Atlantic City. The program has been modified and reports will be presented only by the committees on the following subjects: Prices for Labor and Material, Car Construction, Loading Rules, Brake Shoe and Brake Beam Equipment, Train Brake and Signal Equipment, Specifications and Tests for Materials, Tank Cars and Standing Methods of Packing Journal Boxes. Both morning and afternoon sessions will be held.

Chamber of Commerce

The ninth annual meeting of the Chamber of Commerce of the United States will be held at Atlantic City, N. J., April 26 to 29, 1921. The session will begin with a meeting of the national councillors on the afternoon of April 26. Thereafter there will be general sessions in the morning of each day and the afternoon of April 29, with group meetings on the afternoons of April 27 and 28. The groups this year are (1) civic development, (2) domestic distribution, (3) fabricated production, (4) finance, (5) foreign commerce, (6) insurance, (7) national resources production and (8) transportation and communication, including (a) shipping and (b) railroads. The two sections of the transportation group meet separately on Wednesday afternoon but jointly on Thursday afternoon.

Financial and Corporate

Toledo Deficit Increasing

Economies Sought From Wage Readjustment, Revised Power Rates and Car Rerouting

The operating deficit of the Community Traction Company, Toledo, Ohio, for March is expected to be larger than that for February, when it amounted to $58,000. The payments made on April 11 showed a balance of about $37,000 accumulated in the maintenance, depreciation and claims and damage funds to offset the deficit in the stabilizing fund, which has fallen below the $300,000 mark now. Maintenance has been set at 10 cents a car-mile in order to create a surplus for summer work. In the depreciation fund, which may be used for extensions and betterments, there is now a surplus of $14,000.

The wage conference held for the purpose of working out a contract between the Community Traction Company and the carmen's union has dragged along and will probably end in a deadlock. The men have been offered a cut in wages from 60 cents to 58 cents an hour. A vacation of two weeks with pay has also been withdrawn. Electrical workers are also debating the terms of a new agreement and in the meantime the old contract is being extended.

It is thought that action on contracts is being postponed in order to await the decisions of conferences due on May 1 between the men and the railways at Detroit and Cleveland. The Toledo contract has always been one month in advance of the contracts of these two cities, and on a down-scale revision of wages is put in an important position in the bargaining. What step the city might take to protect its equity in the property in event of a strike is problematical. The commissioner and board of control may have something to say about wages to be paid before the matter is definitely settled.

The refusal of Henry L. Doherty to allow city experts to view the books of the Acme Power Company, one of his subsidiary power companies in Toledo, in an effort to fix a reasonable rate for power supplied by the Toledo Railways & Light Company to the Community Traction Company has brought forth a friendly effort from the city officials to bargain with the company. The conferences on power will be taken up soon by Henry Riggs, Ann Arbor; V. B. Phillips, Cleveland, and David Friday, Ann Arbor, who have been secured to determine the rate for the contract. The Acme Power Company has set a rate at 2.35 cents a kilowatt, which the commissioner has disapproved as excessive.

A portion of a rerouting plan suggested to the Council by Commissioner Wilfred E. Cann has passed the Council committee and will without doubt be put into effect in a few weeks. It is a plan to eliminate a portion of one by combining two lines into a one-way belt. The elimination of the Indiana Avenue line as proposed has not had the sanction of the Council as yet. The changing of the Huron and Erie lines and the making of a separate line of Western Avenue will effect a saving estimated at $97,000 a year in the operation of the system here.

Suspension of Service Suggested

Threats to abandon the City Railway line and perhaps the Wheeling & Elm Grove Line, both owned by the Wheeling (W. Va.) Public Service Corporation, were made at a meeting of the City Council by J. D. Whittemore, general manager, following orders from the city to pave between the tracks. Mr. Whittemore said:

> Notwithstanding the revision of the fares effective during December, 1920, the City Railway continues to operate at a deficit, and inasmuch as there appears to be little prospect of relief in sight the directors of the company have voted to call a meeting of its stockholders and to recommend that they take such steps as may be necessary to discontinue the operation of the road and liquidate whatever assets may remain. It is expected that the stockholders of the company will follow this recommendation and that immediate steps will be taken to wind up the affairs of the corporation.
>
> In view of these facts and conditions, I regret to state that it will not be possible for the City Railway to undertake any of the work outlined in your letters.

Buses compete with lines of the Wheeling & Elm Grove Company.

Direct Offering Successful

$1,000,000 of Notes Sold in Twelve Days to Employees, Customers and Public

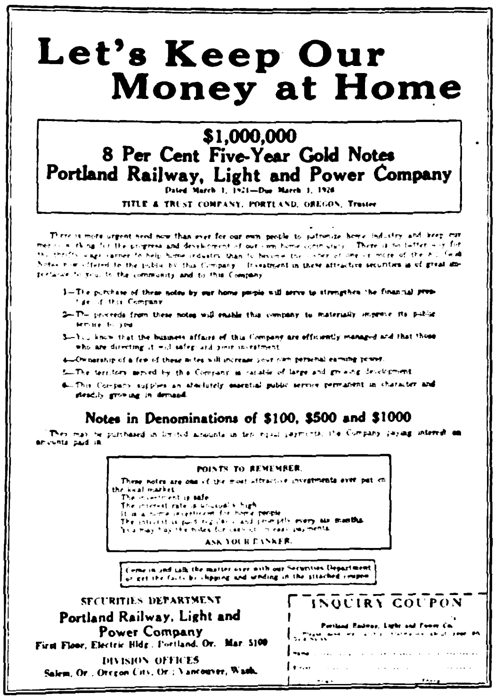
The Portland Railway, Light & Power Company, Portland, Ore., has sold to its employees, customers and to the public an issue of $1,000,000 of 8 per cent five-year gold notes, the entire offering being disposed of in twelve days, with a considerable oversubscription. This is the first attempt the company has made to dispose of securities since the original preferred and common stock of the company was sold.

The campaign was conducted by the company itself through its employees, but met with whole-hearted co-operation from the many banking institutions located in the Portland territory. These banks disposed of nearly $100,000 of the gold notes purely as an accommodation without a cent of commission for this service.

The selling organization of the company was under the direction of A. C. McMicken, commercial manager of the company. The sales force consisted of about fifteen officials and department heads who acted as "key men." These chairmen recruited their individual committees for selling the notes to the other employees and to the company's patrons. The publicity and advertising in connection with the offering were directed by W. P. Strandborg of the company.

The success of the campaign is indicated by the fact that nearly 1,900 out of 2,800 employees of the company subscribed for the notes. The balance of the offering was taken by the public, the total number of individual subscribers being approximately 33,000.

A remarkable feature of the campaign was the fact that approximately



Let's Keep Our Money at Home

$1,000,000
8 Per Cent Five-Year Gold Notes
Portland Railway, Light and Power Company
Dated March 1, 1921—Due March 1, 1926
TITLE & TRUST COMPANY, PORTLAND, OREGON, Trustee

There is more urgent need now than ever for our own people to patronize home industry and keep our money working for the progress and development of our own home community. There is no better way for the thrifty wage earner to help home industry than to become the owner of one or more of the 8% Gold Notes now offered to the public by this Company. Investment in these attractive securities is of great importance to you, to the community and to this Company.

1—The purchase of these notes by our home people will serve to strengthen the financial prestige of this Company.

2—The proceeds from these notes will enable this company to materially improve its public service to you.

3—You know that the business affairs of this Company are efficiently managed and that those who are directing it will safeguard your investment.

4—Ownership of a few of these notes will increase your own personal earning power.

5—The territory served by this Company is capable of large and growing development.

6—This Company supplies an absolutely essential public service permanent in character and steadily growing in demand.

Notes in Denominations of $100, $500 and $1000

They may be purchased in limited amounts in ten equal payments, the Company paying interest on amounts paid in.

POINTS TO REMEMBER.

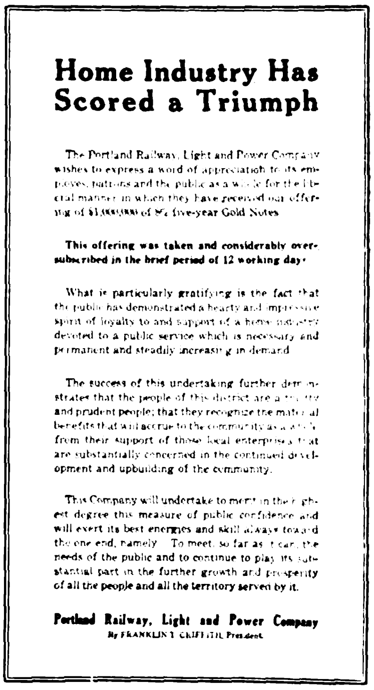
These notes are one of the most attractive investments ever put on the local market.
The investment is safe.
The interest rate is unusually high.
It is a home investment for home people.
The interest is paid regularly and promptly every six months.
You may buy the notes for cash or in easy payments.

ASK YOUR BANKER.

Come in and talk the matter over with our Securities Department or get the facts by clipping and sending in the attached coupon.

SECURITIES DEPARTMENT
Portland Railway, Light and Power Company
First Floor, Electric Bldg., Portland, Or. Mar. 5100
DIVISION OFFICES
Salem, Or., Oregon City, Or.; Vancouver, Wash.

INQUIRY COUPON
Portland Railway, Light and Power Co.



Home Industry Has Scored a Triumph

The Portland Railway, Light and Power Company wishes to express a word of appreciation to its employes, patrons and the public as a whole for the liberal manner in which they have received our offering of $1,000,000 of 8% five-year Gold Notes.

This offering was taken and considerably over-subscribed in the brief period of 12 working days.

What is particularly gratifying is the fact that the public has demonstrated a hearty and impressive spirit of loyalty to and support of a home industry devoted to a public service which is necessary and permanent and steadily increasing in demand.

The success of this undertaking further demonstrates that the people of this district are a thrifty and prudent people; that they recognize the material benefits that will accrue to the community as a whole from their support of those local enterprises that are substantially concerned in the continued development and upbuilding of the community.

This Company will undertake to merit in the highest degree this measure of public confidence and will exert its best energies and skill always toward the one end, namely: To meet, so far as it can, the needs of the public and to continue to play its substantial part in the further growth and prosperity of all the people and all the territory served by it.

Portland Railway, Light and Power Company
By FRANKLIN T. GRIFFITH, President

SPECIMENS OF THE APPEAL AND THE APPRECIATION

70 per cent of the subscriptions were paid for in actual cash, although the company offered two forms of partial payment subscriptions—one 10 per cent down and 10 per cent a month, and the other 10 per cent down and the balance before April 15. As indicating the wide-spread distribution of the company's notes the largest individual sale was $7,500.

In conjunction with the selling campaign an intensive advertising drive was conducted in which both the educational and selling features of the undertaking were emphasized. The company sent to its 54,000 customers a four-page circular containing a great deal of detailed information about the company's affairs and also about the notes themselves. With this circular went a letter signed by Franklin T. Griffith, president of the company, and an information card with details of the method of applying for the notes.

An "Inquiry Coupon" was attached to the circular and as the requests for further information came in they were tabulated and indexed and followed up by sending out an illustrated folder of eight pages with additional information about the note issue and the service which the company is rendering to the many communities in its territory. In addition to this a series of fifteen display advertisements, quarter page in size, were used in the local daily papers and selected advertisements were used in practically all the publications in the territory that is served by the company.

These display advertisements were supported by two special issues of *Watts Watt*, the official publication of the company distributed on the cars every Friday morning. Attractive car cards were also used as dash signs on all the company's passenger cars for a period of two weeks and window newspapers pointing out attractive investment features of the gold notes were displayed, two in each car.

An important feature of the campaign was the method used in securing the names of prospects. Each of the 2,800 employees of the company was pledged to turn in to the campaign organization a list of three names each day for a period of ten days. This gave the selling force a list of 84,000 persons and these were carefully sifted by removing duplications and eliminating those that were not regarded as favorable prospects, and the balance of the list was turned over to teams of two employees each and personal solicitation was made.

The entire cost of the campaign was substantially less than if the notes had been offered to the public through the regular banking and investment channels. The exact cost of the campaign is not available at this time, but as evidence of the very nominal cost it can be said that the expense for advertising, which was the major part of the cost, was under 0.7 of 1 per cent. The balance of the cost was limited virtually to printing of the forms, blanks and stationery and the necessary postage.

Quebec Company Negotiating Sale.—The Quebec Railway, Light, Heat & Power Company, Quebec, Que., is negotiating for the sale of the Quebec & Montgomery Railway. With the sale of this railway the company will become solely a public utility concern.

Railway Credit Growing Steadily

Notwithstanding Increased Operating Ratio City and Interurban Company's Credit Indicator Increases 10 per Cent

According to an analysis of operations covering 127 electric raliway companies made by E. J. Murphy, statistician of the bureau of information and service of the American Electric Railway Association, the gross income for seventy-two urban companies increased 4.3 per cent, while for fifty-five interurban companies it increased 4.9 per cent over the previous year. Deductions by interurban companies increased 7.9 per cent against 0.15 by urban companies.

EVEN with these increased fixed charges the net income of city companies applicable to dividends increased 42.5 per cent, interurban companies decreased 1.6 per cent, while if combined the weighted average shows a 24.5 per cent gain.

The credit index, that is, the ratio of gross earnings to gross income, also shows improvement. In the case of the urban companies it increased from 4.74 to 5.24, the interurban companies 3.65 to 3.98 while if the totals are combined the index is 4.54 and 5.02 for 1919 and 1920 respectively, a gain of slightly more than 10 per cent.

Deductions from gross income, for fixed charges, are still greater than it should be for a sound financial basis. Improvement has been made by the urban companies. In 1920 this percentage was 87.8, as against 90.3 the previous year. For the interurban companies the opposite is true. In 1920, 70.8 per cent of gross income went to fixed charges while in 1919 the percentage was 68.8.

On a combined basis the operating revenue increased 16.3 per cent and operating expenses 18.9 per cent. The operating ratio increased from 76.8 in 1919 to 78.4 in 1920: The increase in operating expenses seems to have been consistent. For all companies it was 18.9 per cent, for the city companies 18.8 per cent and for interurbans 19.2.

An analysis of the operating accounts shows that notwithstanding this increase the amount spent for each item follows practically the same percentage for the two years, the greatest variation, however, being in the cost of power, with the cost of conducting transportation next. Both of these variations were in the neighborhood of 1 per cent.

TABLE I—COMBINED INCOME STATEMENT OF SEVENTY-TWO CITY AND FIFTY-FIVE INTERURBAN ELECTRIC RAILWAYS FOR THE CALENDAR YEARS 1919 AND 1920

	72 City Companies			55 Interurban Companies			127 City and Interurban Companies		
	1920	1919	Per Cent Increase	1920	1919	Per Cent Increase	1920	1919	Per Cent Increase
Railway operating revenue	$229,629,280	$196,999,477	16.6	$37,724,460	$32,75,494	15.2	$267,353,740	$229,751,971	16.3
Operating expenses:									
Way and structures	$22,625,964	$19,166,412	18.0	$4,818,027	$4,113.560	17.1	$27,443,991	$23,279,972	17.9
Equipment	23,742,679	20,480,766	15.9	3,431,323	3,041,514	12.8	27,174,002	23,522,280	15.5
Power	28,940,898	22,978,675	25.9	5,753,790	4,566,871	25.8	34,694,688	27,545,546	25.9
Conducting transportation	81,972,242	68,629,920	13.8	9,200,254	7,872,619	16.7	91,172,496	76,502,539	18.1
Traffic	688,120	664,679	3.5	250,454	228,596	9.6	938,574	893,275	5.1
General and miscellaneous	23,475,899	20,796,833	12.8	4,912,135	3,969,733	23.7	28,388,034	24,766,566	14
Transportation for Investment. Cr.	113,036	131,085	*13.8*	2,927	1,078	171.5	115,963	132,163	*12.2*
Railway operating expenses	$181,332,766	$152,586,200	18.8	(b) $28,365,448	(a) $23,799,021	19.2	$209,698,214	$176,385,221	18.9
Net operating revenue	48,296,514	44,413,277	8.7	9,359,012	8,953,473	4.5	57,655,526	53,366,750	8.0
Operating ratio	79.2	77.5	2.2	75.2	72.6	3.6	78.4	76.8	2.1
Net revenue: Auxiliary operations.	$9,821,719	$10,145,846	*3.2*	$1,513,818	$1,634,812	*7.4*	$11,335,537	$11,780,658	*3.8*
Taxes	15,672,984	13,448,647	16.5	1,965,564	1,731,456	13.5	17,638,548	15,180,103	16.2
Operating income	42,445,249	41,110,476	3.3	8,907,266	8,856,829	0.57	51,352,515	49,967,305	2.8
Non-operating income	3,969,075	3,389,232	17.1	1,241,669	816,228	52.2	5,210,744	4,205,460	23.9
Gross income	46,414,324	44,499,708	4.3	10,148,935	9,673,057	4.9	56,563,259	54,172,765	4.4
Deductions	40,198,081	40,136,210	0.15	7,187,695	6,663,743	7.9	47,385,776	46,799,953	1.3
Net income	6,216,243	4,363,498	42.5	2,961,240	3,009,314	*1.6*	9,177,483	7,372,812	24.5
Per Cent: Gross income to fixed charges	115.5	110.9	4.1	141.2	145.2	*2.8*	119.4	115.8	3.1
Ratio: Net income to operating revenue	2.7	2.2	2.3	7.9	9.2	*14.6*	3.4	3.2	5.7
Car-miles operated	530,238,431	518,507,394	2.2	74,609,893	73,306,782	1.8	604,848,324	591,814,176	2.2

Figures in italics denote decrease. (*a*) Includes $7,206 undistributed expenses. (*b*) Includes $2,392 undistributed expenses.

TABLE III—OPERATING STATISTICS AND DERIVED RATIOS FOR THE CALENDAR YEARS 1919 AND 1920

	City				Interurban				Total City and Interurban			
	No. of Companies	1920	1919	Per Cent Increase	No. of Companies	1920	1919	Per Cent Increase	No. of Companies	1920	1919	Per Cent Increase
Operating revenue	72	$229,629,280	$196,999,475	16.6	55	$37,724,460	$32,752,494	15.2	127	$267,353,740	$229,751,971	16.4
Per mile of line	53	44,336	38,662	14.7	44	11,656	10,354	12.5	97	32,067	27,927	14.8
Passenger revenue	72	$219,950,509	$191,975,086	14.5	55	$31,729,735	$27,649,905	14.8	127	$251,680,244	$219,624,991	14.5
Per revenue passenger	68	0.069	0.063	7.9	43	0.12	0.11	9.1	111	0.072	0.066	9.1
Per car-mile	72	41.5	37.0	12.1	55	42.4	37.7	17.4	127	41.6	37.1	12.1
Per mile of revenue track	60	$25,508	$22,755	12.1	45	$8,010	$7,177	11.2	105	$20,325	$18,243	11.4
Per car-hour	68	3.72	3.81	*2.3*	46	4.64	4.09	13.4	114	3.82	3.42	11.6
Per maximum revenue car operated daily	59	$15,598	$13,729	13.6	39	$17,049	$15,410	10.5	98	$15,739	$13,894	13.2
Total passengers	71	3,903,547,828	3,755,907,509	3.9	48	274,064,071	255,575,776	7.2	119	4,177,611,899	4,011,483,285	4.1
Revenue passengers	68	2,933,559,233	2,807,339,035	4.5	42	241,660,531	226,021,569	6.9	110	3,175,219,764	3,033,360,604	4.6
Per car-mile	68	6.2	6.1	1.8	42	3.7	3.6	2.7	110	5.9	5.8	1.7
Per car-hour	66	57.4	56.4	1.7	39	46.8	45.2	3.5	105	56.4	55.3	1.9
Per mile of revenue track	58	375,540	356,788	5.3	37	74,642	69,638	5.7	95	300,169	284,316	5.6
Per maximum revenue cars operated daily	57	211,121	242,451	*12.9*	31	124,276	115,971	7.2	88	204,826	228,903	*10.5*
Transfer passengers	61	735,758,394	707,087,306	4.1	21	23,492,729	21,974,451	6.9	82	759,251,123	729,061,757	4.1
Ratio: Transfer passengers to revenue passengers	61	25.3	27.6	*8.3*	18	11.6	11.7	*.8*	79	24.4	26.3	*7.2*
Car-miles operated	72	530,238,431	518,507,394	2.3	55	74,609,893	73,306,782	1.8	127	604,848,324	591,814,176	2.2
Per car-hour	68	9.1	9.1	..	46	11.0	10.9	.9	114	9.3	9.3	....
Per mile of revenue track	60	59,723	59,147	1.0	45	18,974	18,843	.6	104	43,750	36,028	21.4
Per maximum revenue car operated	59	39,547	40,042	*1.2*	39	40,673	40,943	*.6*	98	39,656	40,130	*1.1*
Car-hours	68	45,516,538	44,425,174	2.5	46	5,495,175	5,370,832	2.3	114	51,011,713	49,796,006	2.4
Miles of line	53	4,233.4	4,137.6	2.3	44	2,545.0	2,527.8	.7	97	6,778.4	6,665.4	1.7
Miles of revenue single track	60	7,665.4	7,546.2	1.6	45	3,094.9	3,074.8	.7	105	10,760.3	10,621.0	1.3
Average maximum number of cars operated daily	59	10,591	10,258	3.2	39	1,141	1,112	2.6	98	11,732	11,370	3.1

Italics indicate decrease

The amount of service rendered by the city companies increased 2.2 per cent, while for the interurban companies it increased but 1.8 per cent. The traffic index, car-miles per revenue passenger for sixty-eight city companies, shows a slight decrease. In 1920 the ratio was 0.1615, as compared with 0.164 in 1919. For forty-two interurban companies the index was 0.2705 in 1920, as against 0.278 in 1919.

Inquiry Into Ending of Trusteeship.—Termination of the trusteeship of the Connecticut Company, New Haven, Conn., was discussed at an executive session of the committee of railroads of the General Assembly at Hartford on April 5, with the result that two of its members were delegated to ask the Attorney General for advice as to the course to be taken in turning the company over to the stockholders.

Public Service Railway Valuation Announced

$125,000,000 Fixed for Rate Making Purposes as Value of Property and Business Employed for Public Convenience

The value of the property and business of the Public Service Railway, Newark, N. J., as of Jan. 1, 1921, employed for the public convenience is $125,000,000 with an operating efficiency of the physical property and organization of 86 per cent. This is the judgment of Ford, Bacon & Davis, engineers, New York, who were employed by the street railway valuation commission of New Jersey, Aug. 30, 1920. "Value of Service" is the test applied.

THE engineers were instructed to ascertain and determine the value of all the property, including every proper and lawful element thereof, of the Public Service Railway, in accordance with Chapter 351, Laws of 1920, State of New Jersey. The members of the valuation commission are Edward E. Edwards, governor, William T. Read, State Treasurer, and Newton A. K. Bugbee, Comptroller.

On April 11, 1921, Ford, Bacon & Davis transmitted their complete and detailed report covering the valuation for use in fixing rates under existing laws, an abstract of which follows: In arriving at the final figure representing the value of the railway property they have been guided by the decision of the Supreme Court of the United States in Smyth vs. Ames "what the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience"; in other words, the valuation submitted includes only so much of the business and property of the Public Service Railway as it employs for the public convenience and excludes any so-called element of franchise value. The valuation also excludes the property of the Public Service Railroad.

The unamortised cost of the superseded property, which has been discarded due to obsolescense or inadequacy was found to be $4,701,943 and the reproduction cost of the property not used in operation based on Sept. 1, 1920 prices for labor and material was $645,593. Both of these figures are given in order to comply with the law, which calls for a determination of the value of all of the property.

The cost of the property as a going concern built up from actual expenditures of the company as revealed by its records, in other words the historical cost, was $119,150,163.

TABLE II—COMPARATIVE SUMMARIZED INCOME STATEMENT (ON A CAR MILE BASIS) OF 127 ELECTRIC RAILWAYS FOR THE CALENDAR YEARS 1919 AND 1920

	Seventy-Two City Companies			Fifty-Five Interurban Companies			127 City and Interurban Companies		
	1920 Cents per Each Mile	1919	Per Cent Increase	1920 Cents per Each Mile	1919	Per Cent Increase	1920 Cents per Each Mile	1919	Per Cent Increase
Railway operating revenue	43.3	38.0	13.9	50.6	44.7	13.2	44.2	38.8	13.9
Operating expenses:									
Way and structures	4.3	3.7	16.2	6.5	5.6	16.1	4.5	3.9	15.4
Equipment	4.5	3.9	15.4	4.6	4.1	12.2	4.5	4.0	12.5
Power	5.5	4.4	25.0	7.7	6.2	24.1	5.7	4.7	21.3
Conducting transportation	15.5	13.2	17.4	12.3	10.7	15.0	15.1	12.9	17.6
Traffic	0.1	0.1	....	0.3	0.3	....	0.2	0.2	....
General and Miscellaneous	4.4	4.0	10.0	6.6	5.4	22.2	4.7	4.2	11.9
Transportation for Investment Cr.	0.02	0.03	*33.3*	0.04	.001	300.0	0.02	0.02	....
Total operating expenses	34.3	29.3	17.1	38.0	32.3	17.6	34.7	29.8	16.4
Net operating revenue	9.1	8.6	5.8	12.6	12.2	3.3	9.5	9.0	5.6
Operating ratio: (per cent)	79.2	77.5	2.2	75.2	72.6	3.6	78.4	76.8	2.1
Net revenue: auxiliary operations	1.9	1.9	*5.0*	2.0	2.2	9.1	1.9	2.0	5.0
Taxes	3.0	2.6	15.4	2.6	2.2	9.1	1.9	2.0	5.0
Operating income	8.0	7.9	1.3	12.0	12.0	....	8.5	8.4	1.2
Non-operating income	0.7	0.7	....	1.6	1.1	45.5	0.9	0.7	28.6
Gross income	8.7	8.6	1.2	13.6	13.01	3.8	9.4	9.1	3.3
Deductions from gross income	7.6	7.7	*1.3*	9.6	9.1	5.5	7.8	7.9	1.3
Net income	1.1	0.9	22.2	4.0	4.0	....	1.6	1.2	33.3
Per cent: Gross income to fixed charges	115.5	110.9	4.1	141.2	145.2	2.8	119.4	115.8	3.1
Ratio: Net income to operating revenue	2.7	2.2	2.3	7.9	9.2	14.6	3.6	3.1	16.1

The report says that it seems to have been the practice in the past to attempt to determine the value of a public utility without regard to the value of the service rendered to the public, placing "as it were, the cart before the horse, and resulting in there being no real foundation for the values thus attempted to be established." If the value of the service rendered is once established, the value of the property devoted to the public use is readily determined by ordinary economic considerations. The value of service consists of the normal cost of rendering such service plus the profit necessary to induce capital to flow into the business.

The cost of service as defined includes operating expenses, plus depreciation, allowance for obsolescence where changes in the art are taking place or where the industry is growing at a rapid rate, taxes and interest on an amount sufficient to produce a modern plant and facilities for furnishing the equivalent service in an efficient and economical manner; such amount not being limited to simply the cost of the physical structure but including all costs incident to organization before and after the physical structure is functioning, and in addition thereto, generally, losses incurred during early operation which are more or less inherent in every form of business activity and are characteristic of public utilities. To this cost should be added a profit in sufficient amount to induce capital to flow into the industry.

In the findings of fact as to value no investigation was made of whether the property had in any measure been built up from past earnings or from money furnished from other sources, such as the sale of securities. This follows the ruling of the Board of Public Utility Commissioners in the Passaic Gas Case, approved by the Court of Errors and Appeals of New Jersey, which states that "deferred regulation is no excuse for refusing at present to allow a fair return upon what is the lawful property of the company."

Value is defined as the desirability or worth of a thing as compared with the desirability of something else; often confused with the qualities and circumstances on which, taken together, such desirability depends. The economic concept of value is definite and can have but one meaning, whether it is value for condemnation purposes, value in a confiscation case, value for rate making purposes or value for barter and exchange. This conception of value was recognized by the Supreme Court of the United States in 1894 in a decision rendered by Justice Brewer in Regan vs. Farmers Loan & Trust Company.

The value of an ordinary freely competitive commercial or industrial enterprise is dependent upon the value of its product or service. The engineers make a distinction between a freely competitive industry and a monopolistic organization, in which latter class public utilities were said to belong.

These more or less monopolistic enterprises, such as public utilities, instead of being regulated by the economic law of supply and demand, are kept in check by artificial restraints of the law. If the regulation proceeds to a point where the return permitted the property devoted to public use is less than that available for money invested in a competitive and unregulated industry (safety of investment being equal), value is impaired and property is taken without just compensation and the public service is itself injured as the extension of facilities is curtailed.

There is not much probability, at least in the near future, that prices for labor and material will revert to anywhere near the pre-war basis and consequently due consideration was given to existing prices in computing the value of the property. Taking cognizance of the present prices was in line with recent New Jersey decisions.

In conclusion the report stated that while an estimate of the amount of superseded property and non-operative property had been made, such allowance was not included in the final figure. Superseded property should be given consideration in the fixing of future rates if investigation proves that past rates fixed by regulation had been inadequate to give a fair return over reasonable allowances for obsolescence caused by the growth of business or changes in the art.

The property of the Railway Company was found to be on the whole well maintained except in a few instances where the physical property was not in the best operating condition, but where the condition can be remedied by the expenditure of a comparatively small sum. It was the opinion of the engineers that it would be impossible to produce a theoretical modern plant at very much less than the cost of reproducing the existing plant of the Railway Company. An analysis of the operating statements submitted by the company and a comparison with those of other street railways indicated an efficient operating organization. The report drew attention to certain economies which might be effected in several departments of the company, which would somewhat reduce operating expenses. These economies, it was added, were all given due weight in the engineers' conclusions as to the operating efficiency.

	Labor and Material	
Elements as of Jan. 1, 1921	Average Pre-war Prices	Sept 1, 1920 Prices
Reproduction cost new of the property as a going concern	$88,815,887	$189,489,560
Accrued depreciation of the physical property	14,922,144	33,646,737
Minimum value of power lease	11,194,000	19,149,000
Reproduction cost of property not used in operation	....	645,593

New Jersey Valuation Act Amended

The valuation act of New Jersey under which the preceding report was made provided that the valuation so found should be accepted as final for rate-making purpose, no means for review being included in the act. Mainly because of the lack of any review provision Governor Edwards vetoed the measure. It was promptly repassed over his dissent. Agitation was kept up for the inclusion of some means of review in the measure and at the present session of the Legislature the act of 1920 was amended so as to provide "that such valuation shall be subject to review on certiorari." Provision is further included now for cross-examination by representatives of the municipalities and others before the Board of Public Utility Commissioners of the authors of any such valuation. Hearings on applications for rate increases for electric railways are also to be given preference in their consideration over matters of routine pending before the commission. The amendments have been approved by the Governor.

Governor Urges Valuation Based on Earning Power

Governor Miller of New York has discovered that the transit relief legislation passed at his behest does not guard the public interest sufficiently in the provision which it makes for transit valuations. In consequence he rushed to the Legislature on April 13 a special message on this matter urging haste in the enactment of the amendment to the so-called Knight-Adler law now suggested as the law-making body is to adjourn within a few days.

The emergency message was one of more than 1,000 words. The Governor said in part:

> The ordinary standards of physical valuation, either original or reproduction cost, less depreciation, do not meet the emergency with which we have to deal, and physical valuations, according to any standard that could be prescribed, will in most cases under existing conditions be grossly unfair to the public.
>
> It is very difficult to prescribe by statute a standard of principle of valuation that will be fair and not too inflexible. I fear in the absence of any other prescribed standard the statute as it now stands will be construed as contemplating a valuation based on physical values which, as I have said, may prove to be grossly unfair to the public.
>
> Applied to the matter in hand the valuation should be based on the estimated prospective earnings at the fare in each case which the company is permitted to charge under its franchise or contract with the city, the valuation in no case to exceed the original cost or the fair reproduction cost less depreciation of the utility property which is necessarily employed in the public service.
>
> Of course, I construe *fair* reproduction cost to mean such cost under normal, not abnormal, conditions.

The Senate on Wednesday passed, unanimously, a bill which provides, in part, that:

> Such valuation shall be made with due regard to the estimated prospective earning capacity of the property necessarily used in the public service at the rate or rates of fare that the company prior to the taking effect of this act was entitled to charge.

Traffic and Transportation

Winnipeg Fare Upheld

Appeal Court Unanimous in Its Finding Upholding Rights of Public Utilities Commissioner

The right of the Winnipeg (Man.) Electric Railway to charge higher fares as ordered by the Public Utilities Commissioner was sustained by the Appeal Court of Manitoba on April 4. The decision of the Appeal Court was unanimously in favor of the company on all points. Because of its sweeping and definite nature the ruling practically ends litigation arising out of the higher fares which has been pending for more than two years. The judgment is also of far-reaching effect because in several of the provinces in the Dominion of Canada there are public utility commissions.

Immediately after the judgment had been rendered the Winnipeg City Council discussed the situation and passed a resolution favoring a plan to enter into immediate negotiations with the Winnipeg Electric Railway, while at the same time authorizing the city solicitor to carry the appeal against the judgment of the Appeal Court to the Privy Council.

It is interesting to note that for some months past A. W. McLimont, vice-president of the Winnipeg Electric Railway, has been endeavoring to negotiate with the City Council with a view to settling the transportation problem in Winnipeg permanently. Alternative suggestions proposed by the company to the City Council will now form the basis of negotiations. They follow:

1. The city taking the street railway at the present time.
2. Agreeing upon the terms under which the company shall operate for the remaining period of the franchise.
3. Making an entirely new agreement, based upon service-at-cost or some similar arrangement, in which the profits of the company shall be limited and the fares to go up or down as the cost of operation increases or decreases. The control of this form of operation might be by a commission composed of representatives of the city and the company with an independent chairman.

Briefly reviewing the situation in Winnipeg it might be stated that in the fall of 1918 the company was faced with a serious financial situation on account of increased operating costs and then applied to the City Council for leave to increase fares over those stipulated in the franchise under which the company was operating.

The City Council referred the company to the Public Utilities Commission, and two interim orders were issued by the commission which also made exhaustive valuation of the company's property. This investigation extended over two years and included a complete valuation of the company's physical assets, while the company's financial history also came under review. At the end of the investigation the commissioner made a final order raising the fares as follows:

Cash fares 7 cents.
Four tickets for 25 cents.
School children seven for 25 cents.

The city appealed against this order to the Court of Appeal.

By the terms of the order allowing the appeal to be taken the point submitted to the Court of Appeal was limited to the following question, viz.: Had the Public Utilities Commissioner the necessary authority to make the order raising the fares in so far as it affects the city of Winnipeg? Provided, that on the said appeal no question should be raised or argued as to the constitutional validity of the public utilities act, or as to the validity of the appointment of the said commissioner to his office.

The controversy between the city and the company as to the public utilities act involved two questions:

1. As to whether it was within the powers of the province to enact such legislation.
2. Whether upon the construction of the act as passed, assuming it to be within the powers of the province to pass it, the commissioner had power to change the fares fixd under the franchise agreement between the city and the company. The question before the Court of Appeal in the present instance was limited to the second of these two questions, the question as to the constitutionality of the act being eliminated.

The Court of Appeal has now unanimously decided the second question by upholding the powers of the Public Utilities Commissioner to change the fares fixed by the franchise agreement.

Boston Elevated Permitted to Run Buses

The Massachusetts Department of Public Utilities has granted its approval to the petition of the Boston (Mass.) Elevated Railway for the right to own and operate auto buses for the transportation of passengers and freight. Under the Massachusetts laws, any company desiring to operate motor buses for passenger transportation must first obtain the general approval of the Department of Public Utilities and is then obliged to secure a license from the city or town in which it proposes to operate.

The Boston Elevated desires to substitute the buses for street cars on Market Street, Brighton, a part of the city of Boston, and it will therefore proceed to petition the Boston City Council for the necessary license. The company, faced with the necessity of reconstructing its track for about 1½ miles on Market Street, where the traffic is comparatively light, decided to seek permission to abandon the track and operate the buses.

Fare Extension Accepted

Company at Columbus Hopes to Be Able to Meet $3,000,000 Improvement Program

The Columbus Railway, Power & Light Company, Columbus, Ohio, has accepted the ordinance recently passed by the City Council which assures it of a continuance of the present rate of fare, authorized more than a year ago, of 6 cents cash, or five tickets for a quarter. This action was taken by the board of directors of the company on April 7 following a period of several weeks' consideration of the Council's ordinance authorizing extension of the present tariff.

Under this ordinance the company may charge the present rate of fare during the remainder of the life of the blanket franchise under which it is now operating. This terminates April 3, 1926. Under the temporary increase granted more than a year ago the company was authorized to increase the then existing fare of 3⅛ cents, with eight tickets for a quarter, to 6 cents, with five tickets for a quarter, for a period ending April 3, 1922. The new legislation accepted by the company, therefore, extends the higher rate four years.

The extension was granted on the company's showing that to return to the old rate would not only compel operation at a loss, but would preclude all possibility of restoring the financial credit of the company and prevent the carrying out of improvements and extensions demanded of it under the existing franchise.

Demands of the Council for improvements during the remainder of the franchise period, in exchange for the continued high rate contemplate a program of betterments and extensions involving a cost of $3,000,000. The directors are still somewhat dubious as to their ability to make good on this consideration, but it was decided to accept the ordinance and make the best of the situation, with the hope that conditions will get better and allow the company to make a sufficient profit to permit it to meet the demands and at the same time assure itself of an adequate credit.

Company officials have assured the men that there will be no reduction in present wages, fixed by a board of arbitration about a year ago.

Seven-Cent Injunction Upheld

Judge Evans of the United States District Court, Louisville, Ky., has refused to hear that city in the matter of dissolving the temporary restraining order preventing interference with the Louisville Railway's 7-cent fare, stating that he would entertain no motions until the United States Court of Appeals decides the case.

The city will not seek to enforce penalties for collection of 7-cent fares as provided for in the Statutes of 1869 and will not take any action against the Louisville Railway other than to file a suit in the state court to enforce the contract of the company with the city.

This announcement was the one City Attorney Lawton and his assistant, W. T. Baskett, planned to make had they been allowed by Judge Evans to make a motion to dissolve the 7-cent injunction.

The city contends that the injunction hangs on the ground that the city might enforce the penalties against the company. Claim was made that the question of contract should be tried out in a state court, it having no place in a federal court.

Fares Reduced 50 per Cent

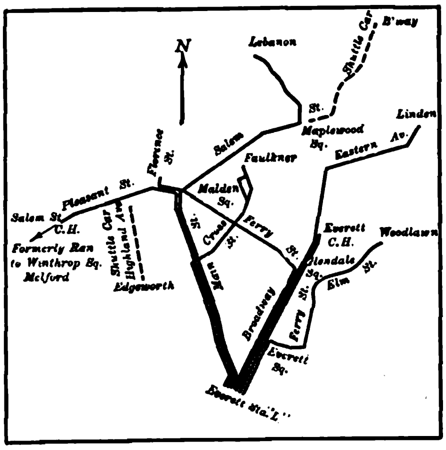
The Boston (Mass.) Elevated Railway on March 26 established a 5-cent local fare in Everett and Malden on the seven surface routes feeding the terminal of the elevated line at Everett, shown in the accompanying map.

SERVICE ON BOSTON ELEVATED RAILWAY FROM EVERETT STATION

Surface Route	Length of Route (One-Way Distance) Miles	Week-Day Schedule Cars Nor.	Week-Day Schedule Cars Rush	Week-Day Schedule Headway Nor.	Week-Day Schedule Headway Rush	Sunday Schedule Cars	Sunday Schedule Headway
Lebanon St.	4.099	5	11	10	5	5	10
Salem St., C. H.	3.405	5	15	10	3	5	10
Florence St.	3.348	5	5	10	10	5	10
Faulkner	2.665	3	7	15	6	3	15
Everett, C. H.	1.948	2	11	20	3	..	..
Linden	3.535	2	6	20	7½	5	10
Woodlawn	2.519	3	7	12	6	3	15

Some idea of the service rendered and the length of the rides possible for the 5-cent fare are given in the accompanying table.

The Highland Avenue and Salem Street routes are changed to stub and shuttle routes instead of running to the terminal as heretofore. On these routes Brill single-truck safety cars are operated on a thirty-minute headway during normal hours, and on a 20-25 minute headway during rush hours.



EVERETT AND MALDEN 5-CENT FARE DISTRICT

Freight Delays Penalized.—The Public Service Commission of Indiana has authorized all interurban companies operating in Indiana to increase freight storage rates 1 cent a pound for every twenty-four hours. The increase was made as a penalty to cause shippers to move goods promptly.

Five-Cent Fare Denied in San Antonio

United States Supreme Court Holds that a Confiscatory Rate There Will Not Stand as City Did Not Have Franchise Power

In the case of the city of San Antonio vs. the San Antonio Public Service Company, the Supreme Court of the United States on April 11 affirmed the action of the lower court in enjoining the city of San Antonio from enforcing a 5-cent fare against the San Antonio Public Service Company. The decision is regarded as far-reaching in its consequence in Texas at least.

THE lower court contended and the Supreme Court concurs that the right to enforce such a rate was not secured by the city by contract and such enforcement was beyond the power of the city because it would mean the confiscation of the property of the railway which would result in violation of the fourteenth amendment of the Constitution of the United States.

In March, 1899, the City of San Antonio by ordinance extended to July 1, 1940, the franchise of the San Antonio Gas Company, the Mutual Electric Light Company, the San Antonio Street Railway and the San Antonio Edison Company. The ordinance provided, among other things, that the two last-named companies which operated railways in the city were to charge a 5-cent fare for one continuous ride over any one of their lines with one transfer to or from either line to the other.

In April, 1900, all the property of the two railway companies was sold under a decree of a state court to the San Antonio Traction Company, and that company with the approval of the city thereafter controlled and carried on both lines.

In 1903 the state enacted a half-fare law making it the duty of the traction company to carry school children and students for half fare and subsequently an ordinance was passed by the city in furtherance of this law. The company refused to carry out this legislation on the ground that it impaired the obligation of its contract as to the rate of fare resulting from the city ordinance of San Antonio of 1899 in violation of the state and Federal constitutions.

A suit by mandamus to compel it to do so was begun by an individual, and from a ruling adverse to the company's contention, the case was taken to the Court of Civil Appeals. That court held that it was unnecessary to consider whether the rate requirement was a contract because it was adopted long after the provision of the state constitution that "no irrevocable or uncontrollable grant of special privileges or immunities shall be made."

The final decree just rendered enjoins the city from interfering with the complainant in substituting a 7-cent fare and besides enjoins the city from enforcing the various ordinances complained of in the bill prohibiting and punishing the charging of a higher rate than 5 cents. The decree, however, reserves the right to the city to ask relief whenever, because of a change in conditions, the 5-cent fare should cease to be confiscatory. In addition the enforcement of the city ordinance imposing the half-fare rate for school children was enjoined, although the continued enforcement of the state half-fare law, which had been upheld, was expressly declared by the Supreme Court not to be restrained.

Continuing the opinion says:

> That in view of the admitted fact of confiscation the court had power to deal with the subject is too clear for anything but the statement. And we think it is equally clear that the right to regulate gives no power whatever to violate the constitution by enforcing a confiscatory rate, a result which could only be sustained as a consequence of a duty to pay such rate arising from the obligations of a contract, it follows that the solitary question to be considered is whether a contract existed empowering the city to enforce the confiscatory rate.
>
> Primarily the answer to that question must depend upon whether the ordinance of 1899 fixing the 5-cent rate was a contract. That it was not and could not be, we are of opinion, is the necessary result of the provision * * * of the state constitution, which existed in 1899, prohibiting "any irrevocable or uncontrollable grant of special privileges," when considered in the light of the irrevocable and uncontrollable elements which must necessarily inhere in the ordinance of 1899 to give it the contract consequence relied upon. * * *
>
> The fact is that all contentions of the city as to obligation of contract as to the 1899 rates illustrate the plainly erroneous theory upon which the entire argument of the city proceeds; that is, that limitations by contract upon the power of government to regulate the rates to be charged by a public service corporation are to be implied for the purpose of sustaining the confiscation of private property.

Increase Asked in Workingmen's Fare

An increase of 80 cents a month in the fare for Rock Island arsenal workingmen has been asked by the Tri-City Railway, Davenport, Ia. The men have been buying tickets for $2.80 per month, good to and from the arsenal as many times a month as their work there requires.

Figured on the basis of twenty-six working days a month, the average number, and two rides a day, the new fare schedule petitioned for would be approximately 7 cents a ride. This increase is proportionate to the raise from 7 to 9 cents on city lines in Davenport, Rock Island and Moline.

Franchise Rate Valid

The Iowa Supreme Court Decision Affects Both the Des Moines and Ottumwa Railways

The railway question at Des Moines, Iowa, has been thrown wide open again with the dismissal last week on motion of the Ottumwa Railway & Light Company of its appeal to the Iowa Supreme Court on the fare case at Ottumwa. The Ottumwa case is expected to have a direct bearing upon the rate in Des Moines by reason of the fact that Judge Martin J. Wade, of the Federal court, in granting the receivers for the Des Moines City Railway the 8-cent fare ruled as follows:

> If the Supreme Court of this State changes its former decision and holds a franchise rate valid this fare will be changed. The court will bow to the highest court of this State as it did in the 6-cent fare decision.

By its dismissal of the appeal the Iowa Supreme Court wiped out its previous decisions, and the legal battle is restored to the District Court, which previously upheld the city of Ottumwa in its contention that a 5-cent fare should be charged.

ALLOWED TO INCREASE RATES AS A WAR MEASURE

The Ottumwa case has dragged along in the courts for several years. The Ottumwa franchise provided for a 5-cent fare, but as a war measure the City Council allowed the company to charge 6 cents. With the coming of peace the city sought to restore the 5-cent fare, which was objected to by the Ottumwa Railway & Light Company on the ground of increased costs. When the case was appealed to the Supreme Court that tribunal sustained the ruling of the lower court, but on a rehearing the higher court reversed itself. The city then asked a new hearing and the dismissal of its case was asked by the Ottumwa Railway & Light Company.

Attorneys for the city of Des Moines state that as soon as possible they will make formal application to Judge Wade for an order restoring the 5-cent fare in Des Moines.

The Des Moines City Railway, through A. W. Harris, of the Harris Trust Company, which controls the company, has announced that unless the bus competition is eliminated the company will soon have to suspend operation. Mr. Harris made the above statement to the Greater Des Moines committee in proposing a service-at-cost feature of a new franchise proposal. The Greater Des Moines committee agreed to sponsor the movement and efforts were made to bring about a meeting of the City Council and attorneys and officials of the company. However, Mayor Barton declined to accept the invitation of the Greater Des Moines committee unless the meetings were in the City Council chamber and were open to the public. To date not progress has been made.

The battle between the buses and the electric railway is going on merrily in the meantime and each side is using newspaper advertising in an effort to place its story before the people.

Ten-Cent Fare Plea Heard

The hearing on the application of the Trenton & Mercer County Traction Corporation, Trenton, N. J., to increase its fares from 7 cents to 10 cents was begun before the Board of Public Utility Commissioners on April 5. Rankin Johnson, president, stated that interest on bonds was defaulted on April 1 and that there are no funds with which to pay interest falling due on May 1. He said that in consequence there was a possibility that ninety cars serving as security for the bonds would be seized by the trustees under the mortgagee, leaving only thirty cars with which to maintain schedules. Mr. Johnson insisted that unless assistance is forthcoming immediately the system will have to pass into the hands of a receiver.

Even with an increased rate, Mr. Johnson said, the receipts of the corporation would fall approximately $50,000 short of the sum required to meet expenses for the first year. He thought a higher fare would result in a falling off of not more than 5 per cent in the number of passengers, and that this would be but temporary.

Although the system is not confronted by jitney competition, Mr. Johnson declared that the receipts were undoubtedly affected by what he characterized as "private automobile competition." He testified that the corporation enjoys the advantage of a wage agreement slightly lower than that under which the Public Service Railway is working and also less than that prevailing in other cities similar in size to Trenton.

Transportation News Notes

Special Mid-day Fares Help Traffic.—It is announced that the cheap mid-day fares on the London County Council Tramways have so stimulated traffic as to produce substantial financial benefit.

Seeks Higher Fare.—The Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis., has applied to the State Railroad Commission for permission to increase its lighting, power and street car rates.

City Proud of Its Five-Cent Fare.—Cars of the Lincoln (Ill.) Municipal Railway are to carry placards announcing a 5-cent fare, primarily for the edification of the visitor to that city as an advertisement of economical management of a municipal enterprise.

Railway and Jitney Schedules Articulated.—The Board of Aldermen of Dover, N. J., has passed an ordinance compelling jitney operators to pay a license fee of $100 a year and to arrange schedules so they interpolate those of the Morris County Traction Company.

Ferry-Railway Transfers Urged.—David W. Henderson, superintendent of the Seattle (Wash.) Municipal Railway, has refused to commit himself as to what the attitude of his office would be regarding the matter of entering into an agreement with the operators of the Elliott Bay ferry to West Seattle for the exchange of transfers from the cars to the ferry and from the ferry to the cars. A petition signed by several hundred citizens of West Seattle urges that the city take action to secure a transfer arrangement in order that the ferry, which is now losing money, may continue to operate.

Denver Tramways Seeks Fare Increase.—Application for a 20 per cent increase in interurban fares has been made by Ernest Stenger, receiver of the Denver (Col.) Tramway, to the Colorado Public Utilities Commission. The increased fares would affect traffic on the Denver-Golden and Denver-Lyden lines. In his petition to the commission Receiver Stenger points out that the increase would make the tramway fare to Golden the same as is now charged on the Denver & Intermountain line. Since Aug. 6, 1918, when the commission granted the city tramway a 7-cent fare, it has been charging 7 cents on its interurban lines.

P. R. T. Asks Continuation of Present Fare. — The Philadelphia (Pa.) Rapid Transit Company has filed at Harrisburg an application with the Public Service Commission for a continuance of the four-ticket-for-a-quarter tariff now in effect. If the request is granted, the present rates of fare would be continued after May 1, fixed as the time limit for the present tariff granted by the commission on Nov. 1. Valuation proceedings now under way will, it is expected, be completed within three months. The value fixed will determine the amount of returns to which the company is entitled and in that manner, will also fix the permanent rate of fare to be charged by the company.

Injunction Against Jitney Ordinance Denied.—Judge Hall at Kansas City, Mo., has refused to grant a permanent injunction restraining the enforcement of the ordinance prohibiting jitneys from operating on streets where electric railway cars are run. Jitneys began operating on April 7 over new routes away from rail lines. These routes took the jitneys through Eleventh Street, known as Petticoat Lane, the chief east and west shopping street. Merchants protested against congestion on this thoroughfare and Mayor Cowgill immediately ordered the jitney inspector to change this routing, and by noon jitneys were eliminated from that street. The Kansas City Railway had extra cars in service and speeded up schedules in response to the new conditions.

Personal Mention

Joins Consulting Firm

Mr. Litchfield, Formerly Engineer of the American Car & Foundry Company, Joins Gibbs & Hill

Norman Litchfield, who for the last three years has been mechanical engineer of the American Car & Foundry Company, New York, has resigned to join the staff of Gibbs & Hill, consulting engineers. He will devote special attention to electric locomotive and car equipment work. This will not be Mr. Litchfield's first experience in consulting work, for at one time he worked under L. B. Stillwell in the preparation of plans for the equipment of the New York subways.

NORMAN LITCHFIELD

During the period that experimental work was being carried on by Mr. Stillwell with the cars that had been designed for the subway Mr. Litchfield had charge of the tests. When the operation of the subway began he joined the engineering staff of the Interborough Rapid Transit Company, with which he was connected for a good many years. Previous to his association with Mr. Stillwell he served his apprenticeship in electric railroading in the shops of the Brooklyn Rapid Transit Company. He was graduated from Stevens Institute of Technology in 1901 with the degree of mechanical engineer.

Mr. Litchfield has been a very valuable contributor to the JOURNAL. He has written a great many articles on technical subjects dealing particularly with the fundamentals and details of car bodies and truck construction. In 1920 the JOURNAL began the publication of a series of articles by Mr. Litchfield on railway car materials. These were written with the idea that the ordinary mechanical man of a railway is confused when seeking specific information by the vast amount of material confronting him. It was also felt that a better understanding of the characteristics of various materials used in car construction would result in simpler and more uniform specifications being drawn up for car builders, and in this way cause a step toward standardization to be taken to effect greater economies in materials and cost.

Mr. Litchfield has been actively interested in the work of the American Electric Railway Engineering Association and served as its secretary for a number of years. He is also a member of the executive and standards committees of the association.

Los Angeles Railway Has an Official Question Target

George E. Ferguson has been made special representative of R. B. Hill, superintendent of operation of the Los Angeles (Cal.) Railway. This is a new position which has been created so that there might be some one to help the trainmen in their work.

Mr. Ferguson will go from one division to another unannounced and at different times of the day to talk over with the trainmen in an informal way any of the points about which they may wish to question him. In this capacity he will also meet the men around the assembly room and discuss service with them on their own ground instead of over a desk top. This method, it is hoped, will give a personal touch under which everyone will feel free to discuss matters for the betterment of service.

Mr. Ferguson has been with the Los Angeles Railway since 1905, and has served in practically every section of the operating department. This experience makes him well able to give correct information on questions pertaining to any phase of a trainman's work. At the time of his appointment Mr. Ferguson was in the schedule department.

Mr. Trazzare, Publicity Manager of Georgia Railways, Resigns

J. F. Trazzare, manager of publicity department of the Georgia Railway & Light Company, Atlanta, Ga., severed his connection with the company on April 1. This was occasioned by the reorganization of some of the work of the company along the lines of publicity, safety and employment, all of which had been under Mr. Trazzare's direction. In the interests of economy the company has discontinued these as separate departments. The safety work of the company has been placed under the direction of F. L. Butler, the new general manager of railways.

Up to the present time no definite publicity organization has been effected. Meanwhile the publicity work of the company will be handled by Mr. Atkinson, chairman of the board of directors, and Mr. Arkwright, president of the company.

W. R. Dunham, Jr., Resigns

Former Connecticut Company Engineer Joins Construction Firm of Engel & Hevenor

William R. Dunham, Jr., resigned as engineer of maintenance-of-way of the Connecticut Company, New Haven, Conn., on April 15 to become chief engineer for the firm of Engel & Hevenor, contracting engineers, New York City, and for H. P. Hevenor, a member of the firm, in his private engineering practice.

W. R. DUNHAM, JR.

Mr. Dunham is rounding out thirty years of engineering work in the electric railway field, which he entered as a student in an engineering office in Providence, R. I., where work was done for the Union Railroad, a horse railway of that city. When the railway organized its own engineering department Mr. Dunham joined it, and as the system developed he was rapidly promoted. When, in 1893, the Union Railroad was merged in the United Traction & Electric Company he became principal assistant in track matters.

In 1902, when the United Gas Improvement Company took over the Providence property and formed the Rhode Island Company, Mr. Dunham's duties were radically changed for a time. Due to his familiarity with the layout of the property he was assigned to develop a system of transfers, for which purpose a new department was formed. However, two years later he went back with the engineering department in charge of all civil engineering matters.

In 1906 Mr. Dunham went to New Haven to become assistant engineer in the maintenance-of-way department of the Consolidated Railway (now the Connecticut Company), becoming engineer of maintenance-of-way in July, 1914, which position he has held ever since. In this position he did most valuable construction, maintenance and valuation work. Recently he was an appraiser of the property of the Shore Line Electric Railway, Norwich, Conn., and also assisted the Public Utilities Commission of Connecticut in valuation work.

During his engineering career Mr. Dunham has taken an active part in the affairs of engineering and other associations. He has been a member of the American Electric Railway Association since 1915, and was president of the Connecticut Company local section of that association. He has been a member of the A. S. C. E. since 1906, and was chairman of the committee which formed a local section of that body. He is a past-president of the Connecticut Society of Civil Engineers. He is also an active member of the American Association of Engineers, of the New Haven Railroad Club, and of the New England Street Railway Club. In leaving the operating railway field Mr. Dunham will have occasion to keep up his affiliation with most of these organizations, for the firm of Engel & Hevenor does much electric railway construction work.

No successor to Mr. Dunham will be named for it is intended to leave his former position vacant indefinitely. The three division engineers who formerly were required to report to him as engineer of maintenance-of-way will now be responsible to General Manager J. K. Punderford.

R. S. Moore has resigned as vice-president in charge of the New England investment business of the Byllesby Engineering & Management Corporation.

J. W. Ellingson, traffic manager of the Utah-Idaho Central Railroad, Ogden, Utah, resigned March 1, to become traffic manager of the Amalgamated Sugar Company.

J. M. Martin has been appointed auditor for the Piedmont & Northern Railway, Charlotte, N. C., to succeed Bond Anderson, who resigned April 1 to engage in private business. Mr. Martin has been head bookkeeper in the office of the Piedmont & Northern for the past several years, and will have charge of the general auditing of the company.

Edward M. Moore has been appointed by Director Twining as private secretary to the director of the City Transit Department of Philadelphia, Pa. The former private secretary to the director was John Egan. He resigned many months ago and no appointment was made to the vacancy until the choice of Mr. Moore, who is a son of Mayor Moore of Philadelphia.

C. W. Loughry will succeed Frank P. Litschert as secretary of the Public Service Commission of Indiana on May 1. The new secretary is a graduate of Indiana University and the Indiana University Law School. Mr. Litschert, who will retire as secretary of the commission, was private secretary of ex-Governor Goodrich and his appointment to the service body place was a temporary one following the resignation of Carl Mote at the end of the Goodrich administration.

Hilding Angstrom, chief engineer of traction lines of Malmoe, Sweden, a city of 150,000, was in Terre Haute, Ind., recently inspecting the Terre Haute traction plant and system, and giving special attention to the little green cars. He said to E. M. Walker, general manager: "I came to Terre Haute for the reason that I was told that progressive traction methods are being worked out here. Your shops and plants show efficiency, even by a casual visit. I believe the small cars are the traction solution for short hauls and for lines which do not encounter trying topographic and other hard conditions."

A. P. Patterson, appointed acting general superintendent of the railway department of the New Orleans Railways & Light Company, New Orleans, La., to fill the vacancy caused by the resignation of N. H. Brown, entered utility work in 1905 as general manager of the street railway, electric and gas properties in Meridian, Miss. He remained there until December, 1917. From 1910, when Henry L. Doherty & Company purchased these properties, until he left the Doherty interests, he was called upon to make examinations and valuations of a number of other properties. During 1918 and 1919 Mr. Patterson was engaged in a private engineering business which, on Jan. 1, 1920, he sold to accept a position with J. K. Newman, New Orleans, La., chairman of the bondholders' committee of the American City Company, New York. Through that connection he was assigned certain duties with the New Orleans Railway & Light Company and upon the resignation of N. H. Brown, was appointed acting general superintendent of the railway department.

Obituary

Warren G. Bristol, Manager

Warren G. Bristol, manager of the Hartford lines of the Connecticut Company, is dead. His body was found in Keney Park, Hartford, Conn., with his temple pierced by a revolver bullet. His death came as a great shock to the community and to his many friends, for Mr. Bristol was highly appreciated both as a man and for his ability as a railway manager. His associates had the highest regard for him. He was extremely popular among the employees and knew hundreds of trolley crews personally.

Not long ago, before a public gathering, he expressed great faith in the future of the electric railway. At that time he said:

> I have devoted my life to the trolley business, and it might appear to some as if in the later years of my life I might be discouraged at the outlook, but I look for a re-establishment of the trolley companies in the public favor, and do not believe the time has come or will come in the near future when jitneys and motor buses will take the place of the trolley systems. There is such an urgent need for trolleys to obtain the development of outlying district that I think within a few years there will be a great expansion of the trolley lines.

Mr. Bristol's first affiliation with street railways dates from October, 1893, when he was engineer of the construction crew which was engaged in building the trolley line between Meriden, Conn., and Wallingford. At that time he was under Norman McD. Crawford, who is now vice-president and treasurer of the Columbus Railway, Power & Light Company, Columbus, Ohio. When the line was completed he remained at Meriden as assistant to the superintendent and a year later, when the road was purchased by the New York, New Haven & Hartford Railroad Company, he himself became superintendent.

For about ten years Mr. Bristol was superintendent of the lines in the vicinity of Meriden. His career there was marked with success and when the opportunity offered itself in February, 1906, his superiors transferred him to Hartford as manager of the local lines covering a territory of 164 miles. It was this position that he held at the time of his death to the mutual satisfaction of city and company officials and the traveling public.

Some years ago he showed himself possessed of inventive genius and, in the interests of his company, developed and perfected the four-section stone and dump car, which is known as the Bristol multiple-body dump car. This type of car is used extensively on the Connecticut Company's system for the quick transportation and disposition of crushed stone, gravel and earth. Because of the compartments and mechanical devices for dumping, it makes possible the discharging of loads along the trolley routes where construction or repair work is in progress without delaying passenger traffic.

Mr. Bristol was born in Cheshire, Conn., on April 21, 1873. He received his early education in that town and was afterward graduated from the Yale Business College in New Haven, Conn. He was popular in railway circles, having served as vice-president of the New England Street Railway Club for one year and, in November, 1917, was elected president of the Connecticut Company Section No. 7, A. E. R. A.

Ferdinand O. Reed, chief ticket clerk of the Portland Railway, Light & Power Company, Portland, Ore., for the last eight years, died suddenly in that city on Feb. 18.

J. J. Swan, who had held the position as chief of the appointment bureau in the transportation department of the New York (N. Y.) Railways, died recently while on his way to his office. Mr. Swan was well known in and about New York City because of his long service with that company, which extended over a period of thirty-nine years.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Brake Shoe Prices About $12 Less per Ton Since Jan. 1

Market Is Quiet with Producers Making Prompt Deliveries and Curtailing Present Good Stocks

The market for brake shoes presents much the same features as other railway equipment lines at this time. Stocks of finished material are large—too much so for a declining market, and producers are therefore following a retrenchment policy on production. Deliveries are, of course, immediate.

Buying for the most part is for immediate needs only and though the outlook seems to be that the brake shoe market has passed its lowest point and hence is somewhat optimistic in tone, there does not seem much chance that sales will equal those of last year. It is quite possible that a good demand will develop this fall, however. The replacement of wornout brake shoes, which is undoubtedly the chief factor in buying, has been one of the points upon which railways, especially steam, have economized. Many of the large number of idle freight cars on steam roads have been stripped of brake shoes, it is reported, to care for the rolling stock in actual operation. In the electric railway field this condition is of course not true and there the buying is said to be proportionately greater, some traction companies carrying from a two to three months' supply.

The second reduction this year in brake shoe prices was recently announced by one of the leading interests. The cut, which was effective April 1, was in the same amount as the previous decrease of Jan. 1, or about 8½ per cent. This is equivalent to a drop of $6 per ton. The further price trend is largely dependent on malleable iron and labor costs, though it should be remembered that brake shoes have been advanced in price since before the war less than almost any other item of railway equipment.

Electrical Exports for February Hold Up Well

February's electrical exports, although they were $2,000,000 under those of January, a record month, amounted to $13,632,478. Last October the exports took a decided jump of more than two million and in November went over the ten million mark. December was over thirteen millions, January was over fifteen millions and February is holding up well.

Total exports of January and February amount to $28,965,433. It took four months of last year to approach this figure. The year 1916 was the first year to bring in total exports higher than those of the first two months of 1921, which were nearly thirty millions. Last year's total was $102,618,508, and if 1921 continues at its present rate the total will yield over $170,000,000. With all the slump in the general exporting market it appears that the electrical industry is holding up its end of the game in a very encouraging way. American electric railway products have always held an important place in supplying South American markets especially.

Corporation Reduces Prices on Many Steel Products

Effective Immediately, Prices Are from $1.50 to $15 a Ton Lower Than Former Schedule, a Decrease of from 3.8 to 17 per Cent

Effective at once a reduction in prices of many steel products ranging from $1.50 to $15 a ton was announced on Tuesday by Judge E. H. Gary, chairman of the Board, for the United States Steel Corporation. This supersedes the schedule to which the corporation has been adhering since its approval by the Industrial Board in March, 1919. Reductions on tubular goods and on sheets, it is stated, have not been completed and will probably be announced within the next few weeks. Steel rails and wire nails are unchanged.

In comparison with the former schedule the new prices effect a reduction of $9 a ton in plates, $5 a ton in structural steel, $5 in bars, $9 in wire rods, $7 for plain wire, $8 for sheet bars and small billets, $4 for slabs, $1.50 for 4 x 4 and heavier billets and $15 a ton for tin plates.

Independent mills have until last winter been holding to a schedule higher than that of the corporation, but last November a downward trend commenced in hope of stimulating business. Although this finally brought independent prices below those of the corporation it also brought little new business. It has been a common expression among the trade that a reduction in price by the leading interest would prove a stimulant not only to the steel industry but also to all industry, and particularly to building. It remains to be seen now what effect this cut of late last Tuesday will have.

No statement was made that wages in the corporation mills would be reduced in line with the prices of steel but it is believed in many quarters that this action will be taken in the near future.

Ten per Cent Reduction on Line Hardware

Manufacturer's Decrease of 7½ per Cent Passed on at Higher Figure by Jobbers

Pole-line hardware prices have again taken a drop. The reduction as announced by a leading manufacturer, effective April 11, amounts to about 7½ per cent, but this cut has been passed on by jobbers and distributers on an average of about 10 per cent. Other manufacturers are expected to follow suit in reducing quotations.

Prices quoted to electric railways and central stations by jobbers on representative material, f.o.b. Chicago, are as follows: Carriage bolts, ⅜ in. x 4½ in., $2.25 per 100, compared with $2.45 previously; cross-arm braces, 1¼ in. x ¼ in. x 28 in., $13.25 per 100 as compared with $15; machine bolts, ⅝ in. x 12 in., $9.95 per 100 as against $11.15. Lag screws, 1½ in. x 4 in., are now priced at $4.25. General price reductions of from 5 to 7½ per cent were made on line hardware the middle of last February, and previous to that decreases of 5 to 15 per cent had been made during December and early January, so this is the third decided reduction in hardware prices that producers have made.

In general consumers have not entered the market very actively this spring, although demand from power companies is said to be increasing recently. As a result of the quiet market producers are only operating at from 50 to 75 per cent of capacity. Reserve stocks are sufficient to care for all immediate needs with prompt shipments.

Crossarms Drop Ten per Cent in Price

The Third Reduction Which Has Been Made This Year Should Provide Stimulus to Buying

Following the price reduction of 9 to 15 per cent on Rainier fir and longleaf yellow pine crossarms that was made on March 1, as announced in the March 12 number of the ELECTRIC RAILWAY JOURNAL, prices have again been reduced. The decrease, which is effective April 11, amounts to about 10 per cent and applies to the representative prices that were quoted in the March 12 issue. This is the third general price reduction inside of two months and a half, the first, on Feb. 1, amounting to 15 per cent.

It is hoped that this latest price decrease will serve as a stimulus to demand, especially as it comes at a time when kindred lines, such as poles and line hardware, are also reduced. Up to the present time the market has remained very quiet, and although stocks are good and deliveries prompt consumers have not followed up their inquiries by ordering but have preferred to hold off buying, presumably, until they think prices have reached a level low enough to represent a good buy.

Sweeping Price Reduction on Western Cedar Poles

Freight Rate Also Declines Slightly—Demand Seems on the Increase, with Good Stocks and Prompt Shipments

In order to do their share in bringing general prices to a level which will command public confidence and stimulate new activity in the industry, producers of Western red-cedar poles have announced decided price reductions. The extent of the cut, which was effective April 6, ranges in general from about 15 to 22 per cent. The new prices as compared with the old quotations on representative sizes are as follows: F.o.b. Chicago, 30-ft., 7-in. top, $8.50, $10.90; 35-ft., 8-in. top, $14.30, $16.25; 40-ft., 8-in. top, $16.80, $19.80. The same poles f.o.b. New York show the following new prices compared with the old: 30-ft., 7-in. top, $9.55, $12.20; 35-ft., 8-in. top, $16.10, $18.30; 40-ft., 8-in. top, $19.15, $22.40.

ALTHOUGH PRICES ARE REDUCED, COSTS ARE STILL HIGH

In addition to this decrease there is a further reduction of 6 cents per hundredweight based on the weight of poles at time of shipment, allowable as the result of lower freight rates which went into effect on Western red cedar poles April 1. On a 35-ft., 7-in. top pole this is said to amount to about 30 to 35 cents. The action of producers in dropping their prices, it is stated, is not entirely justified by lower costs, but in view of the tendency of consumers to hold off buying it is taken in the hope that business will be stimulated thereby. Northern white-cedar poles as yet remain unchanged in price but the Southern white-cedar product was reduced about 15 per cent more than a month ago.

Demand at present is not large but seems to be on the increase, central-station companies especially showing considerable interest in the market. Electric railways are not placing many orders but producers are quite generally optimistic that before the year is out sales will have mounted to good proportions. Stocks of poles in the West are quite large, and as a result immediate shipments can be made to Eastern points. Sales west of the Mississippi are said to be in greater volume than nearer the Atlantic coast, for in the latter territory demand has in large part been supplied by local chestnut poles, which are somewhat cheaper in first cost.

Germans Again Undersell Electric Export Market

Word comes from the ELECTRIC RAILWAY JOURNAL'S correspondent in Sweden that all German business seems to be in one great muddle with no one very much concerned. Even so and with the high export fees, Germany continues to outsell everybody, thanks to the rate of exchange. The Swiss railroads, for instance, are offered Brown-Boveri electric locomotives for 1,000,000 francs apiece, while the A. E. G. offers the same thing, f.o.b. Switzerland, for 600,000 francs.

In one thing only does this correspondent find that the Germans are high and that is insulators. One very large order for the Swedish Board of Waterfalls went to an American company at a price laid down in Sweden that was lower than the Germans could meet.

Canadian Equipment Manufacturers Undersell This Country

As an instance of the difficulties which beset American manufacturers of electric railway equipment who would sell their product outside this country, the experience of a large Canadian electric railway in buying some new cars is significant. This company required twenty new street cars and called for bids in the United States and Canada. The most inviting bid was received from a well-known car manufacturer in this country and on the face of things this concern should have received the order. But when the traction company came to figure approximately 15 per cent increase in cost on the difference in exchange rates, not to mention the customs duty and the expense of a long freight haul, it found it necessary to revise its plans. Accordingly the number of cars ordered was reduced from twenty to ten, and these were equally divided between two Canadian manufacturers. The inference here is that the Canadian bids were so high that the size of the order had to be cut in half, yet the bids as accepted still represented a lower price than car manufacturers in this country could meet under the burden of exchange rates, duty cost and freight charges. According to the same source of information Canadian electric railways, which in the past have purchased much material in the United States, have now been obliged to break away almost entirely from this custom, due principally to prevailing exchange rates. The Canadian dollar is now 88½ cents.

Rolling Stock

Indianapolis (Ind.) Street Railway Company has recently had a number of open cars rebuilt by the Barney & Smith Car Company, Dayton, Ohio. The cars, which were originally built by J. G. Brill Company and which have been in use for twenty years, were inclosed and refitted for prepayment fare operation.

Franchises

Glendale & Montrose Railway, Glendale, Cal.—The Board of Trustees of the City of Glendale has given notice of the sale of the franchise of the Glendale & Montrose Railway. The franchise calls for the operation and maintaining of a street railway along certain streets of the City of Glendale for a period terminating Nov. 4, 1963.

Track and Roadway

Tidewater Southern Railway, Modesto, Cal.—Work has been started at Modesto, Cal., grading for the new route of the Tidewater Southern Railway into this city. The new road will come along the west bank of lateral four as far as Nellie Street and there cross the canal and come along Nellie, thence over P Street to Ninth and join the present tracks at the corner of Ninth and N Streets.

Columbus Railway, Power & Light Company, Columbus, Ohio. — Much of the program calling for the expenditure of $3,000,000 facing the company is extension of present lines. One project contemplates extension of service 1¼ miles north of Columbus, a short distance beyond Clintonville. The company is now negotiating with the Columbus, Delaware & Marion Railway for the use of that company's tracks north of the city. Another extension is that to the suburb of Shepard, contemplating a mile of new track, while the company is also asked to extend its service on the Leonard Avenue line to Fifth Avenue, a distance of about a mile. These, in addition to much repaving work, delayed by the city because of the company's inability to do its share of the improvement, constitute the major part of the program.

San Francisco - Oakland Terminal Railways, Oakland, Cal. — The San Francisco-Oakland Terminal Railways has asked permission of the City Council of Oakland to double-track its line on Lake Shore Avenue between Prince Street and Walla Vista Avenue.

Montgomery Transit Company, Norristown, Pa.—The Montgomery Transit Company will reconstruct about 6 miles of track.

Charleston (W. Va.) Interurban Company.—The Charleston Interurban Company has been awarded a franchise by the City Council for the construction of a loop through Ruffner Avenue and the establishment of a one-man car line in this section. With the construction of the Ruffner Avenue loop one-man cars will also be placed on the Duffy Street loop.

Spokane & Eastern Railway & Power Company, Spokane, Wash.—The Spokane & Eastern Railway & Power Company and the Spokane Traction Company will spend $151,000 in improvements and replacements during 1921, according to the year's budget made by Vice-president F. E. Connors. Part of the money will be used for rehabilitation of eighteen of the traction cars to be made into one-man cars. Renewal of electric equipment will cost $20,000, maintenance of traction lines will cost $35,000, mechanical improvements $30,000, and the remainder will be spent for engineering improvements.

Seattle, Wash. — The utilities committee of the Council has voted to recommend the extension of a street railway line from the Duthie Loop on West Spokane Street north of Harbor Island, a distance of one mile, to the Todd Ship Building Company's plant at the north end of Harbor Island. The action was taken after petitions had been submitted by various firms on the island, and it was agreed that the cost of the railway, $19,000, will be advanced by the properties and firms benefited. It was agreed that eventually $9,500 of this cost will be refunded by the street railway department. During the peak hours of travel service will be taken care of by several service cars, with 45-minute trips during the rest of the day.

Windsor, Ont.—A direct car line to link up the southern sections of Windsor, Walkerville and Ford with main service is suggested.

Windsor, Ont.—Construction of street railway extension is contemplated by Hydro Electric Power Commission, Essex Division, Sandwich Street.

Montreal (Que.) Tramways. — Construction of the Mount Royal Tramway will be started this spring according to a definite announcement made by city authorities. This project has been under consideration for some time. Judge Saint Cyr, chairman of the Montreal Tramways Commission, has received a letter from E. R. Decary, chairman of the Administrative Commission, which gives definite instructions. The route will be along Shakespeare Road.

Power Houses, Shops and Buildings

Fort Wayne & Bluffton Traction Company, Fort Wayne, Ind.—Fire destroyed a substation and interlocker at the intersection of the Fort Wayne & Bluffton Traction Company's line and the Clover Leaf Railroad late April 6 with a loss of $10,000. The flames started from a short circuit in the substation.

Mesaba Railway, Virginia, Minn.—The Mesaba Railway will build one small carhouse, one substation and freight house. The railway will also purchase automatic control equipment for three substations.

Wilkes-Barre & Hazelton Railway, Hazelton, Pa. — The Wilkes-Barre & Hazelton Railway has purchased from the General Electric Company two 750-kw. 60-cycle rotaries with two three-phase transformers and a complete switchboard for automatic operation. This power equipment will not be delivered until July.

Professional Notes

G. E. Engineering Company, Inc., New York City, under date of April 1 announces the removal of its offices to 449 West Forty-second Street, a change that is made in line with the company's expansion of business.

William S. Turner & Company, Portland, Ore., announces the formation of an organization under the above name to act as manufacturers' agent for electric railway, power station, pumping and industrial plant equipment; to make reports appraisals etc.; and to design and construct public utility, municipal and manufacturing works. Mr. Turner will continue his business as consulting engineer in which he has been engaged for the past ten years. He has associated with himself among others, his son, Edmond S. Turner, a graduate of Stanford University, who will specialize in commercial engineering along electrical and mechanical lines. Among others the company is at present the representative of Heine Safety Boiler Company, De Laval Steam Turbine Company, Sanford Riley Stoker Company, C. H. Wheeler Mfg. Company and the James Leffel Company.

Trade Notes

Track Specialties Company, 29 Broadway, N. Y. City, announces the appointment of the Busch Corporation, 13 North Seventh Street, St. Louis, Mo., as its agent in that territory.

The American Engineering Company, Philadelphia, maker of the Taylor stoker, has established a Mid-Western service station at 1772 West Lafayette Boulevard, Detroit. A complete stock of parts for all sizes and types of these stokers is carried and immediate shipments will be made, it is announced.

The Canton Culvert & Silo Company, Canton, Ohio, reports two recent orders of more than usual size. A ten-carload order of "Acme" (nestable) Toncan metal culverts was shipped to a railroad in Cuba and the Pennsylvania State Highway Department, at Harrisburg, Pa., has awarded its annual contract to the company. The latter order totals approximately 52,000 lineal feet of corrugated metal culverts in various diameters, the equivalent of about thirty carloads.

Trackless Transportation Corporation announces the opening of general offices at 300 Madison Ave., N. Y. City. This newly organized firm of engineers and manufacturers of "The Imperial Omnibus" designed for twenty and thirty passengers with single-deck, and 50 passengers with double-deck, is prepared to plan, install, and supervise motorbus transportation systems and to furnish specially designed buses and equipment.

Electric Power Equipment Corporation, Philadelphia, Pa., announces the opening of a district office and warehouse at 215 Tenth Street, Huntington, West Va., under the direction of L. T. Hall, who has been superintendent of construction for the company, formerly Lewis & Roth, for several years. Formerly he was with the Brooklyn Rapid Transit Company, the Norfolk & Western Railway Company and other concerns in both operating and construction work.

New Advertising Literature

Refractories.—"Clinker Proof Furnace Walls" is the title of a folder issued by the Bernitz Furnace Appliance Company, 15 State Street, Boston.

Valves.—The Rensselaer Valve Company, Troy, N. Y., is distributing book No. 12, describing its "Rensselaer" throttle and control valves.

Trademarks.—"The Work of the Trade-Mark Bureau" is the title of a booklet distributed by Mida's Trade-Mark Bureau, Ellsworth Building, Chicago.

Shop Tools.—Buffalo (N. Y.) Forge Company is distributing a catalog on its various types of forges, drills, and machines for cutting, punching and slitting metal.

High-Tension Switches.—The Royal Electric Manufacturing Company, Chicago, is issuing bulletins Nos. 20 and 25 inclusive, describing a new line of high-tension air-break switch equipment and outdoor bus supports.

Wire.—Copper Clad Steel Company, Rankin, Pa., has issued a sheet on "Copperweld Wire," comparing it with weatherproof, strand, and bare copper wire as to weight, breaking load, resistance etc.

Blowers.—The "Coppus" turbo blowers for undergrate draft and other industrial service is described in a recent publication of the Coppus Engineering & Equipment Company, Worcester, Mass.

Heater Temperature Control.—Consolidated Car-Heating Company, Albany, N. Y., has issued a new bulletin No. 13-B, illustrating and describing its system of thermostatic control for electric heaters.

Acceptances. — "Acceptances, Trade and Bankers'" is the title of a new book just published by D. Appleton & Company, New York City, written by Park Mathewson, vice-president of the Business Bourse, New York.

Overhead Expenses. — Chamber of Commerce of the United States of America, Mills Building, Washington, D. C., has just issued a pamphlet on "Overhead Expenses: How to Distribute Them in Good and Bad Times."

Combustion.—"The Burning Question" is the title of a new book issued by the Green Engineering Company, East Chicago, Ind., dealing with the question of proper combustion. "The Green Cast Iron Hopper Book," recently issued by the company, describes the cast-iron and structural-steel hopper.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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Electric Railway Day on May 4

IT WAS a happy idea to have an "Electric Railway Day." The time is short in which to prepare for any extended celebration, but impromptu affairs are often the most successful and no elaborate program is necessary to do something. It does not take long to resurrect one of the early cars and put it in charge of an old crew for operation on May 4. From this step to advertising for some of the first passengers, getting together some facts about the kind of service furnished, length of ride and fares charged in the early days, and following some of the other suggestions made by President Gadsden, is not a difficult one. If the idea of "Electric Railway Day" works out well on the smaller scale which only is possible this year, a more elaborate plan can be arranged for next year. The advertising department of the association is co-operating to the full extent of its ability by making suggestions of what to do, and it is hoped that as many companies as possible will try out the idea.

In Union Is Strength, Especially in the Freight Business

THE handling of freight and express matter is a legitimate function of electric railways and when it is properly done it proves to be profitable. George M. Graham, vice-president Pierce-Arrow Motor Car Company, threw down the gauntlet before the electric railway industry last October when at the Atlantic City convention he said: "Except in isolated cases the suburban trolley is barred from developing any considerable volume of freight haulage." This disqualification, Mr. Graham thinks, results from the confinement of the trolley car to a fixed route. His challenge must be met, not with words but with profits. The companies which are transporting goods, as well as people, must show with the aid of accurate accounting that they are making money in this department, or that they can do so if given adequate facilities.

Interurban railways have been engaged in handling l.c.l. and carload freight traffic for many years. Their experience has not led them to consider abandoning this business. The recent motor-truck competition has stimulated their interest rather than discouraged it. The truck has one outstanding virtue, ability to pick up, transport and deliver goods in one handling. Lack of this ability is admittedly a handicap to the trolley, but this does not outweigh its many inherent and unique qualities. The possession of a well-graded steel runway, of highly efficient propulsion equipment, of durable wheel tires and motive-power equipment, of almost unlimited speed capacity, of ability to operate with small labor cost per ton-mile of freight movement, of skill in transportation management, of an effective maintenance organization, etc., is surely going to count for something.

But the electric railways must pull together to get the best results in this line. They must go after their legitimate share of the business with vim and with skill. The up-to-date spirit in this matter was voiced at the recent New York City meeting of the New York Electric Railway Association, at which encouraging facts were marshaled. One feature was a brief account of the co-operative movement in Rochester, visualized in the new freight terminal. Elsewhere in this issue is an illustrated account of the new terminal with some detail of the business which centers in it. Three strong interurbans are co-operating at Rochester. They are getting results. Their experiences will be interesting, stimulating and otherwise helpful to other roads which now handle freight or expect to do so.

The American Association Is Being Reborn

CERTAINLY railway men who read the report of the meeting of the executive committee of the American Electric Railway Association, printed on another page of this issue, will consider that the association is to be congratulated, and duly thankful, that it is under the leadership it now has. If any one had any doubts as to the correct answer to Mr. Wehle's question of a few weeks ago as to whether the industry would appreciate and follow the leadership of its president, Mr. Gadsden, such doubts must now be disappearing or dispelled.

In the unpleasant situation which recently arose at the headquarters of the association, it would have been easy to let events control, merely to pull through and continue on the old plan as efficiently as possible. But what has been done is that President Gadsden has taken control of events, has seized upon this as a psychological moment, when all eyes are focused on, and attention easy to get for, association activities, to give the association a new lease of life; perhaps it would be more nearly to the point to say to give new birth to the association that it may have added life and virility the more effectively to perform not only its past functions but new ones which far-sighted leadership can see are waiting and desirable, yes, even necessary, for it to assume.

The executive committee is behind this program to a man. The special committee which President Gadsden has appointed to make a study of the association's activities and to make recommendations it deems desirable should have the hearty co-operation and advice of the entire membership. Certainly there is assurance that under Mr. Gadsden's leadership it will be a working committee and it should bring in constructive suggestions of value to the association.

There is every indication that the association will thus capitalize its present misfortune and emerge a stronger, more useful force both in the industry and in national affairs.

"Value of Service" as a Valuation Criterion

THE basis of the valuation of the Public Service Railway of New Jersey, as outlined in the letter of transmittal of the engineers, Ford, Bacon & Davis, is one which must appeal to engineers, economists and men in public affairs as being eminently sound and just. This letter was quoted at length in last week's issue of the ELECTRIC RAILWAY JOURNAL. The details of how the various elements or indices of value were arrived at are presented this week. The article shows the figures upon which the engineers have based their judgment; the letter last week gives the theory which has guided the engineers in reaching their conclusion, in balancing the various indications of value in their own mind, in order to arrive at a figure which can be said to represent the value of the railway upon which rates, or condemnation proceedings or purchase might be based.

For, be it understood, two of the most important figures in this work—the operating efficiency and the final value determined—are admittedly, and necessarily, matters of judgment. It will be recalled that the New Jersey law, under which this valuation was made, provided that the valuation declared by the engineers employed by the Special Valuation Commission should be the value of the property in so far as value was an element in fixing rates. The engineers, by law, therefore had the status of a judicial or quasi-judicial body. It was remarked in these columns at the time the work was started that the engineers in charge had an opportunity, and a duty, to advance the science or art of valuation to show what the engineer, with full authority, could do in this most debatable field of engineering, law and economics.

True, some three or four days before the report was filed, the New Jersey Legislature passed an amendment to the law making this valuation subject to review on certiorari and providing that the engineers could be cross-examined on the method and figures by the use of which their final valuation was determined, and further, that the Public Service Commission could offer other evidence as to value; but it was still provided that this valuation be "presumptive evidence" as to the value of the property. However, this valuation was made under the provision of the original law, and it is now pertinent to examine the result to see what has been done by the engineers. It is necessary to consider their summary or basis of valuation separately from that part of the report which shows how the various figures were obtained, as will appear later on.

"Value of service" as the ultimate test to apply in the economics of a regulated public utility is so sound as to require no supporting argument. It is the one criterion applied by extremists of all sorts as well as by more moderate unbiased students. The trouble all comes in deciding what the "value of service" really is. The present instance is a good example of consistent and constant subjecting of each item to the test of whether it contributes to the value of service as interpreted by the engineers who have assumed, rightly, the position of deliberator as well as performing the duties which are more frequently the only ones demanded of engineers. This does not mean that one may not differ with the conclusions reached, however.

Value of service is defined by the engineers as follows:

> The sum of operating expenses, including depreciation and, when necessary, allowances for obsolescence; taxes which are fixed by law, and interest as determined above (defined as being rent of the property whose cost of reproduction has been determined), constitutes the cost of service, and when there is added to this cost profit in an amount sufficient to induce capital to flow into the industry, we have an accurate estimate of the value of the service.

The interest or "rent" becomes at once the debatable item. The object, the engineers say, is to prove the property to have a real value based on the anticipated profits from its use. These profits, in an amount equal to those obtainable in an unregulated industry, safety of investment being equal, must be allowed by any rate-making body or otherwise property would be taken without due compensation.

There can be no question, in view of all past practice and court and commission decisions, of the various items which have been set up to weigh, or consider, in arriving at the final figures. Costs of physical property, and the usual overheads, were determined in the usual way, using inventories made on previous appraisals. Intangibles, as usual, are the items which will cause debate. Of these, the ones which present interesting features are "going value" and "consolidation value." "Power lease," while given a definite value, is discussed with these. They are said to "be represented by the company's income, the market for the securities, etc." It is more than probable that the engineers under the new law will be called upon to substantiate the figures under these three heads.

Going value is a figure increasingly admitted where the development of the business has resulted in early losses or lack of return in early years uncompensated in later years. That the history of most public utilities shows such an item is well known. In this case, the engineers could find no documentary evidence either positive or negative. But they are apparently on firm ground in making a reasonable allowance for this.

Consolidation value is, it is believed, open to more careful examination. If this valuation is carried to higher courts, and this question can be singled out, a decision upon the inclusion of such an item as an independent element of value will be most important to the electric railway industry. Consolidation value is defined in the report as

> that element of value which attaches to a strong unified system as contrasted with the uneconomical condition under which smaller companies, often with diverse interests, operate in the same or adjacent territory.

This element of value is arrived at by capitalizing the estimated savings of the consolidated system as compared with a number of independent companies. Another indication of this figure is obtained by considering the price paid for the component parts of the present property, their physical values and their earning power. There is no doubt that expenditures which have been perfectly legitimate and necessary in the public interest were made to effect consolidations in electric railway systems. It is a question, however, whether it would not be more sound to amortize such expenditures rather than to capitalize them permanently.

This view is strengthened by comparing this treatment of this question with the statement of the engineers that, in their desire to base this value of service on the cost to produce a theoretical modern plant, they use the existing plant of the company, for they say:

> We are of the opinion that it would be impossible to produce a theoretical modern plant at materially less cost than the cost of producing the existing plant of the Public Service Railway.

The power lease, to which the engineers have given a present value of $19,149,000 and a pre-war value of

$11,194,000, is listed among the items which they have considered and weighed in their determination of the final figure of $125,000,000 Its value was determined by capitalizing the savings which were effected by purchasing power from the sister company, the Public Service Electric Company, rather than making it in the plant which was leased to the electric company; to this was added the value of the power facilities turned over. The lease is of value to the railway and its patrons. The arrangement is also said to be of value to the electric company, which practically owns the plant under the New Jersey law. The question naturally arises as to what extent it may be capitalized in both places.

This valuation has been discussed at this length with a view to encouraging further discussion by valuation engineers on some of the points involved. While the ability of the New Jersey Legislature to say that any sum set up by any body created by it is the value of a public utility was questioned when the law was passed, the ideas which the engineers advance in their valuation must have an effect upon a court—such as the Supreme Court of the United States—which may have occasion to pass upon the valuation. It is certain that unusual interest attaches to this valuation and, though some particular items will probably be subject to attack before the new Public Service Commission, or in court, the engineers are to be congratulated upon the constructive work they have done in valuation practice.

Valuation by Legislation and Based on Earning Power

NEW YORK has added an element to the valuation situation which raises two interesting questions. One of these, like that in New Jersey, is to what extent a legislature may lay down any rules or regulations for making valuations. The other is the introduction of "prospective earning capacity" based on a contract rate as a consideration in determining value.

As to the first point, it seems very doubtful that any legislature can lay down any rules for valuation which will have any delimiting effect in case the question of confiscation is raised before the federal courts. If a correct interpretation has been placed on the Supreme Court's decision in the Ben Avon Borough water case (see ELECTRIC RAILWAY JOURNAL, Sept. 25, 1920, page 581) no intricacies of state law or procedure can militate against a utility's having federal court protection against confiscation. Thus the clause in the New York law "but such valuation shall not in any case exceed the fair reconstruction cost of the property less depreciation" is probably without weight and effect.

As to the second point, however, the New York Legislature, by formal enactment, has given recognition, and therefore weight, to the consideration of earning power as an element of value. While the Supreme Court of the United States apparently will not allow any other judicial body or any legislature to exclude any factor from consideration in determining value, it does practically invite suggestions as to other indications of value when it says, in the now famous case of Smyth vs. Ames, "we do not say that there may not be other matters to be regarded in estimating the value of the property."

There is, therefore, nothing out of the way in the New York Legislature's requiring the transit commission to consider the "estimated prospective earning capacity" as an element of value. It may well add to the clarification and crystallization of valuation theory and practice. The exact meaning or interpretation to be put upon the phrase may not be so easily determined until put into practice. Governor Miller has, however, as indicated on another page of this issue, explained his philosophy upon which the statement is based.

Prospective earnings are certainly the principal basis upon which a free purchase of any business is made. That they should have some relation to the value of a property seems self-evident. And it is not so perfectly clear that such a line of argument is proceeding in a circle, either, for, when prospective earnings are estimated, it is on the basis of a rate of fare or value of business which is taken as being fixed—in this case a contracted fare. It cannot be the sole basis of a valuation, but it seems not unsound to consider it as an element or indication.

The City Fare Should Be More on the Interurban Car

PRACTICE universally favors the exclusion of local passengers from interurban cars in terminal cities. On out-bound trips this enables the long-distance passenger to become comfortably seated at the commencement of his journey and also eliminates unnecessary local stops to discharge passengers. In consequence, in-bound cars stop to discharge passengers only.

This is all right so far as it goes, but in Cleveland a further step has been taken. This is to make the fare on the interurban car definitely higher for the city run than on the local car. Such a fare is justified as regards the interurban passenger. The speed is higher, the car is more comfortable and the passenger rides the entire distance to, or from, the city zone limits and is therefore always a long-distance rider. Moreover, such a higher fare will tend to keep the local passenger off. The Cleveland plan looks logical.

Utilities Prove a Millstone to Kansas Industrial Court

THE Kansas Court of Industrial Relations, created as a result of the Kansas coal mine strike in the winter of 1919-1920, was intended primarily to deal with industrial disputes and to make a study of industrial conditions in the state. But in the interest of economy, and since it was a regulatory body as well as a court, it was given, as an "incidental" duty, the functions of the Public Utilities Commission which was abolished. Now, as related in the news columns this week, the Public Utilities Commission is re-created, and the reasons therefore are worthy of comment.

It seems that of almost 700 cases to come before the court all but thirty-five were in the "incidental" line of public utilities. Thus, said Governor Allen, the principal purpose of the court is smothered; the industrial court, which was created to build up the industry of the state and to bring about better industrial relations, is in bad odor with the public because it has had to do the unpopular thing and raise utility rates. Apparently the regulation of public utilities was found by the members of the court, who have performed their duties in a most commendable and high-purposed manner, to be more than incidental.

When the proposal was first made to separate these two functions and create a public utilities commission again, there was a justifiable disappointment that this Kansas experiment of having one body with jurisdiction over both capital and labor might not continue for a longer time. Public utilities have suffered—capital, labor and the public, too—from regulative measures which have had relation to only one of the two factors—rates and wages. Governor Allen points out, however, that only three of the public utilities cases have involved questions of both wages and rates. But, to provide for such contingency, the Legislature empowers the court and commission to sit as one body and decide both wage and rate cases as one. Thus is the principle retained and utilities given the opportunity to have both sides heard at once. Further, with the re-creation of the commission the importance of an able supervision and regulation of public utilities is emphasized.

The London Motor Bus Myth Again

IN PAST ISSUES there has been pointed out the downright mendacity of wildcat motor-bus promoters in attempting to make out a case for their stock-selling schemes by alleged performances of the motor bus in London. So long as such statements are confined to the prospectuses of these modern Wallingfords they deceive only a small number of unthinking investors. It is a different matter, however, when so reputable a paper as the *Boston News Bureau* is deceived into giving space to misleading data, for it is, and has been, copied far and wide by newspapers which cannot be expected to check up the veracity of the items clipped from reputable exchanges.

The item in question was contributed from London by Herbert N. Casson, once a newspaper man and writer on a variety of topics in America but more lately an efficiency magazine publisher among the British. Mr. Casson says in an outburst that recalls his American period: "Last year's figures are a surprise to every one. It appears that the buses are now carrying twice as many passengers as the tubes and four times as many as the street cars."

Well, this is not only a surprise, but a grievous and dismayful shock, for in American ignorance reliance had been placed upon no other authority than that of the Advisory Committee on London Traffic, which reported to the Minister of Transport as follows:

DIVISION OF TRAFFIC AMONG THE VARIOUS TRANSPORT MEANS IN LONDON METROPOLITAN AREA IN YEAR 1919

Suburban traffic on main lines	468,000,000
Local railways	253,000,000
District Railway	140,000,000
Tube railways	266,000,000
Total of non-surface transit	1,127,000,000
Motor-buses	861,000,000
Tramways	1,053,000,000
Total traffic all means of transit	3,041,000,000

Complete figures for 1920 are not yet available. But figures so far received indicate that there is no great variation, for 1920, from the general proportions indicated in this 1919 report.

To contradict so exuberant a transportation authority as Mr. Casson is distasteful, but it is submitted that, except in the company of the Mad Hatter and the March Hare of "Alice in Wonderland," the tramway figure of 1,053,000,000 is larger than the bus figure of 861,000,000 and by all odds is not one-fourth of the bus figures. Now, as a matter of fact, Mr. Casson seems to have come to his conclusion by paying no attention to any transport undertaking outside the pale of what is popularly known as the "London Traffic Combine," namely, the group of underground, bus and tramway lines under the direction of Lord Ashfield, as distinguished from the municipal tramway systems. In fact, a check of the figures in Mr. Casson's original article against those of the Ashfield group alone for 1920 shows that they are identical. Without going into more detail figures, it is true that within the combine itself the motor bus is the greatest carrier, then the underground lines and finally the tramways.

Those who are really familiar with London transport matters know that the tramways of the combine, namely, the Metropolitan Electric, the London & Suburban, the London United, etc., never have been big factors in its operations, inasmuch as these are suburban systems in rather poor territory. On the other hand, they also know that the bus has always had the monopoly of surface transit in the richest areas of London for purely physical conditions that call for no elaboration here. That these tramways, plus the great system of the London County Council and smaller municipal tramways, should be carrying over a billion riders a year is more remarkable than the record of the buses. As Mr. Casson goes out of his way to cast slurs upon the municipal tramways, he must have been aware of their existence; yet he ignores them in his remarkable comparison.

The management of the London General Omnibus Company could not for a moment be assumed to countenance such incomplete statistics as these. As operators, also, of both underground railways and surface tramways, they may be presumed to know something about the relative virtues of each. It is not on record that they are eliminating the subways and tramways that they have, although they are sometimes obliged to parallel their own services part of the way with buses because the latter have the good fortune of starting from the traffic centers, and of course they could not very well stop short on coming to a tramway route. The recent introduction of forty-six-seat and fifty-four-seat buses is in itself a compliment to the seventy-eight-seat tramcar of London (not to mention the London County Council train operation) for they know that the dominant cost item in transportation is platform labor.

In any case, the purpose of this is not to take up the cudgels for the tramcar as against the bus. There is nothing in an antagonism which, in this country, is carried on more to bait the street railways than for any sound technical reason. If the experience of Great Britain means anything to this country there is going to be a great deal of bus operation where the traffic is too thin or too fluctuating to justify a trackway; and such bus operation will naturally be a part of the local street railway system. In London, the motor-bus is doing a wonderful piece of work in mass transportation, and, to a certain extent, also in Paris. But elsewhere in Europe, the bus is an auxiliary and not the whole show nor even a big factor in the total number of passengers carried. As an example, one may quote Liverpool, which is operating scores of buses for certain tie-up and through routes; but which is also planning high-speed right-of-way tramway lines as the most economical method of carrying trunk-line traffic.

In conclusion, it would be utter waste of time to judge the various forms of transit on the basis of financial results during the last hectic years. Street railways, motor buses, subway lines, elevated lines, suburban lines, interurban lines, trunk railways—each and every one of them can show failures galore, but it is not safe to draw any deductions therefrom without a prayerful study of all the factors in the case. Hadn't newspaper writers better leave this subject to those who are earnestly striving to carry the public in the most comfortable and economical manner regardless of whether gas or electric propulsion is used? Why rock the boat in such stormy days as these?

The Cleveland Wage Agreement Points the Way

COMMON SENSE has prevailed among the trainmen of the Cleveland Railway Company and the way has been paved for a wage scale in keeping with the downward trend of living costs. By almost unanimous vote of the unionized conductors and motormen, the company's proposition of a 20 per cent reduction in wages has been approved and working conditions will be adjusted to a more normal basis. The 20 per cent reduction means that the base rate per hour after May 1 will be 55 cents for the first three months' service, 58 cents for the balance of the first year and 60 cents per hour thereafter. This gives hope of building up the interest fund to a point where it will not be necessary to consider another advance in the rate of fare. In addition, changes made in working conditions eliminate extra pay on swing runs due to their spread and reduce the pay for extra work performed on week days from time and one-half to time and one-quarter. No change is made in conditions governing Sunday and holiday work in such cases.

Much credit is due President John J. Stanley for the manner in which he handled this situation. By taking a positive stand months before his contract with the trainmen had expired, he won the support of the people who were interested in having their fares kept as low as possible. He was ready to arbitrate the question in accordance with the terms of the agreement. The employees, sensing the public frame of mind, were not even willing to take chances with a board of arbitrators which might hold them to conditions less to their liking than those offered by the management. They also took a wage scale two cents lower than that which they might have had with an "open shop."

Cleveland has had one of the highest wage scales in the country. Its agreement is expiring earlier than that of many of the larger properties, and the effect of a voluntary acceptance of a 20 per cent reduction in wages by the men should be felt elsewhere. The modified working conditions will also have an appreciable bearing on cost of operation, and the public will get the benefit of service which can be given without the present penalties. Evidence given before the War Labor Board by several companies showed that street railway work cannot be confined to the number of hours which govern in other industries. The nature of the business, the riding habits of the people make this impossible. It should have been apparent, therefore, that it was unfair to penalize the companies for spreading their work beyond a fixed maximum.

Some companies have working conditions even more costly for the management than those prevailing in Cleveland. These should be changed, and the outcome of the Cleveland dispute will doubtless help to bring about the change. The employees had their way when the labor market was "short." Spread of unemployment and ability to get men to work on company terms have turned the scale. A period of deflation is at hand, and the wise employee will accept the offer of the prudent manager in a wage scale which need not be stingy and should not be extravagant. The coming summer should witness a general turn "back to normalcy."

Texas Five-Cent Fare Decision Should Not Be Misinterpreted

THERE are so many statements and comments still being made about the decision of the Supreme Court in the 5-cent fare case of the Public Service Company in San Antonio, Tex., that it is worth while to call attention, again, to the salient facts in the case. The full text of the decision, not available last week, is now at hand and it is apparent that while the decision, being from the Supreme Court, is of nation-wide significance, its direct application depends upon state constitution or law.

What the Supreme Court has said is that San Antonio did not have the power to execute the contract which it tried to execute, or thought it did execute, with the railway company. The company is not, therefore, bound by the terms of the agreement. In the absence of a contract, the city cannot enforce a rate which is confiscatory, as that is against the Federal Constitution. This decision, therefore, while of great significance to the industry is limited in its application to the condition where the city does not have the power to make a binding contract.

The situation where both parties have the power to make a contract was not considered in the San Antonio case but was treated in a decision which the Supreme Court rendered on the same day in the case of three Iowa electric lighting companies. There the court said, in quoting previous opinions in several cases, including electric railway cases in Detroit, Cleveland and Columbus, that where public service corporations and government agencies have power to contract as to rates and exert that power by fixing by contract rates to govern during a particular time, the enforcement of such rates is controlled by the obligation resulting from the contract and therefore the question of whether such rates are confiscatory becomes immaterial.

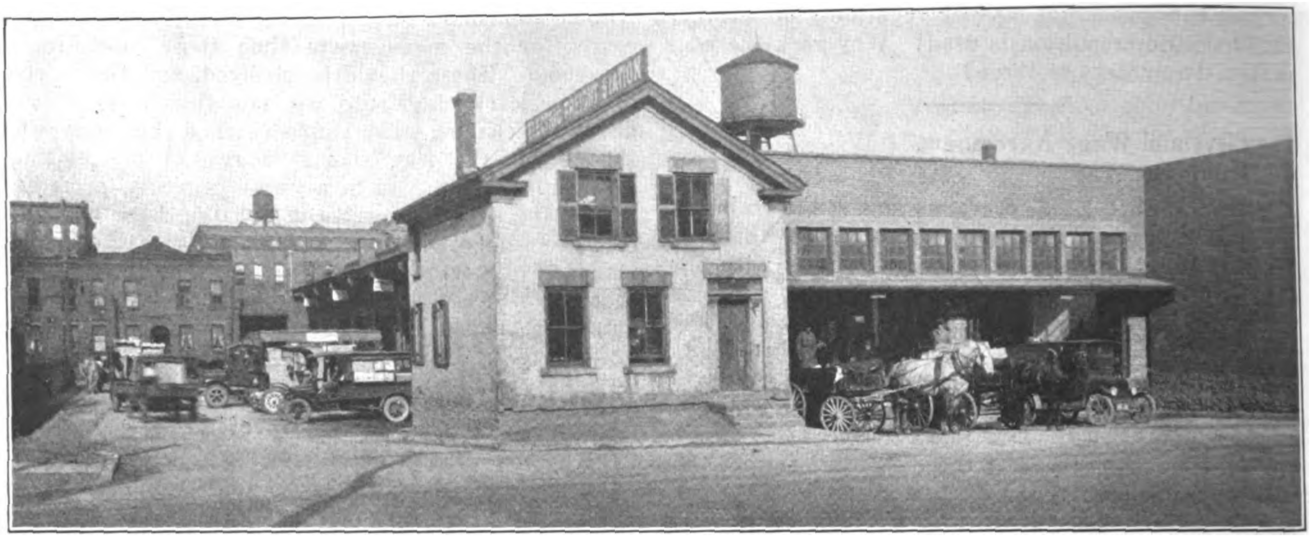
The San Antonio case, then, does not abrogate all franchise rates in the United States; it does not restore valuable property which a man has foolishly sold for less than its worth; but it does give one more assurance that confiscation will not be allowed.

Quotation from the Federal Electric Railways Commission Report

No. 17

THE full co-operation of labor in the street railway industry will not have been brought about alone by the recognition of the right of collective bargaining which we have just been urging. Such recognition is but a foundation for full co-operation. The actual work of insuring it must come from the employees themselves, to whom the right of collective bargaining is thus given. For that right carries with it a duty. It would seem to be the duty of the organization which bargains for the individual worker to interest itself actively and unremittingly in his delivering to the company his best strength and intelligence.

This commission thinks that where the street railway worker has the right of collective bargaining the public has the right to expect that the organization or association representing him will not only procure his wage but will also continuously stimulate his wholehearted constructive co-operation with the company and his effective service to the public.



THE CENTER OF THE ELECTRIC FREIGHT BUSINESS IN ROCHESTER, N. Y.

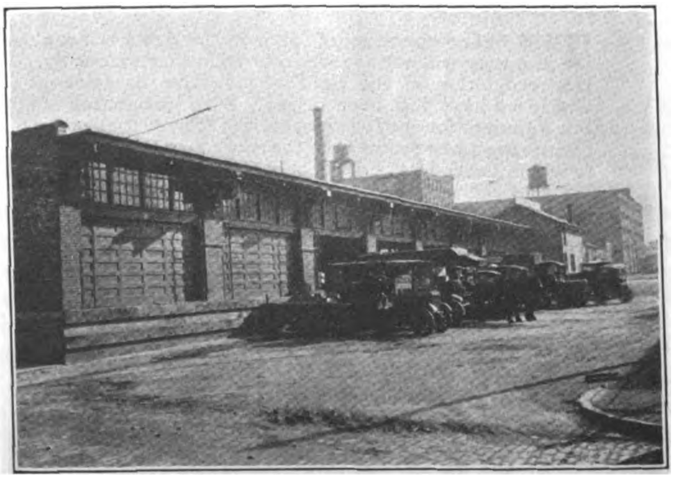
Freight Co-operation at Rochester

Three Interurbans Are Operating a Union Freight Terminal that Was Designed to Be Simple, Inexpensive and Convenient—It Is Managed by a Board of Three Trustees Who Take the Chairmanship in Turn

By L. R. BROWN
Office and Field Engineer New York State Railways, Rochester, N. Y.

THE New York State Railways, in conjunction with the Rochester & Syracuse Railroad and the Rochester, Lockport & Buffalo Railroad, have just completed and put into operation a union interurban freight terminal. The New York State Railways previously operated electric freight service on its interurban lines between Rochester and Sodus Point and between Rochester, Canandaigua and Geneva, N. Y. The Rochester terminal was located on Otsego Street. It was small and not easy of access and business became very congested at times. The Rochester, Lockport & Buffalo Railroad operates between the cities from which it takes its name and serves also several small cities and villages located on its line. This company had previously conducted electric freight service in conjunction with the Rochester & Syracuse Railroad, with a station located near the Erie Railroad freight station on Exchange Street, Rochester. This station was about 1 mile from the station of the New York State Railways. The Rochester & Syracuse Railroad operates between Rochester and Syracuse and many small cities and villages on its lines.

These three electric railway companies entered into a ten-year agreement whereby the first cost of the terminal was borne proportionately by each, and the yearly operating cost is assigned on the basis of the tonnage handled by each during the year. Each company appoints a trustee to care for its interests in the terminal. The trustees meet once a month. One member is elected as manager for a year and thus each company has the managership every third year. B. E. Wilson, general passenger and express agent New York State Railways, is the present manager.

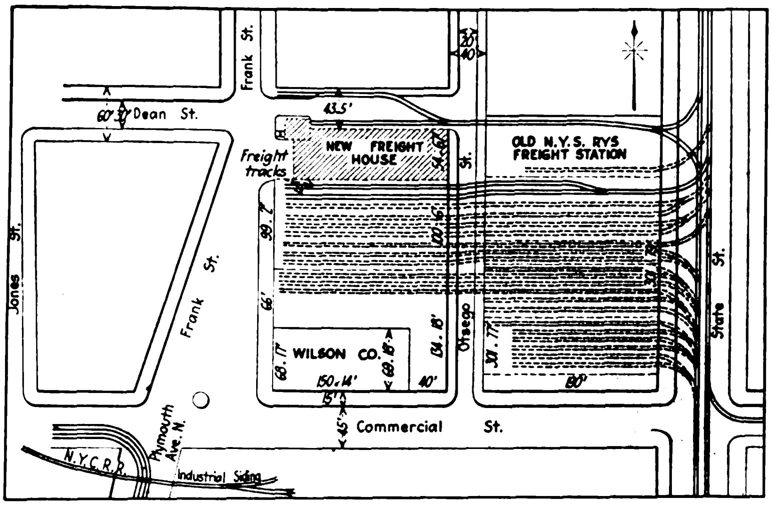


RECEIVING SIDE OF THE NEW TERMINAL

The new union electric freight station is located between Frank and Otsego Streets in Rochester. It is in the rear of the New York State Railways' State Street carhouse and offices and only one block from the Kent Street freight station of the New York Central Railroad. The electric freight cars have access to both sides of the terminal by means of spur tracks leading from the tracks of the New York State Railways in State Street. Teams and trucks have access to one side and one end of the freight station, with entrance on both Frank and Otsego Streets. The new building, as shown on the accompanying plan, adjoins a carhouse of the New York State Railways and the wall of this was used as a wall of the new building. Five openings were cut through this wall at convenient locations to fit the doors of the various cars and two of the carhouse tracks next to the new freight house were taken over as freight tracks. The second track can only be used "loading through" cars standing on the first track. The location of these loading doors is shown in the construction photograph. As the cars used by the three companies are of various lengths and heights, some having center doors and others having two side doors near the ends, the openings in the walls were located by the aid of car templates so that any of these cars could load or unload next to the freight house at the same time. Pits on one of the tracks provide opportunity for inspection of the cars while in the station.

DURABILITY A FEATURE IN THE DESIGN

The building itself is 170 ft. long and 54 ft. wide. The outside walls are of brick. The building is one story high and has a Barrett specification tar gravel roof laid on 1¾-in. matched roof boards. The timber roof is supported by wood posts which form nine bays, the distance between posts being 18 ft. The bottoms of the posts rest on concrete piers containing cast-in dowel pins. The piers extend down to the original soil. The bottoms of the wood posts supporting the roof are protected from trucking by angle irons secured to each of the four corners. All exposed corners of brick work are protected in the same manner.



FREIGHT TERMINAL IS LOCATED CONTIGUOUS TO NEW YORK STATE RAILWAYS CARHOUSES

The floor of the freight house is of concrete, 6 in. thick, the surface being protected from trucking by the use of Ironite, a mechanical hardener. The entire floor was laid on a freshly made fill about 3½ ft. deep. This was done to bring the floor up to the level of cars and trucks. The fill was compacted by the puddle method. Each load of earth was spread and thoroughly soaked with water from a fire hose. The fill was made slowly while the rest of the work was going on, and the teams driving over the surface helped compact the fill. The concrete floor was the last part of the construction to be done. It was built in alternate blocks after the outside doors were hung. No expansion joints were used.

A two-story brick residence, left standing on the property, was incorporated into the freight terminal for use as an office and warmroom. This was one of nine residences which stood on the property. The others were removed to provide space for the freight terminal. The basement of the residence provides room for the heating plant and quarters for the freight handlers. The ground floor is occupied by the cashier's office and the warmroom, as well as a washroom and toilets for the men. The second floor has rooms for the billing clerks and bookkeepers and a restroom for the women clerks. A dummy waiter between the cashier's office and the billing clerk upstairs saves many steps.

The main freight room is divided into two parts by a strong slat fence. This separates the inbound from the outbound freight. Each village or city which has considerable freight traffic is allotted a portion of the floor which is properly designated by signs. Portable desks are provided near the doors so that clerks can check off goods received in or sent out of the terminal. Two sets of automatic scales are provided of five tons capacity each. These are both located in the outbound end of the terminal. The foundations of these scales can be seen in the construction photograph.

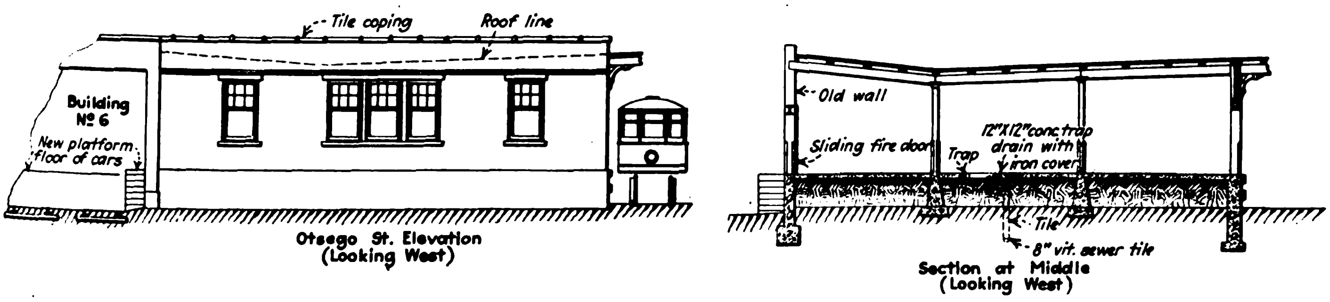
Light is admitted to the building by windows in the east end and by windows over the doors extending the full length of the north and west sides. Skylights, the use of which was contemplated in the original design, were omitted on account of expense. The building as designed was intended to be the cheapest possible, taking into consideration the appearance and use.

SOME OTHER STRUCTURAL FEATURES

For fire protection a sprinkler system has been installed to protect the freight-house offices and cars from fire. The openings between the buildings are protected by tin-clad sliding fire doors. The outside doors, which occupy the full length of the north and west sides, are of the sliding folding type, being made of parallel cypress. The stiles are two inches thick. Gas pipe guards have been erected to protect the doors from trucking when they are folded back into the open position. The doors are very easily and quickly operated.

The new union freight station is located just across Otsego Street from the old New York State Railways freight station. Electric freight cars pass through the old station to reach the new terminal, thus making it very convenient to utilize the old station as an overflow for the new station should occasion require. A photograph is shown of the old station and another of the new one taken from the roof of the old station.

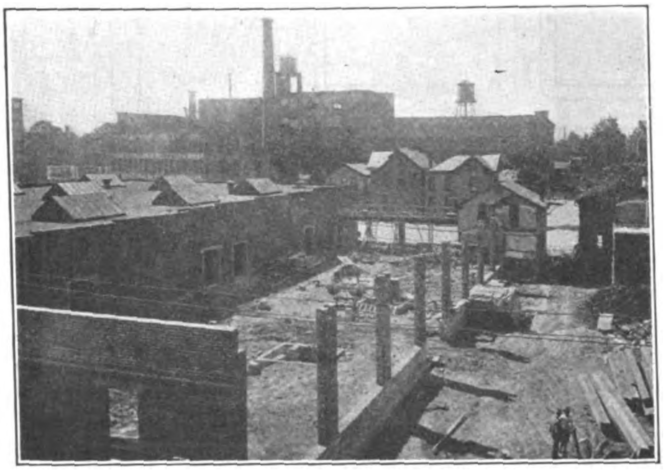
An important feature of the terminal is the large



Otsego St. Elevation (Looking West)

Section at Middle (Looking West)

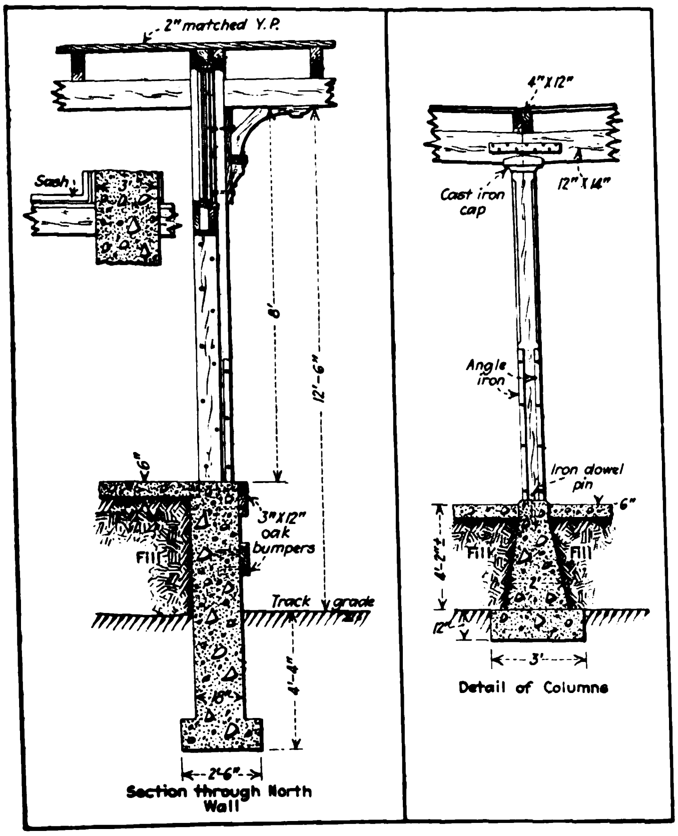
ELEVATION AND CROSS-SECTION OF TERMINAL REPRODUCED TO SUGGEST STRUCTURAL DETAIL



A CONSTRUCTION VIEW, STATE RAILWAYS CARHOUSE IN BACKGROUND

N.Y.S. ROCH
FREIGHT
STATION

OLD ELECTRIC FREIGHT STATION REPLACED BY NEW TERMINAL



Section through North Wall

Detail of Columns

SOME CONSTRUCTION DETAILS OF THE ROCHESTER ELECTRIC FREIGHT TERMINAL

paved area provided for the use of teams and trucks. The entire yard is paved with concrete, thus eliminating the muddy conditions which existed at the other terminals at certain times of the year. This paved area provides a space about 40 ft. wide in front of all the doors, as well as a passage between Otsego and Frank Streets. The west end of the station is set back 20 ft. from the street line, so that trucks backed up to the station will not block the sidewalk on Frank Street.

"USE FACTOR" OF BUILDING IS HIGH

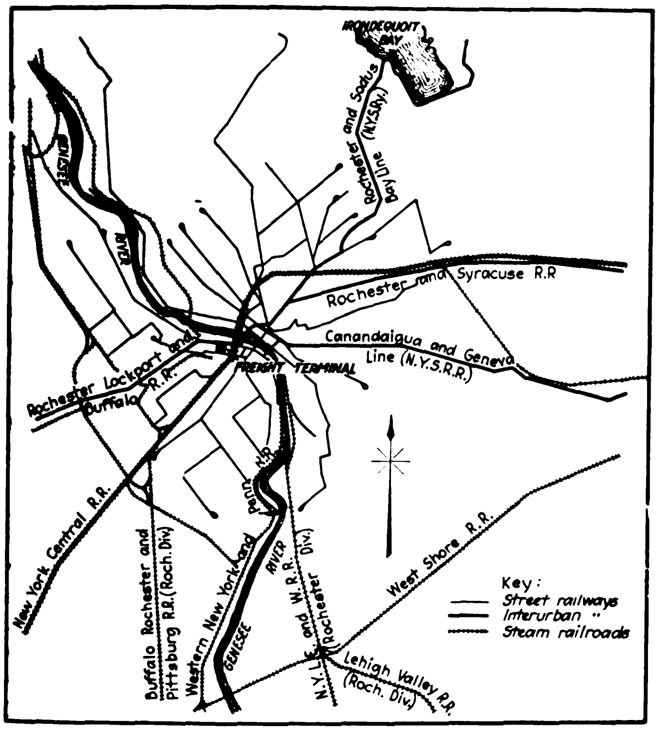
The terminal is operated on a twenty-four-hour basis, openings on the north side of building being used for teams and trucks in the daytime and for cars at night. Including the team track along the north side of the property, eleven cars can be loaded or unloaded in the terminal at the same time. This does not include the old station space between State and Otsego Streets, which will hold seven other cars. In the daytime, when there are no freight cars loading on the north side, twenty teams or trucks can back up to the doors and load or unload at the same time.

The arrangement of tracks provides for the transfer of freight with minimum amount of handling. The location of the two tracks side by side makes it possible to transfer freight direct from one car to another. The tracks on the north side of the freight house facilitate loading direct from truck to car or vice versa. The track on the extreme north side of the property provides for the "setting in" of a box car or trailer which

THIS FREIGHT HAS BEEN WEIGHED AND AWAITS SHIPMENT

TYPICAL FREIGHT SHIPMENTS READY FOR LOCAL DELIVERY may require more than one day to load or unload. The location of tracks on both sides of the building eliminates much truckway, as freight brought in on cars at night can often be left near the doors, whence it will be taken away by trucks in the morning.

This union electric freight terminal furnishes the needed link properly to provide western New York with electric freight service. Through rates are now established between all places on these lines between Syracuse and Buffalo. Trailers can be used for less-than-carload lots or transfer can be easily made, as explained, at the new terminal. It is expected that the union station will effect a reduction in the terminal costs of the companies and increase the general freight business of each of the roads concerned.


IRONDEQUOIT BAY
Rochester and Sodus (N.Y.S.Ry.) Bay Line
GENESEE
RIVER
Rochester and Syracuse R.R
Canandaigua and Geneva Line (N.Y.S.R.R.)
FREIGHT TERMINAL
Rochester Lockport and Buffalo R.R.
New York Central R.R.
Buffalo Rochester and Pittsburg R.R. (Roch. Div.)
Western New York and Penn. R.R.
RIVER
GENESEE
N.Y.L.E. and W.R.R. (Rochester Div.)
West Shore R.R.
Lehigh Valley R.R. (Roch. Div.)
Key:
Street railways
Interurban "
Steam railroads

INTERURBAN LINES WHICH CONVERGE AT NEW ROCHESTER FREIGHT TERMINAL

The plans for the terminal were prepared by the writer.

Greatest Living Engineers

AN INVESTIGATION recently conducted by the American Association of Engineers as to the relative standing of prominent engineers discloses among others the following results: Among electrical engineers C. P. Steinmetz heads the list, while Elihu Thomson, Thomas A. Edison and Alexander Graham Bell form a group following closely thereafter. B. G. Lamme, Frank J. Sprague and Bion J. Arnold are also well up on the list. First and second respectively on the civil engineers' list are General G. W. Goethals and Prof. George F. Swain, while the corresponding ratings are given to John A. Brashear* and Orville Wright for the mechanical engineers, Herbert C. Hoover and John H. Hammond for the mining engineers, and Leo H. Baekeland and W. R. Whitney for the chemical engineers.

The above ratings were made by the deans of a number of engineering and scientific schools.

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*Dr. Brashear died after the making of the canvass. Ambrose Swazey was tied with Mr. Wright for second place.

Detroit's Motor Bus System

Twenty-eight Motor Buses Being Operated on Two Routes, Having a Maximum Possible Haul of 13 Miles for a Flat 10-Cent Fare—Policy of the Company Is of a Constructive Character

DETROIT'S population of 1,000,000 was carried two and one-half times by an average of twenty-one buses during the first seven months of operation of the motor bus system established there in June, 1920. The report of the Detroit Motorbus Company for the period ended Dec. 31, 1920, shows gross earnings of $253,599 and net earnings of $20,051 after setting aside $24,310 as a reserve for depreciation of equipment and $5,688 as a reserve for injury and damage claims.

Service was started on June 11, 1920, between Grand Circus Park and the Detroit water-works, via Woodward and Jefferson Avenues, a 5-mile run, with eight buses on an eight-minute headway. At the present time twenty-eight motor buses are operating on a six-minute headway over 13 miles of street. The Jefferson Avenue route has been extended east to the Continental Motor factory (1.5 miles) and north on Cass Avenue to Amsterdam Avenue (2.5 miles). An additional service is operated via John R. Street, Piquette and Amsterdam Avenues and Second Boulevard, from the City Hall to Boston Boulevard (5 miles). This route connects with and transfers to the Cass and Jefferson Avenue route at the Amsterdam Avenue terminal.

Operation is authorized by the city of Detroit under a general motor bus ordinance approved by the City Council Dec. 26, 1917, and amended May 26, 1919, licensing the operation of motor buses on all the streets and parkways of the city except those of Belle Isle Park. The company has no franchise. The ordinance provides that any license issued thereunder shall be subject to renewal or revocation. It also provides for amendment or alteration. Under these conditions a company that was not confident of its ability to render acceptable and popular service would not be likely to undertake it.

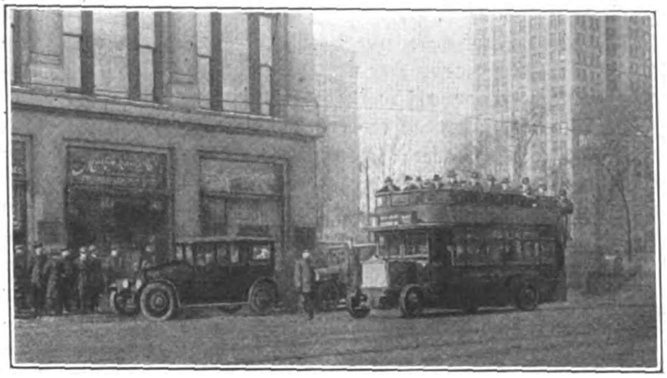
Like any other common carrier in Michigan, the bus company is subject to commission regulation.

DETROIT MOTOR-BUS COMPANY
INCOME STATEMENT—JUNE 11 TO DEC. 31, 1921

	Actual	Per Bus-Mile, Cents	Per Cent of Total	
			Revenue	Operating Expenses
Operating revenues:				
Passenger fares	$250,280	40.15	98.70	.....
Omnibus hire	455	0.07	0.17	.....
Advertising	2,864	0.46	1.13	.....
Total	$253,599	40.68	100.00	.....
Operating expenses:				
Maintenance of plant and equipment	$16,865	2.71	6.65	7.32
Reserve for depreciation	24,310	3.90	9.58	10.55
Conducting transportation	155,351	24.94	61.26	67.47
Traffic expense	2,171	0.35	0.85	0.94
General and miscellaneous	25,837	4.14	10.22	11.25
Reserve for injuries and damages	5,689	0.91	2.24	2.47
Total	$230,223	36.95	90.80	100.00
Net operating revenue	23,376	3.73	9.20	10.13
Taxes, license fees, etc. (a)	1,027	0.16	0.40	0.45
Income from operation	$22,349	3.57	8.80	9.68
Miscellaneous income	160	0.03	0.06	0.07
Gross income	$22,509	3.60	8.86	9.75
Deductions	2,458	0.39	0.97	1.07
Net income to profit and loss	$20,051	3.21	7.89	8.68
Passenger traffic:		Number		
Revenue	2,502,800	4.015	.....	.....
Transfer	236,005	0.379	.....	.....
Total rides	2,738,805	4.394	.....	.....
Bus-miles run	623,385	......	.....	.....
Per cent of buses in daily use	97	......	.....	.....

(a) Exclusive of federal income and profits taxes.

During the spring and summer of 1921 it is planned to increase and extend the service. The Jefferson Avenue line is likely to be extended to the city limits on the east and to have a downtown terminal at Grand Circus Park as originally. A Cass Avenue and Second Boulevard line will run from the Windsor Ferry at the foot of Woodward Avenue to Boston Boulevard. An additional service on this line starting from the ferry will diverge at the West Grand Boulevard and run west to Grand River Avenue. An additional service on the Jefferson Avenue line will diverge at the East Grand Boulevard and run north to the Packard factory. The John R. Street line will probably be extended straight north on John R. Street to Boston Boulevard. These extensions will be made possible through the receipt of forty additional buses of the Detroit low type, which can operate safely with passengers on the upper deck under the viaduct of the Michigan Central Railroad, which has vertical clearances over the streets it crosses of but 12.5 feet.



DETROIT LOW-TYPE BUS WITH LEFT-HAND DRIVE

DESIGN OF BUSES

The Detroit bus was developed by the New York Transportation Company (which owns the Fifth Avenue Coach Company of New York and controls the sale of the vehicles it manufactures) for service on streets where the overhead clearances precluded the use of the standard Fifth Avenue type. With the exception of the height, the bus is similar in appearance to the standard Fifth Avenue bus, but has a left-hand drive.

So successfully does the Detroit bus meet the special problems of low overhead clearances that the tallest man sitting on an upper-deck seat will have at least 6 in. clearance above the top of his hat while passing under the railroad viaducts. The same man standing on an upper deck could not possibly reach a railroad trolley wire at its standard height.

The bus occupies less than 3.75 sq.ft. of street space for each passenger carried and weighs only 223 lb. per passenger capacity. It can be turned completely around in a 60-ft. street without backing. The stepless platform is 14 in. above the pavement and 8 in. above the sidewalk. Route numbers are carried on roller curtain destination signs on the front of the bus and also at the right of the entrance. In winter the lower deck is heated by the exhaust from the engine and the heat is regulated by a hand valve.

On the lower deck ten stationary cross seats, with rattan coverings, provide places for twenty passengers facing forward. A bulkhead seat allows space for two additional passengers riding backward. A bright and cheerful interior is obtained by the use of 100 sq.ft. of glass and white enameled ceiling. The windows are of the drop sash type and practically convert the lower deck into an open car when it is desired in warm weather.

On the exposed upper deck, which has a capacity of twenty-six passengers, wooden slat seats, each seating two, arranged seven on the right side and six on the left, are used, due to the impracticability of obtaining a weatherproof, self-draining spring seat. Each seat on both decks is equipped with a push-button signal for the convenience of the passenger in signaling the driver at alighting points.

FARES AND TRAFFIC

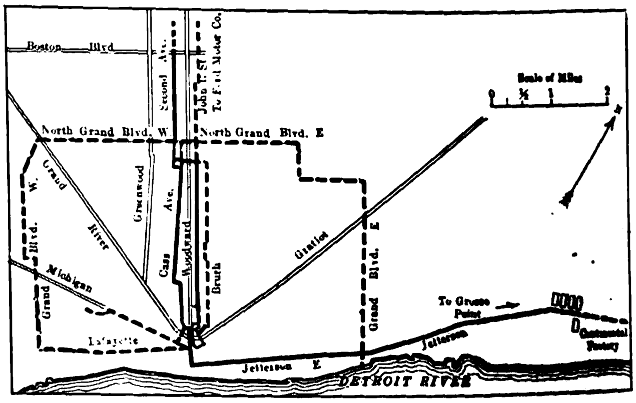
Operation is conducted under the flat fare system, with the base rate 10 cents. Free transfers are issued to connecting routes for travel in the same general direction. Every passenger is provided with a seat, and no standing in the aisles or on the platform is permitted. Smoking is allowed only on the upper deck of the bus.

Transfer regulations provide that transfers are good only to the person to whom issued, and no other, for a continuous trip on the first bus on which there is a vacant seat upon either deck under the usual conditions of time and direction.

The system of fare collection follows the "collect within" principle and utilizes the Rooke automatic register.

The traffic that has been developed by the buses is surprising. During the less than seven months of 1920 they carried 2,502,800 cash passengers and 236,005 transfer passengers or a total of 2,738,805, or at the rate of 591 cash passengers per day per bus, or 215,715 cash passengers per bus per annum. The bus mileage that was made during this period was 623,385.1. The percentage of buses owned that were in operation daily throughout the period was 97 per cent. The table gives a detailed analysis of operations and the cost of service on a bus-mile basis.

The general policy of the company has been constructive in character, aiming to supplement the street railway service rather than compete with it, and as far as possible to supply service on the thoroughfares not served by any street railway line.



BUS ROUTINGS IN DETROIT, FULL LINES SHOW PRESENT ROUTES—DOTTED LINES SHOW PROPOSED EXTENSIONS

In more than five million safety-car miles in Terre Haute, Ind., the railway company has had only six cases of motor trouble—four armatures and two fields.

Method Used in New Jersey Valuation

An Analysis Showing How the Reproduction Costs on Two Price Bases Were Determined and Used in Reaching the Value of $125,000,000 for Rate-Making Purposes—Property as a Whole Found Well Maintained — Operating Efficiency of the Physical Property and Organization Is Set at 86 per Cent

IN DETERMINING $125,000,000 to be the value of the operative physical property and business, exclusive of franchise value, for rate-making purposes of the Public Service Railway of New Jersey, Ford, Bacon & Davis, engineers employed by the New Jersey State Valuation Commission, prepared two separate reproduction-cost appraisals on different price bases. They also considered the historical cost or investment in the property since its inception. Using average pre-war prices ruling from the period between 1910 and 1915, the value determined was $88,815,887 with accrued depreciation amounting to $14,382,789, as against $189,489,560 with accrued depreciation of $32,784,505 if prices as of Sept. 1, 1920, had been used. The historical cost as found amounted to $119,150,263.

The unamortized cost of superseded property amounted to $4,701,943, while the reproduction cost of non-operative property was $502,713 at pre-war prices and $645,593 when Sept. 1, 1920, prices were used.

The outstanding securities of the railway amount to $165,066,556, divided as follows: Common stock, $83,038,000; preferred stock, $1,166,500; bonds, $79,235,016, and equipment notes, $1,627,000.

An inspection of the physical property indicated 80 per cent condition. In the judgment of the engineers the operating efficiency of the property and organization was placed at 86 per cent.

In determining the reproduction values the detailed physical inventory prepared by Dean M. E. Cooley as of Dec. 31, 1915, which had been previously checked in many details by the New Jersey Public Utilities Commission engineers, was used as a basis. Additions since that time, which were principally for rolling-stock, were taken from the company's records.

The reproduction cost new valuation made by Cooley was based upon average unit prices extending over the five-year period from 1911 to 1915 inclusive. With additions to capital from Dec. 31, 1915, to Jan. 31, 1920, the total value amounted to $88,165,858.

WHAT THE VALUATION INCLUDES

The present valuation embraces the entire electric railway system of 832.92 miles of track owned or operated under leases of 900 years or more by the Public Service Railway Company; the properties of the Riverside & Fort Lee Ferry Company; the Port Richmond & Bergen Point Ferry Company; the Peoples Elevating Company; the Jersey City Wagon Elevator; the Public Service Terminal in Newark; the property installed by the Emergency Fleet Corporation in Newark, Kearney and Camden, and the value of the tracks and overhead prior to relocation in Camden which the government has agreed to restore to its old location at the expiration of the government's use of the property. None of the property of the Public Service Railway Company is included.

TABLE I—GENERAL TRACK STATISTICS

Miles of Track Operated	Girder Rail	Low T-Rail	Total
Special work	67.84	16.48	84.32
Straight track	488.58	260.02	748.60
Total	556.42	276.50	832.92
Equivalent rail tonnage	77,452	32,987	110,439

TABLE II—ROLLING STOCK OWNED

	Closed Cars			Open Cars		
	Four Motor	Two Motor	Trailers	Four Motor	Two Motor	Total All Kinds
Double end, double truck	696	171	..	106	31	1,004
Single end, double truck	(a) 585	248	..	257	48	1,138
Double end, single truck	...	79	..	...	121	200
Safety-cars, double end, single truck	...	195	..	...	...	195
Trail cars, double truck	...	...	1	...	...	1
Electric locomotives	...	...	..	...	...	....
Service and work cars, all kinds	...	...	..	...	...	284
Total	1,281	693	1	363	200	2,822

(a) Includes fifty-one single-end, double-truck, four-motor cars paid for by U. S. Shipping Board Emergency Fleet Corporation but used in the operation of the Public Service Railway and to be purchased by the company.

TABLE III—ESTIMATED COST OF REPRODUCTION NEW—NON-OPERATIVE PROPERTY

(Account 404)

	Pre-War Prices	Sept. 1, 1920, Prices
Land	$341,875	$341,875
Buildings	100,552	227,556
Structural overhead costs	55,303	71,179
Property to revert (a)	4,983	4,983
Total	$502,713	$645,593

(a) Two buildings are on land owned by the railway company which is leased to others. The buildings will revert to the company at the end of the lease and the amount, $4,983, shown is the present worth of an amount of money which at 8 per cent compound interest will equal the estimated value of the buildings at the end of the lease.

TABLE IV—MISCELLANEOUS INFORMATION

	Unit	Quantity	
Poles:			
Wood	No	25,927	....
Iron	No	19,958	45,885
Cross-arms:			
Wood	No	25,569	....
Iron	No	3,525	29,094
Insulators	No	....	76,058
Strain insulators	No	....	53,938
Lightning arresters	No	....	2,071
Span wire	Ft.	....	1,698,721
Trolley wire	Lb.	....	1,824,141
Feeder wire	Lb.	....	9,850,345
Trolley cars	No.	....	39,923
Rail bonds	No.	....	160,570
Rails:			
Girder	Tons	77,452	....
Low T	Tons	32,987	110,439
Ties:			
Untreated	No.	1,294,204	....
Treated	No.	696,827	1,991,031
Stone ballast	Cu. yd.	....	682,369
Paving—Class A:			
Rectangular block	Sq. yd.	1,214,636	....
Belgian block	Sq. yd.	434,228	....
Brick	Sq. yd.	145,304	....
Wood block	Sq. yd.	119,058	....
Asphalt block	Sq. yd.	15,071	....
Asphalt	Sq. yd.	105,798	2,034,095
Paving—Class B:			
Macadam	Sq. yd.	1,076,751	....
Amesite	Sq. yd.	4,438	....
Tarvia	Sq. yd.	59,545	....
Telford	Sq. yd.	227,545	....
Bitulithic	Sq. yd.	2,244	....
Cobble and rubble	Sq. yd.	81,549	1,452,072
Total paving	Sq. yd.	....	3,486,167
Concrete foundations	Sq. yd.	....	246,637

The power generating system, including main stations, substations and transmission lines, together with certain real estate which were leased on July 1, 1910, to the Public Service Electric Company for 999 years, was excluded, as the property in question is not used directly by the railway in its operation. Federal courts have construed that such long term leases under New Jersey laws are for all practical purposes conveyances of the property. The actual investment in power stations, however, up to the time of the lease is included in the historical cost figure.

The inventory was classified according to the State of New Jersey Board of Public Utilities Commissioners' uniform system of accounts for street railways. In certain cases the value of property that was used jointly for railway operation and other purposes, such as the Terminal Building in Newark, has been included in its entirety in the account covering operative property, it being assumed that in fixing a rate base, incidental receipts from rentals of such property would be taken into account.

Miscellaneous physical property held for rent and other property which is not anticipated will be required within any reasonable period for either maintenance or operation was included in Account 404. All construction and equipment items of a special and incidental nature which could not be properly charged to any other account are included in Account 550-B "Miscellaneous construction expenditures."

The Cooley appraisal as of Dec. 31, 1915, was used as the basis for detailed inspection and measurement after being spot checked in sufficient detail to verify accuracy. Additional charges to plant since that time were obtained from the company's construction records, and verified as to character and condition by inspection. These capital additions up to Jan. 1, 1921, amounted to $1,514,260. One-man safety cars, trailer cars and service equipment totaled $1,479,342 of this amount.

Two bases of prices were used to obtain an appraisal of the property in terms of pre-war money and present-day money. The pre-war prices were generally the average of prices ruling between 1910 and 1915. Present-day prices were those current Sept. 1, 1920.

All land was appraised by real estate men. Prices fixed were based on normal market values for the highest general use. Strictly special use, such as for railway purposes, was not considered or allowed for. Locality value, the value of adjoining or neighboring land, were considered. Allowance wherever justified was also made for plottage or assemblage, continuity and special adaptability, although only bare land values as of the normal grade were used. Cuts and fills were considered as improvements.

The estimated cost of plots, abstracts, notarial fees, recording deeds, etc., as well as assessments levied by public authorities, amounts payable for construction or improvement of roads, streets, etc., were added to the appraisers' bare land value.

Overhead charges were defined as expenditures made for the work as a whole and which could not be apportioned accurately among the various inventory items.

Pre-construction costs embrace the formulation of the initial plan and interesting a group of individuals sufficiently strong to bring the project to maturity; the preliminary legal and technical studies; the securing of title and franchises; the legal and technical presentation of the project to secure financial interest, and the securing of options.

An examination of the company's books and records, previous experience in similar research for other properties of the same character, as well as recognition of the fact that in most cases when financial interest has been secured there is usually a reorganization or settlement involving a recognition of profit to the original projectors and developers, showed these costs to amount to 2.1 per cent of the reproduction costs based on present-day prices and 3.3 per cent of the reproduction costs under pre-war conditions.

The construction period was construed to begin when the financial interest had been secured. Before actual construction can begin, it is necessary to secure an ample and complete supply of materials and to negotiate many of the necessary contracts. Six months is taken as an estimate of the time necessary. To construct the whole property it was estimated would take from four to five and one-half years.

The administrative organization laid out to carry on this construction was divided into six parts, namely, administrative, legal, engineering, construction and purchasing. The allowance for administration and legal expenses was found to amount to 1.75 per cent of the reproduction costs exclusive of real estate based upon present-day prices and 2.5 per cent under pre-war prices. Real estate expenses were estimated at 3 per cent under current prices and 2 per cent for pre-war costs.

The engineering work was construed either to have been handled by a staff organized by the company or an established engineering firm. In either case the cost would be about the same for actual results. In addition the employment of consulting engineers would be necessary to perfect and insure the design of all parts of construction and equipment. The services of architects and local engineers would also be necessary. A weighted allowance of 3.5 per cent of the reproduction cost exclusive of real estate under present prices and 5 per cent under pre-war prices was used. Engineering and superintendence for the real estate under present-day conditions was estimated at 0.8 per cent, while for pre-war conditions 0.5 per cent was used.

Interest during construction was treated as the net interest accruing on construction expenditures before the property for which expenditures were made is placed in operation and as each portion of the road went into service the interest account was relieved of that portion. Interest was estimated at 6 per cent for pre-war prices and at 8 per cent for present-day basis. Funds, it was estimated, must be on hand for an average of a month and a half before disbursement. Two per cent per year was allowed for estimated bank balances.

In calculating taxes during construction credit was allowed for that portion of the road which would go into operation each year and the tax account relieved to that extent. The average amount of taxes was found to be 0.9 per cent of the reproduction cost for each set of prices.

Financing expenses cover services, expenses and reasonable profits thereon in connection with the wholesale and retail marketing of securities. Such expenses are estimated in per cent of the total funds required and the allowances were based on actual experiences of the Public Service Corporation, upon similar data determined for other companies and upon the judgment of experts in this line of business. Based on the foregoing 7.5 per cent was allowed for present-day prices and for the reproduction costs under pre-war conditions 5 per cent.

PERCENTAGE ALLOWANCES FOR GENERAL OMISSIONS AND CONTINGENCIES

Account	Way and Structures	Per Cent
504	Grading	2
510	Track and roadway labor	5
514	Elevated structures and foundations (foundations only)	10
515	Bridges, trestles and culverts	3
516	Crossings, fences and signs	3
517	Signals and interlocking apparatus	3
518	Telephone and telegraph lines	3
519	Poles and fixtures	5
520	Underground conduits	5
521	Distribution system	5
524	Stations, miscellaneous buildings and structures	3
525	Wharves and docks	5
	Equipment	
530	Passenger and combination cars	0.5
532	Service equipment	0.5
533	Electric equipment of cars	0.5
534	Locomotives	0.5
536	Shop equipment	3
538	Miscellaneous equipment	3

So far as they reflect quantities, unit prices, incidentals and contingencies, an allowance for omissions was included in quantities and unit prices. Except for the construction and equipment accounts, additional allowances have been made for general omissions and contingencies which were not covered in the quantities and unit prices. The percentages so allowed and listed above cover expenses corresponding to a contractor's carrying charge, charges made during the progress of construction, strikes on the work and delays affecting the delivery of materials or prosecution of work, omission in cases of scattered property difficult to inventory, collateral work on outside structures not now apparent, such as relocation of other pole lines, etc., and delays due to legal obstruction.

The inspection method was used to get the determination for accrued depreciation. Obsolescence was allowed only where replacement could be definitely foreseen. Obsolescence due to future improvements in the art was not considered.

INTANGIBLE ELEMENTS OF PROPERTY

The intangible elements of property, that is, the elements not represented by physical property, are represented by the company's income, the market for the securities, etc. Four elements as defined below were considered.

In determining "going value," four to five years was considered a reasonable time in which to build up the business and to perfect the organization. It was impossible, however, to determine from the records kept by the company the actual cost of developing the business. It became necessary therefore to make certain assumptions. These were based on the piecemeal plan of construction, variable rising wages, operations continually shifting, requiring changes in the amount of service for different districts. Actual expenditures incurred in carrying the organization and eliminating the weak and inefficient elements therein were merged in the operating accounts. Then, too, no record was kept of the inadequate return on investment during early operation.

Weighing these points, it was found that on the basis of present-day prices for labor and material the cost of going value amounted to 8 per cent of the reproduction cost of the physical property and based upon pre-war prices it amounted to 6 per cent.

Consolidation value is defined as the element of value which attaches to a strong unified system as contrasted with the uneconomical condition under which smaller companies operate in the same or adjacent territory. The element of value due to consolidation in the existing system is estimated by comparing its operation with that of a number of smaller independent companies. Savings due to consolidation should result in more efficient routing of cars, reduction in maintenance and fixed charges on excess trackage, reduction in the cost of maintenance of equipment by passing the work through consolidated shops in larger quantities and reduction in equipment investment. Inspection of car operations can be put under a single head, as well as way and structure maintenance. A large company has more ability to secure money usually at cheaper rates of interest than smaller companies.

Savings in the larger consolidations involving 117 companies were estimated in detail and amounted to a total of 3.65 per cent of the total cost of service. In the cases of other consolidations involving only a dozen or more companies the saving was estimated at 1.89 per cent of the cost of service.

TABLE V—ESTIMATED COST OF REPRODUCTION NEW—OPERATIVE PROPERTY, PUBLIC SERVICE RAILWAY

		Pre-War Prices		Sept. 1, 1920, Prices	
		Reproduction	Accrued Depreciation	Reproduction	Accrued Depreciation
501	Engineering and superintendence	$2,660,869	....	$4,191,732	....
502	Right of way	4,430,845	....	4,781,863	....
503	Other land	6,001,837	....	6,001,837	....
504	Grading	2,477,857	$625,887	6,091,060	$1,549,813
505	Ballast	1,360,685	160,292	2,599,673	320,497
506	Ties	1,533,631	720,584	3,634,570	1,707,062
507	Rails, rail fastenings and joints	5,381,808	1,561,918	10,237,305	2,972,485
508	Special work	2,561,894	995,542	4,937,945	1,918,866
510	Track and roadway labor	2,717,178	853,859	6,938,434	2,180,516
511	Paving	6,260,165	2,435,524	14,312,086	5,675,349
512	Roadway, machinery and tools	85,253	24,581	159,880	46,384
513	Tunnels and subways	217,867	10,893	471,145	23,557
514	Elevated structures and foundations	595,572	75,321	1,269,267	148,143
515	Bridges, trestles and culverts	1,339,031	168,452	2,662,677	313,339
516	Crossings, fences and signs	187,005	21,586	387,667	44,808
517	Signals and interlocking apparatus	202,812	57,161	458,731	129,552
518	Telephone and telegraph lines	50,791	15,198	122,939	36,797
519	Poles and fixtures	1,090,651	358,769	2,584,225	827,281
520	Underground conduits	395,056	59,215	961,581	144,142
521	Distribution system	3,431,267	579,887	6,323,816	1,069,128
522	General office buildings	2,847,529	217,003	6,259,725	477,858
523	Shops and carhouses	3,176,003	992,471	7,539,477	2,342,833
524	Stations, miscellaneous buildings, etc.	419,990	98,815	983,702	231,795
525	Wharves and docks	552,356	175,732	1,346,027	430,851
530	Passenger and combination cars	7,226,120	1,805,446	17,704,251	4,423,407
532	Service equipment	457,889	114,403	1,145,627	286,235
533	Electric equipment of cars	5,110,462	1,333,831	12,108,732	3,160,380
534	Locomotives	6,834	1,754	17,001	4,379
535	Floating equipment	773,160	537,702	2,242,164	1,559,334
536	Shop equipment	550,061	186,914	1,199,133	407,472
537	Furniture	240,405	83,932	458,919	127,092
538	Miscellaneous	124,185	54,255	188,256	82,248
546 550	Law expenditures Administration expenses	1,513,006	....	2,376,242	....
547	Interest during construction	5,301,194	....	14,558,074	....
549	Taxes during construction	619,620	....	1,236,063	....
550	Miscellaneous:				
	(a) Preconstruction costs	2,066,023	....	2,689,735	....
	(b) Auxiliary operation items	172,403	55,862	438,739	142,902
	(c) Financing expenses	3,738,400	....	11,485,100	....
	Additions to capital account	628,173	....	1,514,160	....
	Going value	4,710,000	....	13,170,000	....
	Consolidation value	5,600,000	....	11,700,000	....
	Total	$88,815,887	$14,382,789	$189,489,560	$32,784,505

NOTE—The above totals for accrued depreciation were increased by 2.63 per cent for present-day prices and by 3.75 per cent for pre-war prices, representing one-half of the structural overhead costs for engineering and superintendence and for administration and legal expense to obtain the totals shown in the table given in the ELECTRIC RAILWAY JOURNAL April 16, 1921, page 747.

Setting aside that percentage from the cost of service in 1904, following the general consolidation in 1903, gives total savings of $361,500 as of that time, which if capitalized at 6 per cent equals $5,160,000. To this should be added $440,000 covering the subsequent additions, making a total of $5,600,000.

In arriving at the element of consolidation value applicable to reproduction under present-day prices, the estimate for pre-war prices was increased in proportion to the increase in physical value as compared with pre-war prices, thus allowing only for the decreased purchasing power of the dollar.

In addition to the savings accruing to consolidation the element of consolidation value can also be evidenced by expenditures made to effect the consolidation. Expenses on account of this element were determined by considering the price paid for a given property, the cost of the physical property, and the earning power. Expenditures made to effect the principal consolidations based on these considerations was estimated to have been at least $7,300,000.

The book value of the railway power facilities turned over to the electric company under the 999-year lease of July 1, 1910, was approximately $5,169,000. This was less than the reproduction cost new of such facilities based upon prices for labor and material prevailing at the time of the lease.

During 1920 the railway company paid $3,992,000 for electrical energy furnished under this lease. This amount included an allowance for interest at the rate of 8 per cent on power facilities turned over July 1, 1910, and the actual interest paid the electric company in accordance with the lease on additions made by the electric company.

The cost to the railway company of producing and delivering an equivalent amount of energy from a modern plant was estimated at $5,000,000, thus indicating a saving through the power lease for the year 1920 of $1,119,000, which capitalized on an 8 per cent basis amounts to $13,980,000. Adding this amount to the book costs of facilities turned over to the electric company makes a total of $19,149,000 for present-day prices.

Under pre-war prices the saving through the operation of the power lease amounted to $492,000, which capitalized at 8 per cent amounted to $6,025,000. This then added to the new book cost of facilities totaled $11,994,000.

In view of the fact that this lease is between two companies controlled by the same holding company, these profits add no specific value to the lease. The potential value, however, has been given consideration.

WORKING CAPITAL

The allowance for working capital was defined as the requisite amount of materials and supplies it was necessary to carry in stock to meet the regular demands for operation and maintenance of the property. To this should be added a sufficient amount of cash to meet promptly all payrolls and bills presented.

The value of supplies carried on Jan. 1, 1921, amounted to $1,520,709. The amount of free cash on hand should equal at least one month's operating expense, which amounts to $1,860,567. Adding these totals gives $3,381,276 as the amount of working capital necessary.

The actual investment as of March 31, 1919, as determined by Mark Wolff on behalf of the New Jersey State League of Municipalities at the time of the zone fare hearings was $93,662,873. Additions and corrections were made in this figure to bring it up to Jan. 1, 1921, as follows:

Historical cost:		
Estimate of Mark Wolff as of March 31, 1919		$93,662,873
Add—Payments omitted 1893 to 1898 to B. M. Shanley account of:		
Consolidated Traction Company	$420,515	
Orange & Passaic Railway	658,000	1,078,515
		$94,741,388
Deductions—		
Account of three errors of transcription	$1,072,980	
Substitution of actual figures for estimates on costs in several cases	376,545	1,449,525
		$93,291,863
Add capital additions on books of company to Dec. 31, 1919		2,562,245
Add corrections made in overhead allowances on original estimates changed from 3.5 per cent 19.7 per cent of total expenditures, which includes overhead costs equivalent to 10 per cent on construction expenditures—April 1, 1919, to Dec. 31, 1920, to cover financing expenses and interest and taxes during construction amounting to $256,224.		14,862,840
		$110,716,948
Less $2,000,000 paid railway on assumption of power lease plus correction error of $123,315		$1,876,685
Total historical cost		$108,840,263
Add intangible values not shown on books—		
Going value	$4,710,000	
Consolidation value	5,600,000	10,310,000
Total value definable as historical cost		$119,150,263

SUPERSEDED PROPERTY

The value of superseded or abandoned property, not including salvage of the existing railway company and its predecessor companies prior to the end of their useful life, amounts to $4,701,943. An itemized list of this property follows:

Horse cars, cable, dummies, buses, etc		$2,620,000
Subsequent to electrification:		
Track	$652,064	
Power plant equipment	344,097	
Distribution system	49,926	
Car and equipment	652,673	
Abandoned track	68,479	1,767,239
Total		$4,387,239
Fare zone expense		314,704
Total		$4,701,943

An analysis by accounts on both reproduction price bases follows, together with other pertinent information concerning the physical property owned by the company.

Avoiding Transfer of Surety Bonds

IT IS now possible to bond the position instead of the individual employee. This plan of bonding all responsible positions was recently entered into by L. T. Hixon, auditor Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., with the result that the annoyance of having to transfer a bond from one person to another whenever there is a change in employees is eliminated. The company simply takes out a blanket bond, covering all bonded positions listed in an attachment made a part of the bond, for the amount specified for each position. The portion of the bond covering any particular position may be discontinued, or the amount covering a new position added on, at any time by deducting or adding the corresponding amount to the rate. This type of surety bond, which is understood to be a new development of the service of the National Surety Company, is said to be very liberal in character and to be available at practically the same rate as the old type individual bonds. The blanket bond is simply renewed yearly and that is about all the attention required.

Don't Hate Your Customers

A Talk to the Platform Men of Georgia Railway & Power Company by Its President

Preston S. Arkwright

Delivered March 31, 1921

I HAVE often wondered what you motormen and conductors think of the work you are doing. You get up early in the morning, many of you before day, frequently in the cold of the winter—you have done it many days before. You go down to the barn, get out your car, same car you got out yesterday, take it out on your route, over the same old street you ran on yesterday, and the day before that. You turn on and off the current, put on and off the brakes, running along a familiar street that you have run on many a time before, to the end of the line. You pick up the controller handle, walk through the car to the other platform, then run back over the same route to the other end of the line. Then you pick up the controller handle, walk through the car to the other platform and come back again.

The conductor rides with you on the back platform, ringing the bell for you to go, ringing the bell for you to stop, calling out the same old streets, when he calls them out at all. And so you go, five, seven, nine and eleven hours every day, day after day, month by month, year on year, in the rain, in the cold, in the sleet, Sundays, holidays, Christmases, finally reaching home again, late in the night, some of you in the early hours of the next morning. Oh! the dreary monotony—if you think that way about it.

Even at that it's no more monotonous than most other jobs.

How would you like to be a bookkeeper, perched on a high stool making figures in books all through the day, day after day and year after year, seeing nothing but figures, engaging in no activities of any kind, simply recording figures of the results of work that other men do?

How would you like to be a mechanic turning threads on bolts, doing nothing else but this, shut up in the shop all day, just turning threads on bolts all the time, day after day?

YOUR JOB IS WHAT YOU MAKE IT

How would you like to run an elevator, up and down the shaft, seeing nothing of the outside, just up and down the same shut-in shaft all the time. I know a man who does this very kind of work and he is the happiest and most cheerful man I know. He runs the elevator in this company's own office building. He makes it his business to make things brighter for everybody that works in the building. You really ought to go up and take a lesson from him.

As I say, if you think that's what your job is then that's what it is, and if you let your mind dwell on the monotony of it then you will not only never amount to very much at it, but it will drive you crazy some day.

If you'll take the right view of it you'll find your work altogether different from this. You are furnishing transportation service for a whole city. We people of Atlanta are very proud of our growth from a little crossroad village reduced to ashes in the Civil War to a city of over 200,000 inhabitants. This couldn't have been done without you—you made this growth possible. You've got more right to be proud of this city's growth than any other single enterprise in it. You've taken the greatest part in bringing it to pass.

We are very proud of the Candler Building, for instance, and the other sky-scraping office buildings that mark out the skyline of the town. The people who built them took especially great pride in them, so much so that they gave them their names; Candler Building, Hurt Building, Grant Building, etc. These buildings couldn't exist without the work that you do. You transported the mechanics who put them up, you bring back and forth the tenants that occupy them. So you have had a part in the building of them. Your work entered into it.

RAILWAY MEN HELP ALL BUSINESSES

We are very proud of our fine churches. Atlanta has an unusual number of fine churches, with eloquent preachers and large Sunday congregations. These churches couldn't exist in the numbers they do except for the work that you are doing. There would be no congregations for eloquent preachers to preach to if you didn't bring them in. Why, the very reason you can't go to church yourselves is in order that there may be congregations for churches to hold.

You bring the teachers and the children to the schools. You are helping to educate the children of the community. They couldn't come to the schools except for the work that you do. So that your work, in part, is the education of children.

Mr. Howard recently erected a very fine theater that's an ornament to the city. He is very proud of his theater, as he has a good right to be. The whole city of Atlanta takes pride in pointing to the theater Mr. Howard built. You helped to build this theater. You brought the mechanics to the job, you bring the audiences to see the pictures. There couldn't be any theater without the work that you do. There wouldn't be enough people here to sustain it, and they couldn't get to it except for your work.

You take the workmen to the shops maintaining the equipment that runs on the railroad. You run our cars all night taking the train crews to and from the railroad yards, and you bring the passengers to and from the stations. You have a part in the transportation system of the country.

There are many beautiful residence suburbs around Atlanta. There are thriving, growing, prosperous suburban towns, such as Decatur, East Point and College Park. Where would they be but for the work that you do? People couldn't live in the suburbs. They would be huddled in dark, unsanitary, congested tenement houses except for the work that you do.

So all of the activities of the community, its entire prosperity and well-being and growth depend on the basic fundamental service that you are doing. You are not simply turning controller handles and ringing bells. You are making possible the city and all of its activities and you have a share in the accomplishment of everything worth while that anybody does here. This is why you have to get up in the morning before anybody else. This is why you have to stay at work until everybody else has gone to bed. This is why you work on Sundays, holidays and Christmases. There couldn't be any other work in a city of this size but for your work and there wouldn't be any Sundays or any holidays or any Christmases that people could enjoy.

You have got a right to be proud of the work you do. There is no other so necessary, so useful or so valuable.

I don't know why it is, but I think it is true some people look down on street car men. I don't know what the cause is. Maybe its a hangover from the days when we drove a mule; or because our transactions are in little money; or because we're so poor.

Perhaps we are responsible for it ourselves. I think we have had a low estimate of our work and a poor opinion of ourselves. Nobody is going to think any more of us than we think of ourselves, that's sure. If we think we are common trash, then other people are going to think we are common trash, and common trash we are and will remain. So, above all, have a good opinion of yourselves and a good opinion of the work you are doing. Take a pride in it.

YOU HAVE A POSITION OF RESPONSIBILITY

This company has confidence in you and trusts you. It puts in your charge the car, which is pretty valuable, costing from $5,000 to $15,000. It trusts you with its money. It trusts you with its responsibility for damages. It trusts you with its reputation.

The public has confidence in and trusts you. They trust their own lives and safety to your care. They put their wives and little children in your charge, confident not only that you will save their persons from injury but will protect them from all harm.

You have a position of trust and responsibility and are performing a work of great importance.

Don't go at it just as a temporary or despised job to make a living out of. If you feel you've got to eat to live, that you've got to make a little money to eat and that's why you do this work you are not going to get any happiness out of it and nobody is going to have any respect for you.

Sometimes we think the public is unfair and unjust to us. At times we are apt to believe they are our enemies. I won't let myself think that and don't you let yourselves think that. It isn't true. They are not our enemies, but whether they are or not don't think that they are. If you believe that the public are your enemies then you are going to be an enemy to the public, and if you feel that way about it, or if I feel that way about it, we are unfit to stay in this business. We are unfit to serve people if we are unfriendly to them.

These people are your customers. You are furnishing transportation for pay. They are paying to ride on your car. *Don't hate your customers.* If you were running a grocery store or a dry goods store or a clothing store would you hate a person who came in to buy things that you sold? Now you *are* running a store. You've got charge of the car. You want people to ride with you. You want them to pay to ride with you. You ought to feel friendly with them when they do ride with you. Show your friendliness to them. Be glad to have them get on your car. Have a spirit of welcoming them. If you will show friendliness to them they will show friendliness back to you.

I have never myself been discourteously treated by a motorman or conductor. I have never witnessed discourteous treatment by a motorman or conductor of any other passenger. As a matter of fact I have very rarely been discourteously treated by anybody. Generally I think it is our own fault when we are discourteously treated. I know that some motormen and conductors do treat passengers discourteously. Sometimes I think it is due to the fact that some passenger regards the motorman or conductor as a menial servant. He shows this in his treatment and naturally you resent it. Sometimes you have got a chip on your shoulder and you take offense when no offense is intended, or you've got a grouch and you take it out on the passenger. Naturally he comes back at you.

COURTESY MUST BE INSTINCTIVE

Be considerate of passengers. This doesn't mean that you've got to apologize for living or that you must adopt a cringing attitude. It simply means that you are to put yourself in the passenger's place and treat him in the manner you would like to be treated by him. I am not talking about rules of etiquette. Pretense of good will or veneer of manner or slobbering over people is not going to get by. You've got to have the right spirit about it. You've got to like the work and want to do it properly in order to do it right. If you will get the right spirit all forms and rules of politeness will take care of themselves.

You run these cars every day and a lot of the same people ride with you day after day. You know them. Show that you know them. Learn their names, speak to them by their names. There is nothing that flatters people more than to be recognized and called by their names.

You come in contact with a great many people. This company transported about 95,000,000 passengers last year, or about 260,000 a day. In the early morning you meet the mechanics going out to construction jobs; you carry the people to the mills and factories and workshops; the clerks and business people and sales people to the offices and stores and business houses; you bring in the school teachers and the children to the schools and colleges; then come the women to shop in the stores; you carry people all day long on their various missions of business or pleasure or social intercourse. In the afternoons here come your passengers trooping back from the factories, the mills, the buildings, the shops, the schools, the stores and the offices. You bring the husband back to the wife at night and the mother back to the children. You reunite the families at home. You bring them out again to the amusements in the evening. You've got a part in all their various activities. Not only this but your treatment influences their happiness and the character of their work.

If you are grouchy in the morning you pass the grouch on to the men and women who go into the factories, the mills, the shops, the schools, the offices or the stores. You spoil their day. They pass on the grouch they have got from you to the people they come in contact with. If you pass your grouch on to the returning passengers at night they pass it on to the home circle. If you are cheerful and happy you will better the work and the lives of all of these people you transport and all of the people they come in contact with. Nobody made us engage in this work, nobody keeps us in it against our will. If we don't like it let's get out of it. If we stay in it let's be happy about it.

You owe it not only to yourselves and to the company, but you owe it to all the other men in this business with you to have the right attitude and spirit toward this work and to conduct yourselves so as to deserve the respect and good will of the public you serve.

Sometimes in an organization this large a dishonest man will creep in. The passengers notice this man knocking down fares. They immediately say that all street railway conductors are damned thieves.

Sometimes the motorman or conductor will be uncouth and rude or even insulting, we'll say, to some lady passenger. The passengers who observe it will say that all motormen and conductors are boors.

Whatever one motorman or conductor does reflects on all the other motormen and conductors. So not only get the right attitude yourselves but interest yourselves in seeing that all the others have the right attitude. If there are those among us who are not fit to be here let's run them off. Let's raise the public's estimation of the street car man.

If we have respect for ourselves, the proper appreciation of the work we are doing, and the right attitude toward our customers, we will deserve the respect of the public and their co-operation and support. And when it comes to pass that we shall get them—as it surely will—how happy we shall be.

British Railway Electrification Situation

Standardization of System and Equipment Recommended—Electrification Advocated as Most Economical Method of Reducing Terminal Congestion and of Increasing Capacity of Suburban Lines

IN ENGLAND, much more than in the United States, it is realized that if the electrification of the railways is to be undertaken on a large scale some standardization of system and equipment will be necessary. A great step in the direction of uniformity was made by the recommendation last year of the Ministry of Transport, in the opinion of London *Engineering*, that direct current at 1,500 volts should be generally adopted for the electrification of the British railways. It is to be hoped that this decision will put an end to the battle of the systems. Anyway, a reasonable decision is better than none at all.

Sir Philip Nash, in a paper recently read before the Institute of Transport, sums up briefly the British situation in regard to electrification. It appears, he said, to be taken for granted that the general replacement of steam locomotives by any system of electric traction on the trunk lines of England is far beyond the range of practical policy at present. The chief point for immediate consideration is the extent to which railway operation would be benefited by the electrification of suburban lines and large city terminals. There are also certain cases where special conditions of the line or of the traffic may indicate electrical operation to be best, but, generally speaking, the center of interest lies with suburban passenger traffic.

At the same meeting, Sir Herbert Walker, in advocating further electrification, said that the traffic on the electrified portion of the London & Southwestern Railway had increased from less than half a million passengers a week in 1915 to more than a million per week today. During the same period the operating costs of the electrified lines had increased by only 100 per cent, although the corresponding cost of steam-operated lines had increased by 200 per cent.

A somewhat similar story was told by Sir William Forbes with respect to the Brighton lines. Electrification had enabled the mileage run to be increased by 150 per cent with an increase of 200 per cent in earnings. The financial result had been a return of more than 15 per cent on the capital spent in electrification. The company was putting forward proposals at that time for the electrification of the Brighton main line, although the return on the fresh capital required for this conversion would be but 6 or 7 per cent.

The real factor which is doing more than anything else to keep the question of electrification strongly before the English railway companies is the ever-increasing difficulty of handling suburban, and especially terminal, traffic with steam-drawn trains. It is said that 1,200 trains per day enter and leave Liverpool Street station, London, and in spite of capable organization on the part of the railway officials and good humor on the part of the public, the conditions at times have been almost intolerable. The traffic has outgrown the facilities of the station, and the experience of the railways like the Southwestern shows that many more passengers are ready to travel if a sufficient number of trains is provided. Electrification may be costly as a solution for this difficulty, but when the only alternative is the enlargement of the whole station and the duplication of track and platform, the installation of electrical equipment may be decided upon merely as the lesser evil. Moreover, the incidental advantages of electric operation at terminal stations in cities are by no means negligible.

In regard to the general railway situation in England, the lines are in a run-down condition. A recent report made to settle the accounts between the government and the roads deals largely with the arrears of maintenance of normal wear and tear and replacement of stores. No less than 2,100 fewer locomotives were given heavy overhauls in 1919 than in 1913, though the light repairs to keep these engines at work numbered about the same for these years. Heavy repairs on other equipment, such as coaches and freight cars, were in a like proportion. This condition seems to point to the fact that though the stock was kept running, it was yet decidedly behindhand in upkeep.

Capital expenditure, which for many years before the war used to run to about £10,000,000 per annum, amounted to only £12,500,000 altogether between 1913 and 1919 for Great Britain and £700,000 for Ireland. The total mileage of the railways of the country in 1919, reduced to single track, was 56,000, about 800 miles more than in 1913, the increase being nearly all in sidings.

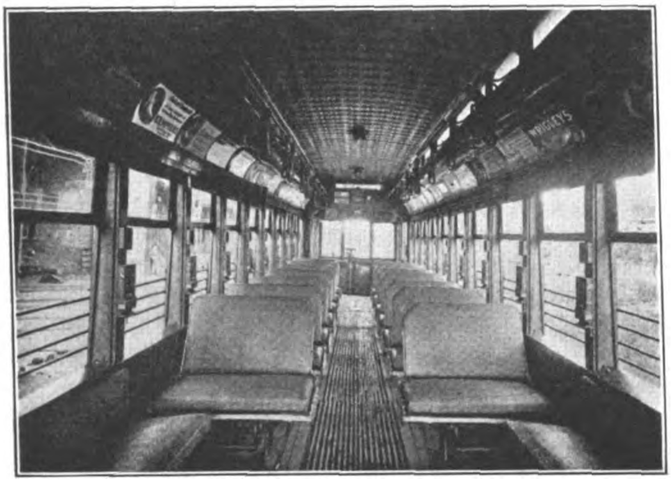
The most noticeable item, in the report mentioned above, under the heading of "Modes of Traction," is an increase of 2,732,000 engine-miles by electric traction due to the improved electric services.

Machine Sells Gum to Railway Passengers

Novel Vending Device Proves Profitable—Its Use Brings Out Fact that One Passenger in Twenty-five Will Buy 5-Cent Packages of Gum on Cars

SELLING gum to street railway passengers is a new pastime, but it is being done with success in Little Rock, Ark. Two or three years ago, J. H. Mann, Jr., of Pine Bluff, Ark., conceived the idea of building a machine to sell a standard 5-cent package of gum, rather than the 1-cent pieces so frequently sold. In wondering where to place such machines, it occurred to him to place them on street cars. A machine was developed, and a number of them were tried out experimentally for several months on some of the cars of the Little Rock Railway & Electric Company. Finally a satisfactory foolproof machine was evolved. It is designed to lock against the depositing of a coin if the machine is empty, and also to prevent the insertion of a blank or slug.

For more than a year, about 1,200 of these machines have been in successful operation on the cars in Little Rock. A demonstration was made on ten cars of the Dallas Railway which resulted in a contract for the installation of about 3,000 machines on the Dallas cars. Arrangements have been made for a test run at Knoxville, Tenn., and several other systems at this time are considering having demonstrations made.


INTERIOR OF A CAR WITH VENDING MACHINES PLACED ON WINDOW POSTS

The statistics of the past year in Little Rock are of interest. An average of forty-eight cars were equipped during the year, and on these a gross business of more than $27,000 was recorded. From this, of course, the number of 5-cent sales could be calculated and when this number was compared with the total number of passengers riding on those cars it was found that 4 per cent of all the cash-fare passengers riding on the cars so equipped had purchased gum.

The proposition which the manufacturer makes to the railways is to pay them a percentage of the receipts for the privilege of installing the machines in the street cars.

These vending machines are manufactured and distributed by the Transit Vending Machine Company, Pine Bluff, Ark., and another corporation, the Transit Sales Company, operates them. The operating company maintains the vending machines, fills them at night and extracts the coin when the cars come into the carhouse. On a basis of 10 per cent of gross receipts to the railway, the manufacturer estimates that a railway company operating 100 cars might expect to receive from this source a revenue of approximately $7,500 a year.

More recently, the machines have been loaded with mints of the "Life Saver" variety, which seem to sell as effectively as gum. The machine, which weighs 3 lb., is built of steel. It is bolted to the posts between car windows.

Wages on the Steam Railroads

SO MUCH has appeared in the daily papers in regard to hearings on steam railroad wages that an official statement by the Association of Railway Executives is welcome. This is given in Table II and shows the figures relating to representative classes of railway employees under "national agreements," with the increase in number of these employees and increase in compensation. The increase in the number of men employed is largely due, in the opinion of the Association of Railway Executives, to rules and working conditions which reduced the output per man and were introduced while the railroads were under government control.

TABLE I—PERCENTAGE INCREASES OVER 1914 OF WAGES OF STEAM RAILROAD EMPLOYEES AND COST OF LIVING

Year	Per Cent Increase in Average Wage Over 1914	Per Cent Increase in Cost of Living Over 1914
1915	1.83	2 (Dec.)
1916	9.31	15 (Dec.)
1917	23.04	32.2 (Dec.)
1918	73.89	69.3 (Dec.)
1919	81.74	93.5 (Dec.)
1920*	121.32	113 (June)
1920†	134.07	94.5 (Dec.)

* Before wage award. † After wage award.

The statement made by the Association of Railway Executives also includes a table of increases in wages since 1914 with percentage increases in cost of living as reported by the National Industrial Conference Board and by the Bureau of Labor. These figures are shown in Table I.

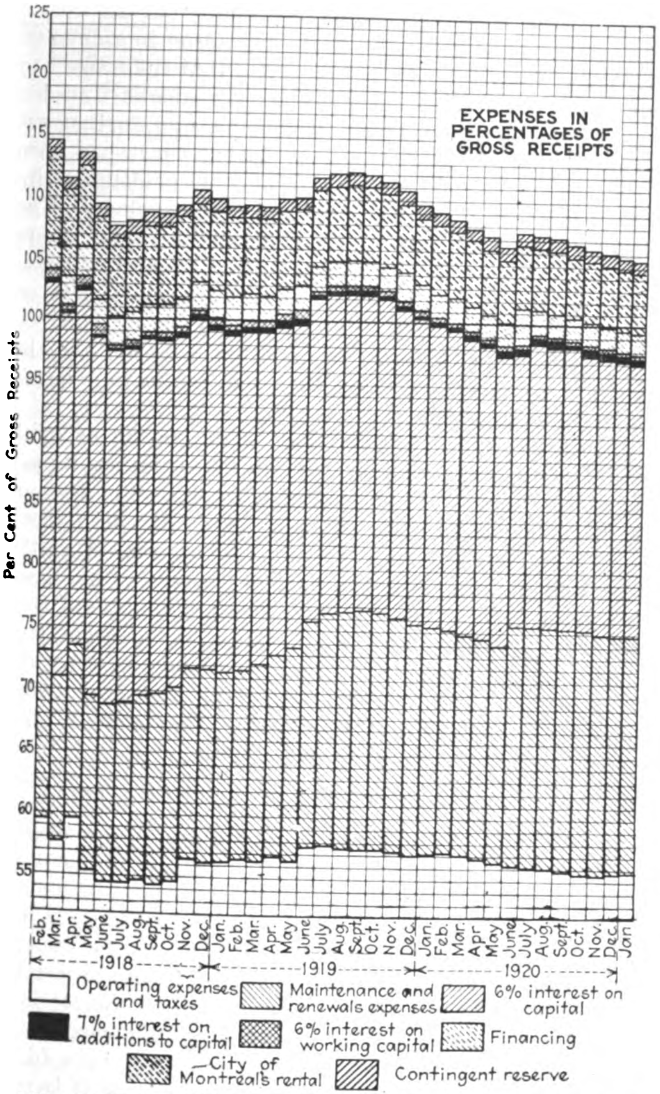
TABLE II—SHOWING INCREASE IN NUMBER AND PAY OF REPRESENTATIVE CLASSES OF STEAM RAILROAD EMPLOYEES UNDER NATIONAL AGREEMENT

Class of Employees	Number in Service 1917	Number in Service a 1920	Increase 1920 Over 1917, Per Cent	Average Annual Compensation, 1917	Average Annual Compensation, b 1920	Increase 1920 Over 1917, Per Cent
General foremen—M. E. dept	1,549	1,859	20.0	$1,661	$3,039	83.0
Gang and other foremen—M. E. dept	18,043	25,488	41.3	1,352	2,786	106.1
Machinists	41,112	64,861	57.8	1,394	2,382	70.9
Boilermakers	12,931	20,504	58.6	1,425	2,473	73.5
Blacksmiths	8,115	10,807	33.2	1,258	2,237	77.8
Painters and upholsterers	11,087	12,223	102	950	2,029	113.6
Electricians	9,564	14,460	51.2	1,030	2,335	126.7
Air brake men	5,904	8,064	36.6	1,086	2,350	116.4
Car inspectors	19,661	26,349	34.0	1,141	2,425	112.5
Car repairers	66,531	89,239	34.1	993	2,116	113.1
Other skilled laborers	52,989	59,733	12.7	1,065	2,229	109.3
Mechanics' helpers and apprentices	86,021	129,757	50.8	822	1,638	99.3

a First quarter, 1920. b July wage award included for twelve months.

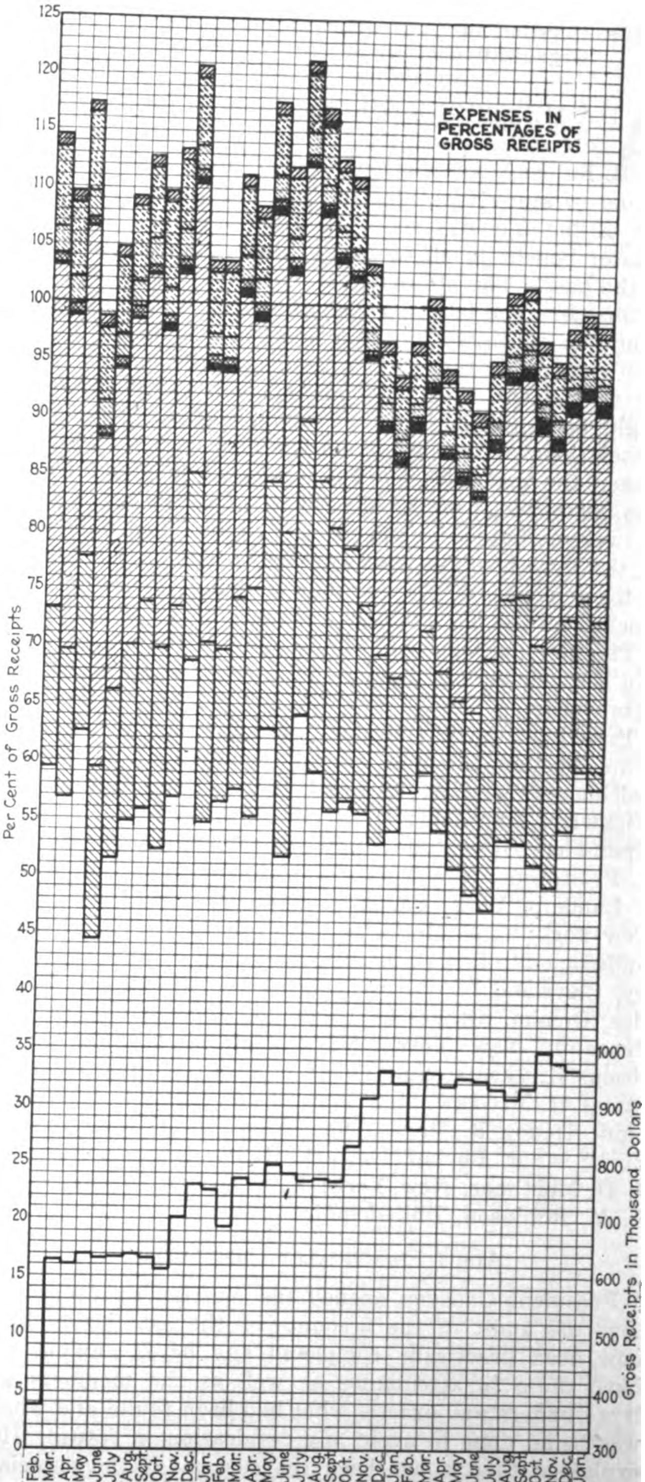
Service-at-Cost Results in Montreal

AT THE Ottawa convention of the Canadian Electric Railway Association, held Jan. 31 and Feb. 1 and covered in the issue of this journal for Feb. 5, Col. J. E. Hutcheson read a paper on the results secured under the service-at-cost franchise in Montreal. He exhibited some charts, two of them in colors, which showed the data in concrete form, these charts having been prepared for the Montreal Tramways Commission. The charts were not available for publication at the time, but arrangements to this end were made later and the data were brought up to a considerably later date than those shown in the convention. For the reader's convenience the graphs have been combined to render them more readily comparable and they are reproduced on this page.



CUMULATIVE EXPENSES UNDER MONTREAL FRANCHISE ITEMIZED, EXPRESSED IN PERCENTAGE OF CUMULATIVE GROSS RECEIPTS

In both charts the expenses are itemized under eight heads, the percentages being laid off one above the other in the following order: Operating expenses and taxes, maintenance and renewal expenses, 6 per cent interest on capital, 7 per cent interest on additions to capital, 6 per cent interest on working capital, cost of financing, rental due city of Montreal and contingent reserve. For convenience these are expressed in terms of gross receipts, the actual monthly values of which, to January, 1921, are given in the right-hand column. Referring to the right-hand chart, it will be noted that since November, 1919, the gross receipts have usually exceeded the expenses, so that a substantial reduction in the deficit was made during 1919. This deficit was accumulated while the actual authority of the commission to regulate fares was being determined in the courts. Colonel Hutcheson stated in his paper that the earnings per passenger were as follows: Feb. 10 to Sept. 30, 1918, 4.09 cents; Oct. 1, 1918, to Oct. 31, 1919, 4.80 cents; Nov. 1, 1919, to Aug. 31, 1920, 5.85 cents; Sept. 1 to Nov. 30, 1920, 6.09 cents.



DETAILS OF OPERATION UNDER MONTREAL FRANCHISE, MONTH BY MONTH

At top, itemized expenses expressed in percentage of gross receipts. At bottom, gross receipts in dollars per month.

American Association News

EXECUTIVE COMMITTEE DECIDES AGAINST EXHIBITS AND WILL ANNOUNCE CONVENTION CITY SHORTLY—APPOINTMENT OF NEW SECRETARY POSTPONED PENDING REPORT OF COMMITTEE ON PLAN AND SCOPE—NATIONAL ELECTRIC RAILWAY DAY TO BE CELEBRATED MAY 4

Executive Committee Holds Important Meeting

Settles Question of Convention and Will Make Study of Organization of Other Associations Before Appointing Secretary

AT A MEETING held in New York on April 16 the executive committee of the American Electric Railway Association decided to appoint a committee to study carefully the needs of the association and of the industry so as to make the association of greater benefit to all of its members than it has been in the past. The opinion was generally expressed that at this time and before a successor to Secretary Burritt should be appointed it would be most desirable to make such changes in the organization as might adapt it better to efficient work and to get such suggestions as might be available from the working of other national associations of somewhat similar character. For this reason the appointment of a successor to Mr. Burritt was postponed, pending the report of a new committee of twelve, whose selection was left to President Gadsden. At the same meeting it was decided not to have exhibits at the convention this year, but no definite decision was reached on the place for the convention.

The meeting was held at the office of the association and the members of the executive committee in attendance were:

President P. H. Gadsden, Philadelphia; Vice-Presidents Britton I. Budd, Chicago, and C. D. Emmons, Baltimore. Members of the executive committee, E. F. Wickwire, Mansfield; H. R. Mallison, Montreal; J. N. Shannahan, Hampton; W. H. Sawyer, East St. Louis; R. P. Stevens, New York; W. G. Gove, Brooklyn; John J. Landers, York, Pa. Past-Presidents W. Caryl Ely, New York; T. N. McCarter, Newark; Charles L. Henry, Indianapolis; L. S. Storrs, New Haven; John J. Stanley, Cleveland; C. L. Allen, Syracuse; George H. Harries, Omaha. Others in attendance included Frank W. Frueauff, New York; M. B. Lambert, Pittsburgh; Joseph K. Choate, New York; J. G. Barry, Schenectady; James H. McGraw, New York; S. M. Curwen, Philadelphia; Henry R. Hayes, New York; B. C. Cobb, New York; M. R. Boylan, Newark; H. G. Bradlee, Boston; J. D. Mortimer, New York; E. C. Faber, Chicago, and A. M. Robinson, Philadelphia.

AUDIT PRACTICALLY COMPLETED

President Gadsden opened the meeting by declaring that the audit of the accounts of the association had now been practically completed and he is anxious to have those in attendance as well as the members at large understand exactly what had been found and what was being done to avoid any defalcation in future. He explained that it has been the custom of the association for the past fifteen or twenty years to have the books audited in the fall of each year by members of the auditing department of the Public Service Railway of Newark, N. J. When the time came for the audit last September, the auditors were requested by the former bookkeeper of the association, W. O. Gibson, to wait so that the books could be written up. Several other attempts were made to conduct the audit, but an excuse of one kind or another was made by Gibson in each case. When a start was made, it was found that the books had not been written up since June. President Gadsden was immediately notified by telephone, and further examination by the auditors showed that there had been defalcation. When confronted by the evidence, Gibson admitted that $31,000 had been taken. The plan was that when he wanted money he would secure the signature of the secretary, who had perfect confidence in him, to a bank voucher and then would make no return of the voucher. The largest amount taken on any single voucher seems to have been $5,200, and the evidence at hand indicates that the defalcation began about August, 1919.

President Gadsden said that after consulting with several members prominent in the association and near at hand he secured the arrest of Gibson, who is now out on $15,000 bail. Up to this time no evidence has been found that any one else is criminally involved in the case, and Mr. Burritt, the former secretary, has been actively assisting the auditors. The prosecution of Gibson is in the hands of Carl R. Miner, an attorney connected with Hodenpyl, Hardy & Company, and the evidence so far indicates that the defalcation is between $40,000 and $50,000. It is possible that some of this may be got back from the defaulter.

WORK OF THE ASSOCIATION WILL NOT SUFFER

Fortunately the finances of the association, according to President Gadsden, are such that it will not actually suffer so greatly from the defalcation as might be expected. The reason for this is partly because of the increase in dues adopted last year and partly because with the higher fares prevalent on most properties and with the dues based on a percentage of the receipts, the amounts received have considerably exceeded the expenses of the association. Economy will have to be used, but no assessment will be required, and it is possible that with economical operation the rate of dues may be reduced next year. Mr. Gadsden added that he considered before this disclosure that the railways had run through the gamut of adversities, but this trouble certainly capped the climax. Nevertheless, he thought that the members might feel that the motto of the Salvation Army applied to them, namely, that a railway man may be down but he is never out.

As regards the immediate future, the association with the cash on hand and receipts expected during the rest of the year will have resources of about $100,000, and expenses of about $77,000, leaving a balance of between $22,000 and $23,000. This does not include, however, any amount for the salary of a secretary who might be appointed. He did not believe that the work of the association would be embarrassed in any way provided the president should be authorized to borrow on notes a sum not to exceed $10,000. In regard to bonds, he explained that the bookkeeper was under a bond of $2,000 and the secretary under a bond of $20,000, but owing to some unexplained reason these policies had been allowed to lapse. The policy for $20,000, however, did not lapse until December of last year, and most of the defalcation had occurred before that date. Mr. Gadsden then said that in the emergency he had asked Mr. Welsh, at that time statistician of the association, to act as secretary pro tem. Mr. Welsh has performed the duties of this office in a very satisfactory way and the thanks of the association were due to him.

APPOINTMENT OF SECRETARY POSTPONED PENDING REPORT OF PLAN-AND-SCOPE COMMITTEE

Taking up then the question of the appointment of a secretary, Mr. Gadsden said that seven or eight names of possible candidates had been presented by members, but said he himself had no one particularly to recommend. He felt that in any such selection the president of the association should not take a preponderating part, as the president is a temporary officer only, whereas the secretary, if he is the proper man, will guide the affairs of the association long after the president has retired to the ranks.

Nevertheless, while he had no candidate for the position, Mr. Gadsden said that he had very positive views of the type of man who should be selected. In his opinion the time has come when the association should be set on a higher and broader plane of usefulness. Up to three or four years ago it was only a small organization with a budget of from $30,000 to $40,000. Everybody knew most everybody else, and the secretary's office was a sort of social headquarters for visiting railway men. This was all right so far as it went, but in the future the office should be a place where much more effective work should be done for the benefit of the industry. The future secretary should be a leader, a man with vision and personal force, some one to do the thinking for the industry as a whole.

Committee on Plan and Scope of American Electric Railway Association Announced by President Gadsden April 19, 1921

President: P. H. GADSDEN.....Philadelphia

Past-President: JOHN H. PARDEE, New York

Vice-Presidents:

BRITTON I. BUDD	Chicago
C. D. EMMONS	Baltimore

Members of executive committee:

R. P. STEVENS	New York
W. H. SAWYER	East St. Louis

Membership at large:

JOHN G. BARRY	Schenectady
H. V. BOZELL	New York
H. G. BRADLEE	Boston
HARLOW C. CLARK	Newark
B. C. COBB	New York
MYLES B. LAMBERT	Pittsburgh

The president said he thought the association could learn much from the practice of the National Electric Light Association and the American Gas Association, both of which were doing work largely along the lines which he had in mind. Then he asked whether it would not be wise to reorganize the association along such lines and then look around to see who would manage it.

In response to Mr. Gadsden's request for different members to express their opinion there were remarks from Messrs. McCarter, Budd, Bradlee, Curwen, Sawyer, Mortimer, Stanley, McGraw and Cobb, all of whom expressed themselves in agreement with the sentiments expressed.

The motion was then made and carried that the president should be authorized to appoint a committee of twelve to make a study of the needs and opportunities of the association, to take as long as was needed and to report its recommendations with suggestions as to the name or names of men qualified to carry out the work of directing the work of the association. It was decided also that this would include the future publication policy of the association as regards *Aera*. Mr. Gadsden then said that he was sure that the committee would welcome suggestions from the members of the association as to ways in which the work of the association could be improved or desirable changes in the plan and scope of the organization of the association. He said he would not announce the membership of the committee at that time, but did so on April 19. The names appear in the panel on this page. Mr. Gadsden then said that he had asked the auditor of the association, Mr. Boylan, to prepare a statement of the entire financial situation to be included in the minutes of the meeting.

Several resolutions were then adopted. One was that for the present checks should carry two names, that of the president and that of B. A. Hegeman, Jr. Another was that the president would be authorized to issue a note for $10,000 to care for any immediate liabilities of the association.

CONVENTION IN OCTOBER, BUT WITHOUT EXHIBITS

John G. Barry, chairman of the committee on location for the next convention, was then called upon to present the report of that committee. Mr. Barry explained that the committee had canvassed the question of an exhibit at the next convention and had also conducted a poll of the manufacturer members of the association. The recommendation of the committee was that there should be no exhibit. The presentation of the report of Mr. Barry was followed by a general discussion as to the relative merits of different cities for the meeting. An early announcement will be made. It was decided that the convention would be held during the week beginning Oct. 2, and the president was authorized to confer with the committee on subjects to determine the length of the meeting, whether it should be four days as usual, or a shorter time because of the omission of exhibits.

OTHER BUSINESS TRANSACTED

Mr. Stevens for the Transportation & Traffic Association then asked the association to appoint a committee to take up certain phases of the one-man car situation, particularly to decide whether it would be worth while to compile considerable data in regard to the use of one-man cars and if so how best to obtain it. The motion was passed.

The president then announced that Frank Hedley, president Interborough Rapid Transit Company, had resigned as a member of the executive committee of the association on account of lack of time to attend to the duties of that office. The resignation was accepted.

The president then gave some figures of the number of requests for information that were being received by the association from member companies to indicate that the number of requests was increasing, showing that the normal functions of the association were going on and that it was of increasing benefit to the members.

E. C. Faber, Chicago, and Labert St. Clair of the association office, then gave some particulars as to the work of the committee on publicity. They explained that it is hoped to make May 4 a "National Electric Railway Day." On this day electric railways would be encouraged to emphasize the progress which had been made in the electric railway art during the last forty years and the additional service which these companies were now rendering the public. The date, May 4, was selected because it was the anniversary of the completion of the Richmond road in 1888. Mr. St. Clair then explained that a pictorial history of the industry was being compiled showing the growth and enormous increase in the investment, and the obsolescence to which such apparatus was subject. Mr. St. Clair also presented examples of car cards and other advertising, as well as other work of the department.

A discussion then followed on various methods of publicity. Mr. Budd told about the work of the Illinois Committee on Public Utility Information and said that a number of utility officials in Illinois had volunteered to be prepared to make addresses on utility problems before Chambers of Commerce and other organizations when requested to do so. Other speakers on the subject included Mr. Faber, Mr. Storrs, General Harries, Mr. Wickwire and Mr. Lambert.

The concluding business of the association was a discussion as to whether municipal properties should be admitted as members of the association, but no final action was taken. The meeting then adjourned.

National Electric Railway Day

MAY 4 has been designated by the American Electric Railway Association as National Electric Railway Day for the purpose of calling public attention to the present highly effective transportation service that the electric railways now render as compared to the service a third of a century ago. Electric railways throughout the country are urged to give the lesson of improved service on that day by displaying early-day cars, particularly horse cars, and by drawing attention to the improvements over former-day service. The big lesson, of course, that can be drawn from the display is that although service has greatly improved fares have scarcely increased, if, indeed, they are not lower in many cities, with the diminished value of the dollar, than they were in the old horse-car days, when the short hauls were in vogue.

May 4 has been selected because it is an important day in electric railway development. Thirty-three years ago on that date the contract for the first successful overhead trolley line to be conducted on a large scale was completed in Richmond, Va. Thirty cars were put into service.

A suggested program for the day and mats of photographs of early cars have been prepared by the advertising section of the Division of Information and Service and are being sent to member companies. Among the plans suggested are to man the early car with a crew which has been long in the service, offer prizes to school children for essays on the history of the local transportation system and provide the trainmen with badges carrying the words "National Electric Railway Day," etc.

Distribution of F. E. R. C. Report

ACTING Secretary J. W. Welsh of the American Association has notified member companies that a limited supply of the complete proceedings of the Federal Electric Railways Commission report, bound in buckram, are available. As far as the supply will permit, the association will furnish without charge a complete set of the volumes to any city or college library, or to any city official designated by a member company. As the requests must come through the member companies and as the librarians may not know about the report, it devolves upon electric railway officials to take the initiative in seeing that their local college and public libraries are given an opportunity to secure these volumes.

Hoover Resigns as President of American Engineering Council

AT ITS meeting in Philadelphia on Saturday, April 16, American Engineering Council of the Federated American Engineering Societies accepted the resignation of Herbert Hoover as president. Mr. Hoover gave as his reasons for resigning the fact that the council was, by its constitution, necessarily engaged in furthering national activities which involve legislation and that he as a member of the executive branch of the Government could not consistently direct such activity as an officer of American Engineering Council. The council expressed regret at Mr. Hoover's retirement, and voted its appreciation of his leadership during the organization period of the council and his initiation of policies and effort.

The meeting of the council was one of the most important yet held. The committee on the elimination of waste in industry presented a preliminary report and indicated some of the benefits to be derived by American industry from the final report.

L. W. Wallace, executive secretary, reported on the employment service of the council and made recommendations for its broadening, which were adopted. He also explained the activity of the council with respect to licensing of engineers, which was in line with the policy previously announced and indicated in these columns. Other matters reported on were publicity, petitions of the council for appointment of an engineer as Assistant Secretary of War, not obtained, and an engineer to the Interstate Commerce Commission, still under consideration, and other relations to the executive branch of the Government.

The next meeting of the council will be held in St. Louis on June 3.

Trackless Trolley at Leeds

RECENT reports from Great Britain indicate that Leeds is preparing for trackless trolley service in one section by providing a bituminous concrete wearing surface over the present paving and tramway tracks, completely burying the latter. The Leeds Corporation Tramways is said also to have under construction a trackless vehicle of the double-deck type, to seat fifty persons.

According to present plans this vehicle will be provided with pneumatic tires.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Open Shop Likely

Present Controversy at Davenport Would Seem to Leave This as Only Course Open

The open shop looms up as a strong possibility in the industrial policy of the Tri-City Railway, Davenport, Ia., after June 1 as a result of two moves against the traction lines founded on a contract with the trainmen's union.

First came an injunction suit by the Socialist city attorney restraining the company from putting into effect a wage reduction from 70 to 40 cents an hour. The Socialists in the City Council had previously refused the company permission to install one-man cars and otherwise economize.

For this reason the company is bound under this injunction to keep a 70-cent scale until June 1 or to continue losing money and meet the exacting demands of a ruinous contract although the company states that this contract was negotiated on the understanding that wages could be reduced if the Council did not grant a fare sufficiently high.

Again, matters were complicated for the company with the public when a state board of arbitration found against the railway in a dispute over the discharge of a union official. The board found that the company erred in not submitting this dispute to arbitration in accordance with the terms of its contract with the trainmen.

Editor Thinks Company Erred

Last year a compulsory arbitration clause in the contract brought an increase in wages from 60 cents to 70 cents an hour. During times of rising wages the contract did not protect the company as it voluntarily raised the wage above the contract scale in order to secure an adequate supply of labor.

For these reasons there is a strong probability that when the unions refuse to accept the contract the company might feel justified in suggesting that employees will be hired and paid as the company shall see fit and not in accordance with the terms of any contract—in other words, the open shop.

The finding of the state board of arbitration against the Tri-City Railway growing out of the discharge of the union president by the company has provoked considerable discussion. An editorial writer in one of the local newspapers stated that in view of this decision of the board the company should reinstate the discharged union president. He stated that the discharge had been caused by a public address made by the union president and that employees' associations would employ business agents if their officers could not speak without fear of discharge.

While the board which considered the matter of the discharge found the company was in error in denying the arbitration of the controversy, it did not recommend the reinstatement of the discharged union official, stating this was not within its province.

Wage Reduction Accepted Willingly

A group of former employees of the Eastern Massachusetts Street Railway, some of whom have been out of work since that company ceased operation of its lines in Woburn, recently held a meeting in one of the carhouses and sent a letter to the trustees signifying their willingness to accept a reduced scale of wages if the trustees will resume operation in that district. A short while ago a similar communication was received from some of the men who worked on the Gloucester lines before that division suspended operations.

Cleveland Men Accept Wage Cut

MEMBERS of the union in Cleveland, at a referendum election on April 15, voted 2,158 to 348 in favor of a 20 per cent reduction in their wages effective May 1, when the present agreement with the Cleveland Railway expires. They ratified the wage cut rather than submit the matter to arbitration along with the proposition of permitting the open shop question to be an issue in arbitration proceedings.

Starting on May 1 trainmen in Cleveland will receive 55 cents an hour for the first three months of service; 58 cents for the next nine months and 60 cents an hour after the first year, instead of 70, 73 and 75 cents an hour, the rate which has been in effect. The company will still pay time and a half for Sunday and holiday overtime, but only time and a quarter for overtime on week days. Extra pay for spreads of more than fourteen hours on swing runs is abolished. There will be no eight-hour limit for runs on Sunday and holidays as in the past, nor will ten hours' pay be given for eight-hour runs on night cars.

Officials of the Cleveland Railway estimate that the wage reduction for trainmen will save the company close to $100,000 a month. There is little prospect, however, of a change in fare under service-at-cost in the near future, for on April 1 there was a deficit of $50,000 in the interest fund, which must be built up to $750,000 before there can be a reduction in fare.

Wage Cut in Detroit

Mr. Burdick Reiterates Determination of Company to Reconcile Pay with Changed Economic Conditions

That the wages of the platform employees of the Detroit (Mich.) United Railway are to be decreased from 20 per cent to 28 per cent effective on May 1 was announced in a letter under date of April 15, addressed by E. J. Burdick, assistant general manager of the company, to officials of Division 26 of the Amalgamated Association. The decrease will put the men on the pay basis which existed before the wage increase of last May. It is being made because the company can no longer support the present pay roll and render adequate service to the public.

The pay for all motormen and conductors in passenger and freight service except those employed on the Pontiac and Flint city lines will be as follows: for the first three months, 50 cents an hour; for the next nine months, 55 cents an hour; after twelve months in service 60 cents an hour. The rates for Pontiac and Flint city line employees will be 2 cents less an hour in each of the three classes.

In his letter Mr. Burdick calls attention to the fact that since Jan. 1, 1916, wages of the low rate men have been increased 180 per cent, of the middle rate men 143.33 per cent, while the wages of the high rate men have been increased 134.38 per cent during the same period. A table showing the fluctuations of living costs for the period included between Jan. 1, 1916, and April 9, 1921, is included in the letter.

The present rates of pay received by the three classes of men are 70 cents, 73 cents and 75 cents an hour. The reductions to 50 cents, 55 cents, and 60 cents an hour will mean decreases of 28.57 per cent, 24.66 per cent and 20 per cent. The new rates will exceed the 1916 rates by 100 per cent in the case of the low rate men, 83.33 per cent for the middle rate men and 87.50 per cent for the high rate men.

A reduction in pay to all employees except motormen and conductors was made effective on Jan. 1, of this year. When the company proposed last December to decrease the wage rates of platform employees 20 per cent, the union officials questioned the company's right to open the wage question at that time. The men were willing to arbitrate the matter and an arbitrator was appointed by the company and one by the men. The two arbitrators were, however, unable to agree on a third arbitrator to complete the board.

No opinion has been expressed by the union officials as to whether or not the proposed wage cut will be accepted.

Utilities Commission Re-created

Kansas Industrial Court Overloaded and Another Body Is Created to Supervise Utilities

Governor Allen of Kansas, having found the Kansas Court of Industrial Relations too busy to handle the public utilities of the state in addition to the industrial question, addressed a special message to the Legislature on this point, and as a result that body has re-created a utilities commission to replace the one which had been abolished at the time of the creation of the Industrial Court and whose function had been assumed by the Industrial Court.

COMBINED HEARINGS PROVIDED

The new law provides, however, that cases involving question of wages, industrial conditions, or other industrial disputes, within the normal jurisdiction of the Court of Industrial Relations are to be heard as a combined case and determined at the same time by the Public Utilities Commission and the Court of Industrial Relations sitting as one body. The presiding judge of the Court of Industrial Relations is to preside at the hearing, and in the event of a tie vote the presiding judge of the Court of Industrial Relations is to cast the deciding vote.

National and local interest attached to the operations of the Kansas Court of Industrial Relations from the inception of that body. The fear that arose when it was proposed to re-establish the Utilities Commission that the advantageous feature would be lost of having one court look into both sides of a utility question, with regulatory power over labor as well as over capital, was overcome by placing a case which involved both labor and rates of fare before both commissions as a combined body. This fear, although pronounced, was shown by Governor Allen to be largely groundless, for in his message to the Legislature he pointed out that out of 650 public utility causes before the Industrial Court in the past year only three related directly to the subject of both rates and wages.

DUAL AUTHORITY CAUSED CRITICISM

In his argument for the re-establishment of the Public Utilities Commission Governor Allen pointed out that the unfortunate results of adding public utility administration to the work of the Court of Industrial Relations was to make up public utilities law paramount and the work of the Industrial Court incidental. Moreover, the Industrial Court had been unable to touch many duties of general industrial development. The Governor said:

> In addition to the criticism of the court, due to lack of time for proper industrial work, it has suffered constant misrepresentation out of the unavoidable confusing of its purposes with the purposes of the public utility work. During the year in which the old Public Utilities law had been administered by the Industrial Court, there has been 650 public utility cases. The court has deemed it wise in a great number of these cases to increase public utility rates.
>
> Notwithstanding the fact that none of the principles of the Industrial Court law were concerned in these public utility increases, every criticism that has come as the result of the increase in public utility rates has been placed, not upon the old Public Utilities law, but upon the new Industrial Court.
>
> Public utility regulation thus was dramatized as a new thing which had its origin in the Court of Industrial Relations. The fact was lost sight of that it was a work carried on since the establishment of the Board of Railroad Commissioners in 1883, and the Industrial Court became familiar to the public, not upon its merits, but upon the activities which attend its regulation of public utilities in a peculiarly trying period.
>
> Public utility administration, instead of becoming incidental to the Court of Industrial Relations, became distorted into the chief aim of the new court. The big, real purpose of the labor court was lost to public view. The real purpose and value of public utility regulations also became subjected to the unreasoning attack of those who as a result of labor politics was fighting the Industrial Court.

Judge Clyde M. Reed, one of the members of the Industrial Court, was made chairman of the new Public Utilities Commission. Further facts with relation to the personnel of the commissions will be given in a later issue.

God Bless Stone & Webster!

The Seattle *Daily Times* recently closed its contest and awarded prizes for the best solution of Seattle's municipal street railway problem, for which a prize of $200 was offered. In the final analysis, the *Times* was unable to decide upon a single plan. In consequence, two winners were picked by the judges, and the full sum of $200 was awarded to each.

The prize-winners were selected from the twelve contestants who had won prizes of $25 each in the weekly contest. The two prize-winning solutions were submitted by E. H. Severson and C. T. Conover. Mr. Conover said:

> There is only one thing to do—get down on our knees to the former owners of the street car lines, humbly and contritely beg their foregiveness, give assurance of a fair deal in future and make the best arrangement possible for a return of the lines. This would involve granting a fair equitable franchise and affording the company absolute security from persecution by the City Council. Perhaps nothing of this sort can be accomplished but it is the only hope.
>
> Stone & Webster came into this city and bought up a lot of disconnected lines, some of them in the hands of receivers. The money was supplied by several thousand middle class New England people—some by the estates of widows and orphans—all invested on Seattle's good faith and prospects. The company became the largest employer of labor in Seattle and, until harassed by the City Council, gave us an admirable car service and made all reasonable extensions. It paid the largest burden of taxes of any corporation in Seattle and in addition paid a gross earnings tax; had to help build bridges, pave streets, etc.
>
> It became the sport of the City Council; it was baited and harassed and strangled until no further extensions were possible; the equipment fell off and dividends practically ceased. Then the city stepped into the pit it had dug, surrendered the vast revenue from taxes and undertook to operate by political means what had very nearly failed under efficient private management, besides paying for the system from the revenues.
>
> Every sane man knew it could not be done. There is only one solution: On what basis, if any, will Stone & Webster take the system back, assuming that they can be assured that the property will not again become the football of political opportunists?
>
> Meantime we must elect to the City Council men pledged to fight to the last ditch to prevent the $15,000,000 of utility bonds from becoming a general obligation and whose pledged word is known to be good. After that we shall have to "let nature take its course."

Purchase Negotiations Begun

Detroit United Railway Accepts Gracefully the Will of Voters and Helps City

Conferences are being held between the attorney for the Detroit United Railway and city officials with a view to starting negotiations for the city to take over eight day-to-day agreement lines of the railway as approved by the people at the recent election. According to Mr. Stevenson, counsel for the company, engineers for the company are now working on the cost figures of these eight lines. The figures will be taken from the company's books and will be based upon the cost of tracks and equipment.

PRICE MAY BE ARBITRATED

The day-to-day agreement lines were built by the company but the city reserved the right to take over the lines at cost less depreciation at such time as it was desired to operate them as part of a municipal system. It is the mutual belief of the company's attorney and the city officials that a board of arbitration will be resorted to to settle the price to be paid by the city.

While no definite views were expressed regarding the question of taking over the Fort Street and Woodward Avenue lines where franchises have expired, it was intimated by Mr. Stevenson that the company was willing to consider the views of the city at such time as the people decided that the city should take over these lines, with the idea of fully co-operating with the city in providing the needed service.

The Fort Street and Woodward Avenue lines, if joined with the lines the city is constructing and with those which it is planned to take over, will give the city two main lines to the heart of the city. The recent ruling of the Supreme Court upholding the legality of Mayor Couzens' municipal ownership system also held that the company's rights on Fort Street and Woodward Avenue having expired, these streets would have to be vacated any time the city desired. City officials believe that these lines will not be torn up but that they will be taken over instead in order that the people be subjected to as little inconvenience as possible. The voters may be called on to decide upon the purchase of the Fort Street and Woodward Avenue lines.

CROSSING QUESTION BEING ADJUSTED

The question of crossing of the company's tracks by city lines was also touched upon in the recent conference. Corporation Counsel Wilcox has filed a brief in the suit instituted by the city to determine judicially the city's right to make such crossings. A copy of the brief and blue prints of what the city considers the proper type of crossing have also been submitted to Mr. Stevenson. As soon as the company's engineers approve the blue prints, temporary crossings will be permitted until a type of crossing has been decided upon for permanent installation.

Agitation to Abolish Wisconsin Commission

Assemblyman Peterson of Milwaukee has announced that he will endeavor to have legislation enacted abolishing the present Railroad Commission. The idea is to substitute in its place a Public Service Commission with a membership of three, the personnel to be appointed by the Governor. It was Mr. Peterson who started the proceedings which resulted in the interpellation of the commission of Feb. 24 by Legislature regarding the commission's policy in dealing with public utilities.

An effort will also be made to have enacted an amendment to the public utility law which would require utility companies earning more than 8 per cent to place the excess in a sinking fund to be used to care for emergency conditions or for such other similar purposes as shall be determined from time to time by the proposed public service commission. The theory seems to be that the reserve fund would tide utilities over lean years and, perhaps, avoid increased rates. The measure will also provide that in fixing the value of a utility's property invested capital shall not be construed to include borrowed capital.

Whatever opposition exists to the present Railroad Commission will probably be mobilized in support of the Peterson legislation, but it is said to be doubtful whether this legislation will be enacted.

In connection with the attack upon the present commission, the Milwaukee Common Council has adopted a resolution instructing the City Attorney to draft legislation for introduction in the State Legislature abolishing all authority of the Railroad Commission over public utilities, vesting such authority in Common Council.

At the proceeding on Feb. 24, which revolved mainly around the Milwaukee Gas Light Company, Chairman Jackson of the Commission told the Legislature that the Milwaukee Gas Light Company, which had been recently granted a 20 per cent increase in rates, is earning only 3.7 per cent on its valuation as compared with 8 per cent considered reasonable by the commission. It was brought out that in the past ten years the Gas Company had declared dividends averaging 13.8 per cent and that in 1916 the dividend rate had been 23.7 per cent. Mr. Jackson pointed out, however, that the policy of Wisconsin regulation is to permit a fair return on the physical valuation basis and not to regulate dividends.

Trial Operation for Three Months

The railway system at Marietta, Ohio, has begun operations for a trial period of three months, during which time the officials of the company hope to demonstrate to residents of the community and city officials the exact financial status of the operation of cars in this city. One-man cars are being operated, with a 7-cent fare. Service is maintained over three separate routes, transfers being issued to other lines.

With the expiration of the company's franchise, a tentative agreement was reached between traction officials and members of the City Council whereby the present test of three months was started. During this time receipts and expenditures on the various city lines will be recorded in order to determine exactly the revenue derived from each. The Council is privileged to examine all books of the company during the trial period and to name an auditor to examine accounts. A detailed report showing the expenditures and receipts of each line will be filed with the Mayor within fifteen days after the expiration of each thirty-day period.

New York State Wages to Be Arbitrated

The employees of the New York State Railways in Rochester, Syracuse and Utica represented by their union officials and the officers of the company have signed an agreement providing for the arbitration of the differences caused by the proposal of the company to reduce the wages of the men 25 per cent. The action came as the finale of more than a week's negotiation.

As noted in the ELECTRIC RAILWAY JOURNAL several weeks ago the company submitted a revised agreement to become effective on May 1. In this proposal it said that it felt that the wages as fixed by the National War Labor Board for trainmen under date of July 31, 1918, would be fair to all parties interested under the contract. The company also outlined changes which were desired in working conditions. It explained at that time that the wages of the employees had been increased 126.41 per cent over those paid at the beginning of the war.

In accordance with the provision of the present contract calling for arbitration the company will appoint an arbitrator, the men will appoint an arbitrator and these two will appoint the third member.

Pending the decision of the arbitration board the working conditions of the 1920 contract are to remain in force, but the rate of wages in the company's contract submitted under date of March 29, 1921, are to become effective as of May 1, except that in no case will the differential be more than that of motormen and conductors on city lines. It has also been agreed that the question of wages to be paid men operating one-man cars will be determined by the arbitration board. The award is to be retroactive to May 1. Both sides agree to be bound by the findings.

Benjamin E. Tilton, vice-president and general manager of the New York State Railways, has been selected as the company's representative on the arbitration board. Mr. Tilton was the company's arbitrator in the settlement of the strike of last May.

Mr. Culkins Sees Municipal Ownership Ahead

That the final outcome of the railway tangle in Cincinnati, Ohio, might be municipal ownership of the local railways was intimated by William C. Culkins, Director of Street Railways, in a letter addressed to members of the Ohio Senate, condemning the Griswold bill limiting municipal indebtedness as it has been amended and now pending in the State Senate.

Mr. Culkins said in his letter that in behalf of the car-riding public he urged the Senators to use their best efforts to bring about the defeat of the measure in its present form, since it practically would nullify the constitutional privilege of owning public utilities other than water-works.

Part of the letter reads as follows:

> Although Cincinnati may never desire to exercise its purchase option, nevertheless it is within the range of possibilities that the present railway reorganization tangle can only be clarified by the city exercising its right to condemn and to buy the property.
>
> The passage of any legislation which would take away from the city the power to exercise its option would materially weaken its position in controlling the traction situation and would in my opinion represent a triumph of the traction lobby over the constitution of the State.

Mr. Culkins said that there was nothing new concerning a definite plan for scaling down of capital of the Cincinnati Traction Company, but from the tone of his letter to the State Senators it is believed by persons interested in the traction situation that the city wants to be in a position to carry out its rights and not be hampered or handicapped by such a measure as the amended Griswold bill.

Trackless Trolley Recommended

The General Electric Company has recommended that the trackless trolley system be considered in the disposition of the railway problem of Greenville, Tex., according to H. L. Andrews of the railway and traction division of the company, who has made a special report of the Greenville transportation problem.

A trolley car system for Greenville is estimated to cost a minimum of $251,600, which would provide five cars, the rebuilding of more than 9 miles of track and the construction of 2.72 miles of new track.

The estimated cost of the trackless trolley system with the same number of cars is given by Mr. Andrews as a minimum of $107,000 with the possible maximum of $109,300. The cost of installation of five storage-battery cars over the same mileage is given by L. Klopman, in a supplementary report, as $199,330.

Peoria Men to Ask Increase. — Motormen and conductors of the Peoria (Ill.) Railway are said to have prepared demands for presentation to the company calling for an increase in wages of 3 cents an hour. This would increase the maximum wage from 59 cents an hour to 62 cents.

Boston Elevated Trustees Report on Fares

Different Rates Refused for Competitive Parallel Routes—Trustees Hope to Reduce Basic Fare When Deficit Has Been Wiped Out

In a report just made to the Massachusetts Legislature the trustees of the Boston Elevated Railway not only reaffirm the prediction made in their last annual report that the deficit of last year will be wiped out by July 1, 1921, but further suggest the possibility of some slight reduction in the present 10-cent fare after that date.

THE present report was made as a result of a resolve of the Legislature requiring the trustees to report on the feasibility of instituting a 5-cent fare on the line from Fields Corner, in Dorchester, to the South Station, in Boston. This latter proposition, the trustees refuse to recommend, as the distance is too great, and what they consider more important, such a line would be in direct competition with the regular 10-cent lines.

The trustees reported that the introduction of a 10-cent fare under the requirement of the Public Control Act instructing the trustees to establish fares which would meet the cost of service, resulted in an increase of revenue which, with economies and new methods of operation, has since been sufficient to meet the cost of service. The installation of the 10-cent fare, however, was accompanied by a loss in traffic at first large, then gradually diminishing and not yet fully made good.

This loss was largely confined to two classes of travel, one within local limits in outlying communities and the other between the business center of Boston and localities in close proximity. The through traffic between this centre and localities at the greater distance was not seriously affected although there was some loss of riding among those living along the lines of steam railroads, especially near stations where the railroad fare was less than 10-cents.

Under the law the trustees had no power to make experiments that would jeopardize the total revenue necessary to maintain a self-supporting service. They could, however, make experiments that offered reasonable promise of restoration of lost traffic without material invasion of net revenue or without the imposition of any unjust burden upon the rest of the riding public.

The localities selected for experiment were those which seemed to offer short distance riding, without transfer, upon surface lines not connected with the rapid transit service. Eight lines of this kind have been established each with a 5-cent fare, restricted to certain hours and to days other than holidays and Sundays. Five of them proved failures and were discontinued, but three of them are still in operation.

The policy of the trustees is:

> To add a practically non-competitive new service, the net earnings from which are larger than the average earnings on all lines so as to increase net revenue and to enlarge the usefulness of the railway. To add a service which competes with the 10-cent lines and in so doing substantially lessen net revenue would be to impose an unwarranted burden upon the rest of the travelling public and to threaten a deficit to be assessed against the cities and towns.
>
> Any plan that would furnish this limited service to some communities and deny it to others which offer like conditions would be plainly unjustifiable.

NO DIFFERENTIAL ALLOWED

The investigation by the trustees of the demand for 5-cent fare to Field's Corner from the South Station disclosed facts that appear to prohibit such service. The distance covered by the proposed routes would be 3.6 miles in one case and 4.6 miles in the other. The distance covered by the line in South Boston is 2.8 miles, that in Charlestown 2.4 and that on Washington Street in Boston 1.9 miles. Whatever might be the receipts upon the proposed lines in so far as they represented restoration of lost traffic or new patronage, they would beyond question be too small to bring them within the rule which has been adopted in protection of net revenue. Vital factors in the situation therefore seem to forbid the establishment of these lines named.

Continuing, the report says:

> It does not follow, however, that the outlook for a limited cheap service in this district is hopeless. It lies rather in the direction of the experiment with another type of such service which, after a thorough investigation of conditions and upon a favorable report from General Manager Dana, has been introduced within a few days in Everett and Malden. This experiment is based upon the opportunity which physical transfer of passengers between surface cars and rapid transit trains at the Everett Terminal affords for an operating test of certain local lines in those cities under a low fare. The purpose is the restoration of local travel lost under the 10 cent fare with an increase in patronage that will mean more useful service upon lines where traffic is now light.

This experiment if successful the trustees say will have great significance in pointing a possible way to other restricted service in connection with the physical transfer now made, between surface cars and rapid transit trains. However—

> It is not to be understood that these experiments with limited service will be allowed to delay or interfere in any way with a future reduction in the 10 cent basic fare whenever conditions make it possible to bring it about. The general interest in that fare and paramount importance of the service under it constitute the reason for the restrictions upon all cheaper service which the trustees believe must be rigorously maintained.

No reduction can yet be made, the trustees say, in the 10-cent fare over lines which as a part of the entire system carry extraordinary cost of investment in subways, tunnels and elevated structures, and which rightly demand, as a fundamental need, speed, frequency of service and operation over long distances throughout the day and far into the night, on holidays and Sundays as well as on ordinary week days. Conditions now, however, seem to point toward the possibility of some reduction in that fare. The trustees in their last report predicted that the operating deficit outstanding on Dec. 31, 1920 would be absorbed before July 1, 1921.

The excess of receipts over expenditures for the first three months of this year has already reduced that deficit so that it is now practically assured that with the continued practice of justifiable economies the operating deficit of the earlier part of the year will have been made good, and the long outstanding deficit of $435,348.46 incurred in May and June of 1919 will have been eliminated. This result will make it possible for the trustees in their report of next July to outline the conditions under which and the extent to which some reduction in the 10-cent fare may be expected.

Phenomenal Record of Interurban Outlined

At the sitting of the Ontario Hydro-Radial Commission at Toronto during the week of April 11, Charles E. Thompson, assistant to the president of the Chicago, North Shore & Milwaukee Electric Railway, gave evidence. This is the commission that is considering the advisibility of building an electric railway from Toronto to Hamilton. Mr. Thompson went into the history of the road, its cost to construct and its cost to operate. He said that the labor bill now consumed 38.90 per cent of the total operating expenses. Wages for conductors and motormen ranged between 70 and 80 cents an hour. If the estimates of the Hydro Commission of Ontario at 55 cents an hour were applied to the North Shore railway the expenses of that company for labor would be reduced about $500,000 a year.

The witness told the commission that 1½ cents per mile was the lowest commutation rate the road could allow without piling up unprofitable business. In the early days, the roads offered specially low rates in order to attract business and as the years went by these rates became fixed in the public mind and it was very difficult to secure higher rates. He thought the roads should get higher rates for suburban service.

Power expenses now amounted to 49.80 per cent mainly through the increase in the price of coal, representing a 20 per cent advance. The operating ratio for the year was 76.83 per cent exclusive of taxes, and 80.41 per cent with taxes.

By liberal expenditure upon equipment the gross earnings of the road had been increased from $1,000,000 to $4,000,000 a year. This phenomenal increase had been secured in the face of competition with five other roads running from Chicago to Milwaukee. Passenger traffic had grown from 7,459,669 in 1916 to 13,288,186 in 1920, largely because adequate entrance had been secured to Chicago.

One-Man Car Invades Pennsylvania Avenue

Pennsylvania Avenue, Washington, D. C., is the latest railway thoroughfare to welcome one-man car operation. True, there is only one representative of this clan among the numerous green cars of the Capital Traction Company, which traverse this nationally important thoroughfare, but this one representative seems able to hold its own in the heavy traffic.

The car in question is not a standard safety car, but is one which was rebuilt in the shops of the Capital Traction Company from an old Stephenson single-truck longitudinal-seat car. This car was recently equipped for one-man car operation, and while the body, truck and electrical equipment are those of the old car it does have the complete safety device equipment of the standard safety car, furnished by the Westinghouse Electric and Manufacturing Company.

The mechanical details are unimportant, however, for the present purpose as the car was put on Pennsylvania Avenue, starting operation Sunday, April 10, for an experiment from the traffic standpoint. It operates on a route from the Georgetown carhouse to Seventeenth and Pennsylvania Avenue, Southeast, then returns to Twenty-sixth and G Street, Northwest, then returns to Seventeenth and Pennsylvania Avenue, Southeast, thence to Georgetown and repeat. This takes this car through the heaviest traffic of the day, when the regular double-truck cars are operating at scheduled speeds of 8.5 m.p.h. and on headways of fifteen seconds and sometimes less. This one-man car maintains its place in traffic with thorough satisfaction. It is attracting a good deal of attention on Pennsylvania Avenue for it is about the same size as the newly installed Sixteenth Street buses, which also operate for a short distance on Pennsylvania Avenue.

The Capital Traction Company is announcing no future plans with reference to one-man cars, either on Pennsylvania Avenue or elsewhere on the system, but has put this car in operation merely for experimental purposes.

Publicity Campaign for Schools and Libraries

The Indiana Public Utility Association is preparing special bulletins which will discuss the origin and growth of the public utilities in the State and their problems for distribution among the libraries and public high schools for reference work. The first bulletin, of a general character, will go into the public utility business from a broader standpoint, while the other bulletins, eight in all, will deal with the various utilities separately. For example, one will take up the interurban problem, one water, one gas, one telephone, etc. John Mellett, who is in charge of the work of the Indiana committee on Public Utility Information, sent out letters recently to 204 libraries and 128 high schools asking if they desired copies of the booklets. Within three days he had received eighty-six favorable answers from the libraries and fifty-eight from the high schools. Not one was unfavorable.

Construction Being Hastened

Municipal Road at Detroit Hopes to Complete 82 Miles of Line This Year

According to announcements by the city officials of Detroit, Mich., work will be pushed with a view to completing as soon as possible certain Municipal Railway lines to connect with the Detroit United Railway lines which the people voted to acquire from the company.

Proceedings leading to the taking over of the lines at issue will probably be started by a letter from the Street Railway Commission to the company to serve as official notice of the commission's intentions. The commission will probably ask the Detroit United Railway to name the price at which it will sell the railway lines the city proposes to buy. The value of the lines will probably be finally decided upon either by a board of arbitrators or by the courts.

Work has been started at several points on the new municipal lines as part of the program to build 82 miles of lines before the end of the present year. The municipal line on VanDyke between Charlevoix and Harper Avenues is expected to be in operation in about two months. It will be the third line put in operation, and will connect the St. Jean and Charlevoix lines now operating.

The sale of $2,000,000 of railway bonds has been authorized by the City Council, the proceeds to be used in financing the commission's construction program. They will mature in from twenty-seven to twenty-eight years. They are part of the $15,000,000 bond issue voted last year.

Suit for $100,000 damages has been brought against the city by John A. Mercier, the contractor who built some of the first sections of the municipal ownership line last year and whose contract for work on the uncompleted portion of the Charlevoix-Buchanan lines was canceled by the city. Mercier's previous suit to enjoin the commission from canceling his contract and proceeding with construction with its own forces was dismissed by Judge Hunt.

A. C. King has been appointed arbitrator for the city, and H. A. Crecelius, Chicago, has been appointed arbitrator for the Detroit United Railway in the matter of the crossing controversy resulting from the forced crossing of the company's Mack Avenue line by the St. Jean municipal line. No definite decision has so far been reached and the proposal has been made by Corporation Counsel Wilcox that the city be permitted to use the crossing temporarily, as it is now installed. If no agreement is reached the court will probably appoint a third arbitrator.

New Franchise to Be Negotiated in Vancouver

With the object of arriving at a fair and satisfactory agreement on the fare and franchise questions negotiations are to be commenced shortly between officials of the British Columbia Electric Railway, Vancouver, B. C., and representatives of the various municipalities on the mainland served by that system. Mayor Gale has announced that the city will be ready in a short time to enter into discussion of the proposed franchise requirements of the company. By agreement entered into with the city all negotiations on franchise and rate questions must be concluded before Aug. 1.

The company's future policy of extensions and improvements depends very largely upon the arrangements it is able to make in regard to franchise. The company has announced that it will be required to expend at least $1,000,000 before the end of 1922 on improvements to its Stave Lake plant to provide the power necessary to keep pace with the constantly growing demands of the city.

It is pointed out that if unreasonable regulations and starvation rates are exacted of the company by the city officials the problem of raising the necessary capital to make the required improvements will become increasingly difficult.

Italian Commission Will Arrive Soon

The Italian Commission on Railway Electrification, which expects to make an extended trip through the United States and Canada, visiting all heavy traction systems, will arrive from Europe on April 25 aboard the *Lorraine*. The commission is headed by Prof. Guido Semenza, consulting engineer, while the other members are Prof. Cian Giacomo Ponti, electrical engineer, Italian-American Electric Company; Marquis Ferdinando Cusani, manager, Italian-American Electric Company, and Curzio De Regibus, assistant chief engineer electric traction service of the Italian State Railways.

Besides all electric heavy traction installations the itinerary of the commission includes inspection of all urban rapid transit systems, the principal electric interurbans and many large electrical manufacturing plants. In addition such hydro-electric plants and high-tension transmission lines will be visited so that they may familiarize themselves with the most recent American practice regarding hydraulic power generation and transmission.

One of the main purposes of the delegation is to bring about better technical relations between Italy and the United States and a better reciprocal knowledge of the status of technology and electricity in both countries. This thorough investigation of the American transportation systems involving electric traction will probably keep the members of the commission in this country until Aug. 1.

Progress in Akron's Franchise Situation

The Merchants' Committee, chosen by the various civic organizations in Akron to assist in bringing about a satisfactory settlement of the street railway situation, is making progress toward ironing out the differences between the city and the Northern Ohio Traction & Light Company. The disagreement involves the sections of the franchise ordinance dealing with the method of valuation of the property and the rate of return to be allowed on that valuation.

The question of the valuation of the system seems in a fair way toward settlement. The city has secured the services of Hagenah & Erickson, the engineering firm that made an appraisal of the property for the city in 1918, while the company has secured the services of the firm headed by Dean M. S. Cooley of the University of Michigan, which it employed last year in making a valuation.

Hagenah & Erickson valued the city lines at $4,810,000 in 1918 while Dean Cooley placed a valuation of $7,200,000 on the lines last fall. It is expected the two firms will use their old valuations as a basis soon to reach an agreement. With the arrival at a valuation figure by these two firms the way will be opened for further negotiations when a settlement of the other points at issue will probably be reached without great delay.

Mayor Beck has announced that the Council will unquestionably pass any ordinance which has the approval of the civic organizations represented by the Merchants' Committee.

Taxpayers Still Attacking Purchase Deal

Attorneys for the Puget Sound Power & Light Company, Seattle, Wash., on April 11 filed an amended complaint in the United States court in an equity action against the fourteen taxpayers suing the city in the Superior Court. The equity action previously filed against the taxpayers, asking for a temporary injunction, was dismissed April 1 by Federal Judge Jeremiah Neterer, his order of dismissal, however, allowing an amended complaint.

The amended complaint alleges the taxpayers have combined and confederated together to induce and compel the city to default in and breach the contract between the city and the Stone & Webster interests, executed to provide for payment of interest and principal on the $15,000,000 bond issue by which the city bought the railway property of Stone & Webster for municipal operation.

It is alleged that action of the defendants in denying, and in continuing to deny, that the city is obligated to pay the interest and principal from the gross revenues of the railway, in case such gross revenues are not sufficient to also pay costs of operating the system and its maintenance, has impaired the value of the $15,000,000 bond issue by many thousands of dollars. The action asks for a temporary injunction preventing the taxpayers from continuing to make these alleged claims and assertions, and from making any attack on the special fund created by city ordinance for payment of interest and principal on the bonds.

News Notes

Arbitrator to Settle Wage Dispute.—The employees of the Scranton (Pa.) Railway are seeking increases ranging from 10 to 13 cents an hour. The company refused the demands and suggested that the men consider accepting a reduction in wages or submit all matters at issue to an arbitrator or board of arbitration.

Commission Bill Lost in Committee.—The Illinois House of Representatives has refused to take from the state public utilities committee the bill introduced by Representative Alpiner to abolish the Illinois Public Utilities Commission. It was a strict party vote, the Republicans supporting a motion to postpone action until April 21.

Chicago Men Want Contract Renewed Unchanged.—The trainmen's union of the Chicago Surface Lines voted unanimously on April 4 to notify the company that it desired a renewal of the present contract, without change, for another year. The agreement expires on June 1. Both parties to it are required to give at least thirty days' notice of any proposed change. The Surface Lines management has not yet indicated its position.

Municipal Ownership Proposed in Eureka.—The city of Eureka, Cal., wants to buy the street car system operated in Eureka by the Humboldt Transit Company and has asked the Railroad Commission of California to fix a value of the tracks, equipment of all kinds, franchises and lands owned by the company. The application asking the commission to determine the just compensation to be paid by the city was filed on April 12 by George W. Cousins, Mayor of Eureka.

Supervisory Jurisdiction Proposed.—A bill is pending in the Legislature of Pennsylvania which provides for the extension of the duties and scope of the Department of City Transit of Philadelphia to include a supervisory jurisdiction over street railways in addition to the authority the department now has over city-owned lines. The Council of Philadelphia has indorsed the measure, but the bill on April 15 was still in the municipal affairs committee of the Senate. Senator Vare is chairman of this committee. It is charged that he is holding up the legislation.

Commission Wants Its Powers Extended.—The creation of a Public Utilities Commission by converting the Florida Railroad Commission into such a body is recommended by the State Railroad Commission in its twenty-fourth annual report to the Governor. That body is preparing a bill for introduction in the Legislature at its April session to bring this about. The commission's plan for financing the new body includes the levying of a tax on the gross operating revenues of all electric railways, lighting plants, gas companies, water companies, etc.

Commission Lowers Wage.—The Kansas Public Utilities Commission recently decreed that the railroads cannot close small way stations, has set $40 a month as the proper wage for such station agents and has decided that such stations need not remain open throughout the day. The decision was the result of the roads' attempting to close a large number of small stations because the cost of operating them exceeded the revenue therefrom. The commission's ruling has broken a wage agreement with the Brotherhood of Railroad Telegraphers whereby the men were paid 53 cents an hour for an eight-hour day. It is expected that the union will appeal to the Industrial Court.

Program of Meeting

C. E. R. A. Summer Meeting

The Central Electric Railway Association has issued a bulletin describing the summer meeting and outing to take place on board the S.S. South American during a six-day cruise on the Great Lakes. As previously announced the boat will leave Chicago at 8:30 a.m. on June 26, arriving at Toledo on Tuesday morning. It will proceed from there to Detroit, and then on to Benton Harbor, returning to Chicago on Friday, July 1. Everyone is urged to take advantage of the entire cruise starting from Chicago; especially those living in that vicinity, for it will be convenient for them to take the boat there rather than to take a train to Toledo and embark from there. Tickets should be secured from John Benham, International Register Company, 15 South Throop Street, Chicago.

Tickets for trip on the steamship, including meals and berth and including Government war tax, are as follows:

Round trip ticket from Chicago to Toledo and return to Chicago, covering the entire cruise, $70 each.

Toledo to Benton Harbor including war tax, $35 each.

Toledo to Chicago including war tax, $37 each.

Children more than five and under twelve years of age and accompanied by their parents will be charged half the full fare. Children under five years of age will be carried free, but there will be a charge of 75 cents each for any meals served to them in the dining room.

Financial and Corporate

$130,120,197 Investment Increase

Despite This Figure, Reported in Illinois, Revenue for Paying Return Decreased in 1919 Over 1914

The accounting section of the Illinois Public Utilities Commission has recently made public the comparative consolidated statistics of the various public utilities of the State under pre-war and post-war conditions. This consolidated statement, including the telephone, electric railway, electric light, gas and water utilities, brings out some interesting things, when comparison is made between the statements for the two years under discussion.

All of the utilities with the exception of the interurban railroads show a decrease in the ratio of net operating income to the book value of the properties in 1919 as compared with 1914. The reason for this exceptional position of the interurban railways is due, according to the statement of the commission, to the fact that a number of these companies resorted to the courts and obtained injunctions against the enforcement of the law limiting passenger rates to 2 cents per mile. In the accompanying consolidated statement for all utilities it will be noted that the amount of revenue available for paying a return on the investment, actually decreased in 1919 as compared with 1914, although the amount of investment devoted to operations in 1919 was $130,120,197 larger than in 1914.

If the same rate of return had been earned on the book value of the property devoted to public service in 1919 that was earned on the book value of the property in 1914, namely, 4.77 per cent, a net operating income of $53,304,018 would have been required in 1919. This amount is $6,264,316 in excess of the $47,039,702 actually earned in 1919, and indicates that the public of Illinois has received annually the benefit of more than $6,000,000 resulting from a reduction of this amount since 1914 in the earnings of the utilities.

Whatever may be said as to inflated capitalization before the commission had jurisdiction over the securities, the $130,000,000 added to the investment from 1914 to 1919 represents actual expenditures in money under the commission's regulations. Such added investment is entitled to a fair return for its use in the public service. Assuming that this $130,000,000 should earn 6 per cent, the amount required to be earned on this added investment would be $7,800,000 per annum. Deducting this from the amount actually earned in 1919, $47,039,702, leaves applicable to the $987,382,451 book value of property in 1914 only $39,239,702 of net income. This is $7,902,855 less than the net income earned in 1914. It represents a reduction of profits to the utilities of 16.76 per cent and a corresponding saving to the public. If it be assumed that the actual new investment since 1914 should earn 7 per cent instead of 6 per cent as above, the reduction in profit of the utilities would be 19.1 per cent.

The comparative statistics for the electric railways are shown in the accompanying statement. They cover twenty-nine interurban companies, twenty-two city companies, and nine combined interurban and city lines.

CONSOLIDATED STATEMENT OF THE ILLINOIS ELECTRIC RAILWAY COMPANIES

	June 30, 1914	Dec. 31, 1919	Per Cent Increase
	Book Value		
Interurban lines	$84,057,041	$86,973,770	3.47
City lines	298,934,913	315,118,819	5.41
Interurban and city lines	50,615,298	52,072,805	2.88
	Operating Revenues		
Interurban lines	$6,540,372	$12,055,034	84.32
City lines	45,502,620	63,063,097	38.59
Interurban and city lines	4,941,557	6,302,485	27.54
	Operating Expenses		
Interurban lines	$4,330,407	$8,907,417	105.69
City lines	25,580,227	45,224,557	76.79
Interurban and city lines	3,339,073	4,919,779	47.34
	Net Operating Revenue		
Interurban lines	$2,209,965	$3,147,617	42.43
City lines	19,922,393	17,838,540	10.46
Interurban and city lines	1,602,484	1,382,706	13.71*
	Taxes		
Interurban lines	$254,309	$451,347	77.48
City lines	5,552,381	4,669,265	15.91*
Interurban and city lines	137,511	188,834	37.32
	Net Operating Income		
Interurban lines	$1,955,656	$2,696,270	38.37
City lines	14,370,012	13,169,275	8.36*
Interurban and city lines	1,464,973	1,193,872	18.51*
	Ratio Net Operating Income to Book Value		
Interurban lines	2.33 per cent	3.10 per cent	.77
City lines	4.81 per cent	4.18 per cent	.63*
Interurban and city lines	2.89 per cent	2.29 per cent	.60*

* Decrease

CONSOLIDATED STATEMENT ALL ILLINOIS UTILITIES

Item	1914	1919	Per Cent Increase
Total book value	$987,382,451	$1,117,484,648	13.18
Operating revenues	154,579,081	234,860,653	51.94
Operating expenses	95,870,774	172,253,049	79.67
Net operating revenue	$58,708,307	$62,607,604	6.64
Taxes	11,194,611	14,956,307	33.60
Uncollectible accounts	371,139	611,595	64.79
Net operating income	$47,142,557	$47,039,702	.22*
Ratio of net operating income to book value of property	4.77 per cent	4.21 per cent	.56*

* Indicates decrease.

Denver Bondholders Are Organizing

Holders of the first and refunding sinking fund mortgage twenty-five-year 5 per cent gold bonds of the Denver (Col.) City Tramway are being solicited to deposit the bonds with a committee of which B. W. Jones, 16 Wall Street, New York City, is secretary. The court recently authorized the receiver to collect an 8-cent fare for adults, with two tickets for 15 cents, but the city and county of Denver are vigorously opposing even this temporary relief, and, in spite of the fare advance the current earnings, according to the committee of security holders, continue to be unfavorable.

On Nov. 1, 1920, the company defaulted the interest on $9,888,950 of bonds of the above-mentioned issue, and also on $484,500 Denver & Northwestern Railway first and collateral mortgage bonds. It had previously defaulted the interest on $2,498,000 of 7 per cent collateral trust gold notes. On Dec. 24, 1920, a receiver of the property of the company was appointed in the United States District Court for the District of Colorado, upon a creditor's bill.

The company has also defaulted a second installment of interest due on April 1, 1921, on the 7 per cent collateral trust gold notes, and it cannot yet be determined whether the company will be able to take up the defaulted Nov. 1 coupons on the first and refunding sinking fund mortgage twenty-five-year 5 per cent gold bonds before May 1, 1921, and it may be compelled to default the coupons due on that date. The committee now seeking deposits says that in the event of default on May 1 remedies under the mortgage would be available against the company.

A protective agreement has been prepared, under which the bondholers are requested to deposit their bonds. Copies of the agreement may be obtained from the Bankers' Trust Company, New York, or from the International Trust Company, Denver, Col., or from the Industrial Trust Company, Providence, R. I.

New York Utility Legislation Completed

Prospective Earning Capacity at Contract Rate of Fare Made an Element of Value Under Governor's Urging

Governor Miller's special message to the New York Legislature, on April 13, resulted in the final passage of an amendment to the General Public Service Commissions law, which will make mandatory instead of permissive the things the commission shall do and consider in a hearing for increased fares, and which adds a clause that the Transit Commission shall also consider "the estimated prospective earning capacity of such property at the rate of fare at the time fixed and existent"—that is, the prospective earning capacity of each property at the rate of fare contracted for by the company and city.

As WAS reported in the issue of the ELECTRIC RAILWAY JOURNAL for April 16, page 748, the Governor included arguments to support the consideration of prospective earning power under a franchise or contract rate as being one element to consider in the work of making a valuation.

The Governor's special message, which outlined some of these arguments, follows in full:

> The ordinary standards of physical valuation, either original or reproduction cost less depreciation, do *not* meet the emergency with which we have to deal, and physical valuations according to any standard that could be prescribed will in most cases under existing conditions be grossly unfair to the public.
>
> It is claimed that many surface lines in New York City cannot be operated at a profit at any reasonable or practical fare, and it will doubtless be necessary to discard some lines and operate others even at a loss to provide the public the necessary service. Any plan or any rate based on the physical valuation of such lines would manifestly be unjust to the public.
>
> ### INFLATED VALUES GUARDED AGAINST
>
> Moreover, the rate of fare fixed by franchise or contract is a proper, if not an essential, element to be taken into account in the valuation of the property affected. Companies which have agreed to operate at a 5-cent fare or have accepted franchises with conditions annexed imposing a 5-cent fare, and the investors in the securities of such companies have no just claim to a valuation of their properties without regard to the average earnings which they may reasonably be expected to make in the future at such fare under the conditions which are likely to obtain. Indeed, the true rule of valuation of any property for business purposes is the capitalized value of its prospective earnings under normal conditions. Where such earnings in the case of a public utility are limited by contract or franchise they should be computed and the property affected by them valued according to such limitation. Any other basis of valuation of the traction lines in the City of New York might result in enormous gratuities to the companies at the public expense.
>
> We are dealing with a problem vitally affecting the public welfare, and for that reason alone the exercise of its police power by the state is justified. It is not a question of the rights of the companies, which are fixed by contract or franchise. The problem is to determine what is in the ultimate public interest, how credit can be provided to finance necessary extensions, and to obtain the additional facilities required to render adequate public service, and in the solution of that problem private interests must not be permitted to capitalize the public need.
>
> It is very difficult to prescribe by statute a standard or principle or valuation that will be fair and not too inflexible. I fear that in the absence of any other prescribed standard the statute as it now stands will be construed as contemplating a valuation based on physical values, which, as I have said, may prove to be grossly unfair to the public.
>
> A standard has been proposed which appears to me to be fair and sufficiently flexible to enable the commission to do exact justice while at the same time it safeguards the public interests. That is the standard which has to be employed daily in the conduct of business affairs; namely, the prospective earnings of the business to be valued. Applied to the matter in hand the valuation should be based on the estimated prospective earnings at the fare in each case which the company is permitted to charge under its franchise or contract with the city, the valuation in no case to exceed the original cost or the fair reproduction cost less depreciation of the property necessarily employed in the public service.
>
> ### INCREASED FARES OFTEN REDUCE REVENUE
>
> The fare which any company can charge will, as a practical matter, be limited by what other companies are permitted to charge, and the amount which it is reasonable for the public to pay is also a limiting factor, and it has been found that increased fares often result in a reduction of revenue. Of course, the statute should be flexible enough to permit consideration of all relevant facts and circumstances, such as, for example, the prospect of increased earnings of lines now serving undeveloped territory.
>
> The foregoing principle of valuation will, in my *opinion*, be fair to the public and to the companies alike, and, with the limitation that the valuation cannot in any case exceed the original cost or the fair reproduction cost less depreciation, it will adequately *safeguard* the public interest. Of course I construe fair reproduction cost to mean such cost under normal, *not* abnormal, conditions.
>
> There are other verbal changes needed to limit the discretion of the *commission* and to define more accurately the jurisdiction of the Transit Commission.

The Governor issued a subsequent message to the press, expanding his ideas as to what he meant by the principle of valuing the properties on the basis of prospective earnings. In this statement he said:

> The principle that I suggest is that the properties shall be valued on the basis of their earnings. Necessarily these must be prospective earnings, because that is the way you value all property under average conditions, conditions that are liable to obtain in the future, at the fare they have agreed to take.
>
> ### A CONTRACT IS A CONTRACT
>
> Here is the proposition. These contracts were made, and I think a contract is a contract. Now it is claimed that emergency conditions have existed under which an unusual situation is presented. Undoubtedly there is an emergency existing in transit in the City of New York at the present time. Nobody doubts that. Now, some just basis or principle of valuation must be hit upon if some comprehensive scheme is worked out. My principle is that these properties shall be valued at what they will earn at the stipulated fare under conditions that are likely to obtain, not under abnormal conditions.

Asked if a change in the fare for one company in New York City meant that all the railway companies would have to have the same fare, the Governor said:

> It would ordinarily appear that if a company had a fare different from that at which another company could carry passengers between the same points it would not get any passengers if its fare was less advantageous to those who travel. If the surface lines had a higher fare than the elevated or subways everybody would ride on the elevated or subway. We are going to have a commission to work that out.

In response to the Governor's urging the Legislature passed amendments to the Public Service Commission law so that the Transit Commission in New York City shall have jurisdiction and supervision over all railroads, street railroads and stage or omnibus lines or routes, and to persons or corporations owning, leasing or operating such lines which lie wholly or in part within the corporate limits of New York City. The general State Commission, however, shall have jurisdiction over construction, maintenance, terminal facilities, stations, etc., outside of New York City.

There is thus created a sort of joint jurisdiction over lines operating across the city lines. The Transit Commission also has jurisdiction over all holding corporations or persons which hold the majority of the stock of a corporation subject to the jurisdiction of the Transit Commission in respect of the relations between such corporation and the holding company or person.

The most important changes in the law, however, are that the Transit Commission is given power to regulate construction, maintenance, stationary equipment, terminal facilities, stations and local transportation facilities of street railroads, or stage or omnibus lines or routes within the City of New York, as well as to regulate operation and fares, and the provision which makes mandatory instead of permissive the things the commission shall do and consider in the hearing for increased fares, and that

> The commission shall, with due regard among other things to the estimated prospective earning capacity of such property at the rate of fare at the time fixed and existent, and to a reasonable average return upon the value of the property actually used in the public service, and to the necessity of making reservation out of the income for surplus and contingencies, determine the just and reasonable rates, fares and charges to be thereafter observed and inforced as the maximum to be charged for the service to be performed, notwithstanding that a higher or lower rate, fare or charge has been heretofore prescribed by general or special statutes, contract, grant, franchise condition, consent or other agreements,

and finally, in connection with the valuation of the property to be made,

> Such valuation shall be made with due regard to the estimated prospective earning capacity of the property necessarily used in the public service at the rate or rates of fare of the company prior to the taking effect of this act was entitled to charge, in view of the provisions of the contract or franchise under which the property is operated or held, or of any lawful order in force, fixing or regulating rates or fares and of the competition of other lines and with due regard to all other pertinent facts and conditions; but such valuation shall not in any case exceed the fair reconstruction cost of the property less depreciation. Such valuation shall be in such detail and shall include such elements of cost or values and shall be made in such manner as the commission may prescribe. Such valuation as finally determined by the commission shall be the basis for all allowances to the railroad companies under the plan and for thereafter fixing the returns on the property so valued, anything in this chapter to the contrary notwithstanding.

One other modification of interest is that in the plan of readjustment which the Transit Commission shall make, of the four purposes which were originally included, the following is now eliminated:

> The readjustment of the existing rights and obligations of the railroad companies so that the real values in the railroads may be protected and securities stabilized.

Poor Showing Up State

New York State Railways and Schenectady Railway Fail to Earn Sufficient to Pay a Return

For the year 1920 the New York State Railways reports earnings of but $1.75 per share of stock outstanding as against $1.43 the previous year. On Aug. 1 a service-at-cost contract became effective with the city of Rochester for a term of ten years. This contract provides for an annual return, ranging from 6 to 8 per cent upon the base value of the property used in serving the Rochester city lines, tentatively appraised at $17,500,000.

In Schenectady net income decreased 28.2 per cent, leaving but $32,851 with which to pay dividends on $4,100,000 of outstanding stock. The accompanying table shows the results of operation for the last two years for both the New York State Railways and the Schenectady Railway.

INCOME ACCOUNT — NEW YORK STATE RAILWAYS AND SCHENECTADY RAILWAY

	New York State Railways			Schenectady Railway		
Item	1920	1919	Per Cent Change	1920	1919	Per Cent Change
Railway operating revenues	$10,454,410	$9,406,473	11.1	$1,905,313	$1,664,282	14.5
Operating expenses (a)	8,369,558	7,134,491	17.3	1,629,966	1,380,325	18.1
Net revenue railway operations	$2,084,852	$2,271,982	—8.3	$275,346	$283,957	—3.0
Net revenue auxiliary operations	2,631	562	567.5	....	....	.....
Net operating revenue	$2,087,483	$2,271,420	—8.1	$275,346	$283,957	—3.0
Taxes	621,173	602,869	3.0	94,072	90,683	3.7
Operating income	$1,466,310	$1,668,550	-12.1	$181,274	$193,274	—6.2
Non-operating income	300,041	37,473	700.3	1,512	3,913	—61.4
Gross income	$1,766,351	$1,706,023	3.5	$182,786	$197,187	—7.3
Deductions	1,336,671	1,361,816	—1.8	149,935	151,484	—1.0
Net income	$429,680	$344,207	24.8	$32,851	$45,703	—28.2
Sinking fund appropriations	32,633	31,641	3.1	....	....	.....
Surplus	$397,047	$312,566	27.0	....	....	.....
Undivided earnings of other companies	21,075	27,699	—23.8	....	....	.....
Total for dividends	$418,122	$340,265	22.8	$32,851	$45,703	—28.2

( ) Including depreciation and deferred maintenance accrual.

Memphis Doing Better Than Was Anticipated

Commissioner Horace Johnson has pointed out that while the deficit reported by the receivers of the Memphis (Tenn.) Street Railway for the month of February is several thousand dollars in excess of the January deficit, it is $15,290 below the deficit in the estimate prepared by Ross Harris, consulting expert, covering each month for the year 1921. The January deficit was $4,941 below the estimate of Mr. Harris.

Figuring on the basis of operations for previous years and using the other data at his command, Mr. Harris prepared a table for each month of 1921 in which he set out his estimates of items of expense included in cost of service. The report also gives the estimated revenue for each month, the number of revenue passengers and the number of car-miles. By means of his estimates of the total cost of service and the total revenue for each month he arrives at the estimated deficit or surplus for that month. Thus far the company has exceeded Mr. Harris' expectations.

In January, for instance, the estimated deficit was $15,364, while the actual deficit was $10,423. In February, instead of the deficit of $32,560 anticipated by Mr. Harris, the actual deficit for the month was $17,290. Mr. Harris anticipates a surplus for April amounting to $3,350 and for May amounting to $9,147. Deficits of $146 and $1,483 respectively are anticipated for June and July. The figures in Mr. Harris' table would result in the estimated deficits and surpluses for the individual months cancelling each other by the end of the year, thus leaving untouched, however, the deficit of $129,564 with which the receivers entered upon the year 1921.

The deficit at present is in the neighborhood of $157,000. This includes the total deficit of more than $129,500 for the year 1920, together with the January deficit of more than $10,000 and that of February in excess of $17,000. In the event the operations during March, April and May do not come up to expectations and the deficit continues to grow instead of taking a downward trend, the receivers may seek an 8-cent fare.

City Urges Consolidation

The brief filed by Corporation Counsel Geraghty of Spokane, Wash., with the State Public Service Commission in the action of the city to prevent the granting of the 8-cent fare to the Washington Water Power and the Spokane & Eastern Railway & Power Company, says:

> These conditions compel us to the inevitable conclusion that the only solution for the situation, so far as the Spokane & Eastern company lines are concerned, lies in consolidation.
>
> There is no question of confiscation involved here, because this is not a case where the city or the state has attempted by legislation to fix a rate of fare to be charged by the Traction company. It is a case where the company and the city made a contract which at this time has proved unprofitable to one of the parties. Courts and commissions do not, as a matter of law, relieve competent contracting parties from improvident contracts.
>
> Some fanciful difficulties in the way of a consolidation were suggested by the representatives of the two companies at the hearing, but we have no hesitation in saying that if the companies desire in good faith to consolidate the lines no legal impediment will be found growing out of the city's laws. The responsibility for the failure to effect a consolidation must rest upon the companies themselves.

Toledo Traffic Decreases

The net result of March operations of the Community Traction Company, at Toledo, Ohio, under the service-at-cost ordinance, shows a deficit of $73,756, according to the April 11 report made by Commissioner Wilfred E. Cann.

While net earnings from operation show a surplus of $18,854, as compared with $9,998 for February, the daily revenue due to the poor industrial conditions is less by $470 and operating expenses are also $280 less. Fixed charges increased to $92,610 through the raising of the amount paid into the depreciation and maintenance funds and the establishment of an injuries and damages fund.

There is a balance in all of these funds at the end of March of $37,362, which may be deducted from the net deficit in order to compare with the previous month.

The stabilizing fund is now at a level of $313,333, it having developed that only payments for interest on bonds and dividends on preferred stock may be drawn from that fund when revenues do not equal expenses and fixed charges.

Mr. Cann believes that with the elimination of the bus competition on April 21, the rerouting of the Huron-Erie line, the adjustment of wages and new speed schedules savings will accrue which will wipe out the deficit before a fare raise is necessary.

A tentative agreement has been reached with the interurban lines whereby they are to pay a rental of 40 cents a carmile for the use of the city tracks, the overhead and power. This is a 41 per cent increase over what they are now paying on a percentage of gross receipts basis. Under the new contracts revenues, it is estimated, will be increased about $80,000 a year.

During the month 5,710,010 revenue passengers were carried at a deficit of 1.29 cents each. Car-mile operating expenses totaled 41.56 cents against 42.86 during February. Revenue from operation was 42.4 as against 46.5 cents per car mile the previous month. Total for the month was 8.64, compared to 8.98 in the month of February, showing a decrease in traffic of 3.94 per cent.

$400,000 Shrinkage in Louisville in Amount Available for Dividends

The accompanying income statement taken from the annual report of the Louisville (Ky.) Railway shows operations for the year ended Dec. 31, 1920. As operations during the preceding year were much affected by a strike of trainmen, comparative income figures are also shown for 1918, as well as 1919, to give a means of judging the condition of the company as compared with a year more nearly normal than was 1919.

INCOME STATEMENT—LOUISVILLE RAILWAY

	1920	1919	1918
Revenue from transportation	$3,962,206	$3,371,567	$3,556,031
Other operating revenues	184,301	165,667	151,658
Total operating revenues	$4,146,507	$3,537,234	$3,707,689
Operating expenses	3,229,187	2,794,439	2,383,972
Net revenue from operations	$917,320	$742,795	$1,323,717
Taxes	366,000	366,000	355,369
Operating income	$551,320	$376,795	$968,348
Non-operating income—			
Lou. & Int. R.R. net income	124,256	$100,000	$84,657
Other non-operating income	2,675	5,297	3,758
Total non-operating income	$126,931	$105,297	$88,415
Gross income	$678,251	$482,092	$1,056,763
Deductions from gross income—			
Interest on bonds and notes	$632,790	$630,920	$627,000
Amortization of discount on notes	9,207	8,677	5,055
Total deductions	$641,998	$639,597	$632,055
Balance available for dividends on stock	$36,253	*$157,505	$424,708

*Defici..

The report also contains a historical sketch of developments leading up to the recent increase in fare from 5 cents to 7 cents as well as the valuation of the property by J. G. White Company details of which have already been printed in these columns from time to time.

Knoxville Valuation Figures Expected Soon

A decision of the Tennessee Public Utilities Commission relative to the appraised value of the property of the Knoxville Railway & Light Company is expected within the next few days.

The appraisal made by Albert S. Richey, representative of the commission, and J. H. Perkins, representative of the company, was submitted to the commission for its consideration on Dec. 19, 1920. A combination of circumstances has caused a delay in the final outcome. The election came on in Tennessee. The Legislature met and has just adjourned. These took the time of the members and then Mr. Campbell took his seat on the board after the first hearing on the subject of the appraisal and he desired to go over the records thoroughly before casting his vote.

After the commission has made its decision on the value of the property of the traction company, together with its commercial lighting plant, another decision will follow as to whether the company is entitled to a 7-cent fare and 2 cents additional for transfers for which it has petitioned.

The two engineers who signed the report found that the historical value of the plant was $6,234,141 and that the reproduction cost would be $10,362,964. William H. Weiss, the engineer representing the city of Knoxville, refused to sign the majority report, but made a separate report, finding, in his opinion, that the appraisal of the other two engineers was approximately $2,000,000 too high.

Financial News Notes

St. Petersburg Road Doing Well.—The St. Petersburg (Fla) Municipal Railway showed a profit of $10,000 for the month of March, according to Director of Public Utilities R. E. Ludwig. He states the lines will more than earn interest and sinking fund charges this year after taking care of operating expenses and many additions and improvements—including several new one-man cars which have been bought.

Too Soon to Draw Conclusions.—J. P. Barnes, president of the Louisville (Ky.) Railway, is disappointed but not discouraged over the results with the 7-cent fare put into effect there recently. The new fare has hardly been in force long enough to justify the drawing of a general conclusion, but the expected increase of 20 per cent in revenue under the new rate has proved actually to be not more than 10 per cent.

Guaranteed Dividend Being Paid.—Frank Hedley, president of the Interborough Rapid Transit Company, New York, N. Y., on April 14 authorized the following statement: "The dividend due on April 1 to holders of Manhattan Railway stock under the terms of the lease to the Interborough Rapid Transit Company, will be paid in groups, commencing April 15, and payments will continue in accordance with the financial ability of the company. It is anticipated that the entire dividend will be paid within the present month."

Trenton Road Valued at $5,000,000.—The value of the property and business in the service of the public of the Trenton & Mercer County Traction Corporation, Trenton, N. J., has been determined by Ford, Bacon & Davis, engineers, New York, as being $5,000.000. The methods pursued in the valuation were the same as used in the Public Service Railway valuation. The reproduction cost new of the property as a going concern based on Sept. 1, 1920, prices for labor and material is estimated to be $9,391,228. The historical cost built up from the companies, records show a value of $5,335,674.

Foreclosure Sale Set for April 30.—Paul E. Thomas, special master, will offer for sale at Meadville, Pa., on April 30 $300,000 of capital stock of the Meadville, Conneaut Lake & Linesville Street Railway $350,000 capital stock of the Crawford & Erie Railroad, and $145,000 of capital stock of the Peoples Incandescent Light Company, all pledged under the indenture securing the first 5 per cent bonds of the Northwestern Pennsylvania Railway, Meadville, Pa., dated 1911. The securities are to be sold under foreclosure proceedings with a view to consummating the reorganization plans for the properties outlined some time ago.

Assets $1,139,884 Less than Claims.—Robert W. Perkins, receiver of the Shore Line Electric Railway, Norwich, Conn., has filed with the clerk of the Superior Court his appraisal of the property as of Feb. 1, 1921, and a report of operations for fifteen months of the receivership. Portions of the road have been sold and dismantled. The appraisal of road and equipment is $2,451,965. The receiver's report shows that on the entire system there was an operating deficit of $52,227 for fifteen months up to Dec. 31, 1920, to which January of this year added an operating deficit of $3,749 and February of $6,112, making a total to March 1 of $62,089. The difference between tangible assets and preferred claims is $1,139,884.

Distribution Provided in Reorganization.—The Western Pacific Railroad on April 11 was authorized by the California Railroad Commission to issue and sell at 85 and accrued interest $4,180,000 of its first mortgage 5 per cent bonds. The bonds will be acquired by the Western Pacific Railroad Corporation and then distributed to bondholders of Sacramento Northern Railroad who have agreed to sell their bonds to the Western Pacific. The Western Pacific has offered to pay $27.50 a share for the first preferred stock, $15 a share for the second preferred and $6 a share for the common. It has also offered to exchange for the bonds of the Sacramento Northern first mortgage bonds of the Western Pacific on the basis of $80 face value of the Western Pacific bonds for $100 face value of Sacramento Northern bonds.

Traffic and Transportation

Six Cents in Indianapolis

Basic Five-Cent Fare Preserved Under Ticket Ruling—One Cent for Transfer

A cash fare of 6 cents, twenty tickets for $1 and 1 cent for a transfer were authorized by the Public Service Commission of Indiana on April 15 in passing on the petition of the Indianapolis Street Railway for higher fare and more revenue. Under the order those who buy tickets will pay the same fare as they have been paying recently. The 1-cent charge for a transfer was continued by the commission's denying the company's petition for a 2-cent transfer charge. The company's request for a 6-cent cash fare and twenty tickets for $1 is granted. The commission feels that under the order 5 cents is preserved as the basic fare. The order took effect at 12.01 o'clock a.m. on April 18.

John W. McCardle, a member of the commission, dissented in a brief statement as follows:

> I must dissent from the relief granted for the reason that I do not believe it will provide the revenue that is necessary.

Commissioners Lewis, Van Auken, Barnard and Johnson concurred in the order.

The order is temporary. It says:

> That the commission continue consideration of the prayer of petitioner for an extra 1-cent transfer charge, pending a period of thirty days, in which there shall be determined the effect, in percentages, of patrons paying cash fares and traveling on tickets, of the fares hereinbefore authorized, but the commission reserves the right to pass on the matter of the prayer for an additional charge of 1 cent for transfers at any time if it should be conclusively shown that the percentage of patrons paying cash fares is so small as to nullify the relief which the commission herein seeks to provide.

The order also directs that within the next month

> The Indianapolis Street Railway and the interurban railroads, which are parties to this order, bring before the commission for final conclusion all matters pertaining to the carrying out of plans filed with the commission in conformity with its order of Dec. 18, 1920, for the remedying of inadequacy of interurban freight terminals in the city of Indianapolis, to the end that said matters may be brought to an early conclusion.

The local company, which has provided freight terminal facilities, recently made an agreement with the interurban companies by which the latter are to take over and develop the Kentucky Avenue freight terminal site. The agreement, before becoming effective, must be approved by the Public Service Commission, and this matter is to come before the commission soon.

Ferdinand Winter, attorney for the company, declared recently in a reply brief filed with the commission:

> The railway does not claim that there is anything in any order of the commission that obligates the commission to provide rates of fare that will enable it to pay dividends upon its preferred stock. It does claim, however, that the public has no right to the use of its property except by the payment of rates which will afford a reasonable return upon the value of such property, and that, as the commercial rate of interest ranges from 7 to 8 per cent such reasonable return should be at least 7 per cent, after payment of all operating expenses, including the sum set apart by the commission for maintenance and repairs and all taxes.

The brief continued by pointing out that the company understood the commission had set 7 per cent as a fair return, but that the company was asking for much less than this amount.. It pointed out that the value of the property as fixed by the State tax board was $16,500,000 and that the value of the property as tentatively fixed by the commission, including recent improvements and additions, was approximately $16,000,000. It also showed that 7 per cent of this sum was $1,120,000 and that the proposed net earnings of the company would be only $891,237. This would be further reduced by $52,796, representing the difference between an overestimate of estimates of receipts from cash fares and an underestimate of expected receipts from transfers.

Eight-Cent Fare in Syracuse

The New York State Railways, is authorized to charge an 8-cent cash fare, with four tickets for 29 cents, on its Syracuse lines under a decision handed down by the Public Service Commission for the Second District of New York on April 19. The new rate is authorized to go into effect on three days' notice.

Determination of the commission was announced following a long executive session in which a report of Commissioner Joseph A. Kellogg, who heard the case, was discussed at length.

The company asked for a 10-cent fare. It has been charging 6 cents.

Opposing the application, Corporation Counsel E. H. Lewis argued that a 7-cent fare, with four tickets for 25 cents, would be adequate.

The increased fare is granted for a period of six months and will continue thereafter until a further order of the commission.

The valuation fixed by the commission on the property was $8,922,728. The company claimed a valuation of $21,500,000. The city put in figures, prepared by Milo R. Maltbie, expert, showing a valuation of $5,121,453.

The Mayor's commission, which recommended a service at cost agreement, placed the valuation at $12,415,000.

The fare for children may be increased from 3 to 4 cents, the commission decided.

No other changes in the charter, newspaper rate, or other rules and regulations is permitted under the order.

Preferential Fares Raised

I. C. C. Over-rules Intrastate Franchise Fare on Ohio Lines of Wheeling Traction Company

Certain intrastate fares of the Wheeling (W. Va.) Traction Company were found to be preferential to intrastate passengers while prejudicial to interstate passengers in a decision handed down by the Interstate Commerce Commission in the case of Beall vs. Wheeling Traction Company. Discriminations arose because interstate passenger fares were higher than the fares between points within the State of Ohio. The intrastate fares in certain Ohio cities where the road operates were inadequate and could not be raised because of franchise requirements.

There were two complaints brought by citizens of Wheeling and Wellsburg, W. Va., the circumstances of which were so nearly identical that they were consolidated and disposed of in one report by the commission. To cite one case will be sufficient.

Wheeling, W. Va., and Bridgeport, Ohio, on opposite sides of the Ohio River, are connected by bridges. The distance from Wheeling to Bridgeport, Ohio, is 1.5 miles, to Martin's Ferry, Ohio, 5.72 miles, and to Bellaire, Ohio, 8.16 miles. The intrastate fare between Martin's Ferry and Bellaire, a distance of 8.94 miles, is 5 cents. The interstate fares from Wheeling to Bellaire, 8.16 miles, and from Wheeling to Martin's Ferry, 5.72 miles, at the date of hearing were each 10 cents. Subsequently they were increased to a cash fare of 12 cents and a ticket fare of 10 cents between Martin's Ferry and Wheeling and a cash fare of 16 cents and a ticket fare of 13⅓ cents between Bellaire and Wheeling. The transportation conditions under which the three movements are made are similar. The entire intrastate journey is made upon cars operated in interstate commerce since no through cars are operated between Bellaire and Martin's Ferry and intrastate passengers are required to transfer at Bridgeport from and to cars operated in interstate commerce.

Under the terms of the franchise granted it by the city of Martin's Ferry, the traction company may not charge more than 5 cents between Martin's Ferry and Bellaire, a distance of 8.94 miles. The Public Utilities Commission of Ohio permits the company to charge 10 cents between Bellaire and Bridgeport, a distance of 5.7 miles, the passenger in the latter journey traveling over the same rails in the same car as the Bellaire-Martin's Ferry passenger. A passenger boarding a car at Bellaire who states his destination as Martin's Ferry pays but 5 cents and is given a transfer to be used at Bridgeport. One who states his destination as Bridgeport, 3 miles less distant than to Martin's Ferry and over the same rails, must pay 10 cents. The practical result is that the traction company cannot make use of the authority granted it by the Public Utilities Commission of Ohio to charge 10 cents from Bellaire to Bridgeport because passengers to the latter point invariably escape the higher fare by stating their destination as Martin's Ferry. The same situation prevails with respect to travel from Martin's Ferry to Bellaire.

The commission regarded the interstate fares as reasonable and the intrastate fare of 5 cents between Martin's Ferry and Bellaire unduly low and ordered the Wheeling Traction Company to "desist from practicing the undue prejudice, preference and advantage and unjust discrimination." For this intrastate line the commission set the rate of fare at 16 cents cash or 13⅓ cents when tickets are purchased.

John E. Benton, General Solicitor for the National Association of Railway & Utility Commissioners, announced on April 14 that the association looked upon the decision at Wheeling as assumption by the Interstate Commerce Commission of jurisdiction enabling it to prescribe intrastate rates for the purpose of increasing the revenues of city railways. He said the decision would be contested. Mr. Benton is quoted as follows:

> The possible far reaching effect of the decision in offering opportunity to street railway carriers of that charter to secure revision of rates now limited by franchises, even though their lines be wholly intrastate, is evident.
>
> The possible consequences of this decision, if adhered to, and sustained by the courts, are obvious even without suggestion. Inasmuch as every street railway that connects with another which is interstate can easily become an interstate carrier, it may be said to rest with such carriers, of the class described in this case, to bring themselves under the jurisdiction of the Federal commission whenever they desire to do so.
>
> If the order of the commission in the Wheeling Traction Company case stands, it is evident that as to a large part of existing street railway lines, final power of rate regulation has passed from the states to the Federal commission.
>
> If the commission has jurisdiction to declare intrastate interurban fares discriminatory on the ground that it injures an interstate carrier to lose money—and hence interstate commerce—it would seem certain that it hurts just as much to lose it in the city as in the country.
>
> If may be regarded as certain that street railroads which come within the rule as finally laid down will speedily create situations which will call for the extension to their full limits of the principles involved in the decisions made accordingly, if the Wheeling decision stands, busy days would seem to be ahead for the Federal commission.

Jitney Ordinance Upheld

A court order of April 12 at Davenport, Ia., continued in force a temporary injunction under which operation of jitney buses on the public streets is prohibited. The court held that a "jitney bus is an automobile competing with a street railway company for business on the public streets." The jitney men's attorneys sought to prove that their clients were not jitney bus drivers but taxi cab proprietors and as such had the same right as any taxi-cab to operation on the streets. This decision forces the bus men to take out bonds and in other ways conform to the jitney bus ordinance now on the city's books.

Iowa Rate Cases Decided

U. S. Supreme Court Declares Confiscatory Rate in Ordinance Cannot Be Enforced

When the Supreme Court of the United States handed down its opinion on April 11 on the rate case of the San Antonio Public Service Company it rendered also an opinion in three cases of lighting rates in Iowa. The San Antonio decision, as abstracted in this paper for last week, upheld the position of the railway because the court held that the city did not have power to establish a rate of 5 cents. The Iowa cases were decided in favor of the utilities upon very similar grounds. In passing upon them the court said that the statute forbade the cities from making contracts regarding rates.

The cases were Southern Iowa Electric Company vs. City of Chariton; Iowa Electric Company vs. City of Fairfield, and Muscatine Lighting Company vs. City of Muscatine.

In its decision in the lighting rate cases the Supreme Court says:

> Two proposition are indisputable: (a) That although the governmental agencies having authority to deal with the subject may fix and enforce reasonable rates to be paid public utility corporations for the services by them rendered, that power does not include the right to fix rates that are so low as to be confiscatory of the property of such companies. . . . and (b) that where, however, the public service corporations and the governmental agencies dealing with them have power to contract as to rates and exert that power by fixing by contract rates to govern during a particular time the enforcement of such rates is controlled by the obligation resulting from the contract, and therefore the question of whether such rates are confiscatory becomes immaterial.

In the three cases in question the court held that a contract did not exist in the case of the Iowa cities, and it quoted comments on this subject by the Supreme Court of Iowa. A portion of this quotation follows:

> There was a time in the history of our legislation when the right of contract as to rates was conferred by statute upon the city councils. . . . By the revision and codification of 1897 the right of contract as to rates for utilities of this character was entirely eliminated, and the legislative power to regulate rates was conferred upon the city council in all cases. The reason for the change of method is obvious enough. Under the contract method the rights of the public were often bartered away, either ignorantly or corruptly, and utility corporations became empowered through the contractural obligations to enforce extortionate rates. The net result of the progressive legislation is found in our present section 725 whereby it is forbidden to any existing city council to bind the city to any rate for any future time. The power of regulating the rate is always in the present city council. It must be said, therefore, that the rates fixed by section 6 of the ordinance hereinbefore referred to were not fixed by contract.

In another case the Supreme Court of Iowa says, in referring to section 725 of the Code of 1897:

> That statute in positive terms forbids any abridgement of the right to regulate and fix charges of service corporations named in the statute, either by ordinance, resolution or contract. No one would now contend, in the teeth of the statute prohibition, that there can be a valid contract fixing permanent rates. As to corporations named in that statute, we have held repeatedly that there can be no contracting that rates fixed for service cannot be changed.

In commenting on this situation the Supreme Court of the United States says:

> The total want of power of the municipalities herein questioned to contract for rates which are thus established and the state public policy upon which the prohibtion against the existence of such authority rests, absolutely excludes the existence of the right to enforce, as the result of the obligation of a contract, the concededly confiscatory rates which are involved, and therefore conclusively demonstrate the error committed below in enforcing such rates upon the theory of the existence of a contract.

Spokane Fare Case Concluded

The Washington State Public Service Commission has heard the applications of the Washington Water Power Company and the Spokane Traction Company for permission to increase fares in Spokane from 6 cents to 8 cents. Statistics and estimates submitted by the companies included:

> Washington Water Power Company—Earnings for 1920, $1,082,760. Estimated earnings for 1921 (with 8-cent fare), $1,364,480. Increase, $281,720. Annual depreciation or replacement reserve, $174,600. Appraisal of property and working capital, $4,966,687. Eight-cent fare will yield 8.5 per cent. Present 6-cent fare yield, 2.82 per cent.
>
> Traction Company—Appraisal, property and working capital, $2,059,569. Eight-cent fare will earn (estimated), $606,177. Net income for the company (estimated), $60,863. Yield, 3 per cent.

Outstanding features of the hearing, in nutshell form, were:

Attorney Post for Washington Water Power Company requested that permission be granted to amend its complaint and ask for a 10-cent fare in the event that the city releases jitneys.

The city revived its suggestion for a merger of the two railway systems as the only solution of the fare problem.

The Public Service Commission engineer estimated a loss of 5 per cent in travel if the 8-cent fare is adopted. The Washington Water Power Company placed its estimate of loss in travel at 8 per cent. The commission's engineer valued the lines of water power company at $400,000 more than was claimed by the company.

If an 8-cent fare is granted the Washington Water Power Company will add $26,000 a year to the payroll of its trainmen by shortening the working day. It will also increase its charge for power for the railway from $90,000 to $180,000 a year.

Strike Emergency Over, Jitneys Must Go

Supreme Court Justice Hinman at Albany N. Y., on April 15 granted a request made by Harry B. Weatherwax, as a citizen and resident, that Mayor Watt clear the streets of the motor buses and jitneys which have carried the bulk of traffic in Albany and its suburbs since the trainmen of the United Traction Company struck on Jan. 29. The Court issued a writ of mandamus to compel the Mayor, through the police, to enforce the provisions of the transportation corporation law, which prohibits a bus line from operating without its owner first obtaining a permit from the city and a certificate of necessity from the Public Service Commission. Mr. Weatherwax is vice president and general manager of the United Traction Company.

Injunction Prevents Fare Increase in Cincinnati

The possibility of another "half-cent" increase in fare by the Cincinnati (Ohio) Traction Company on May 1 was defeated temporarily during the week ended April 16, when Judge Stanley Struble granted an injunction enjoining the company from taking such action. In the suit filed by City Solicitor Saul Zielonka and William J. Kuertz, assistant city solicitor, it was said that the company had reported a deficit in its operations for February and March. William C. Culkins, Street Railway Director, investigated the reported deficit and found that there was no real deficit, but that the methods which the company employed in keeping its books were responsible for the unfavorable report for February and March. A similar injunction was issued by Judge Stanley Matthews two months ago, after a suit had been filed by the city solicitor setting forth the same claims. It was only a temporary injunction as was the one issued last week.

Zoning Plan Continued in Westchester

An order holding that it is "unreasonable" to require the Westchester Electric Railroad, the New York, Westchester & Connecticut Traction Company and the Yonkers Railroad to transport passengers between points in different municipalities for a single 5-cent fare was issued on April 8 by the Public Service Commission, Second District.

The order permits the three lines to continue to collect fares on the basis of the present zoning system for the transportation of all passengers in Westchester County.

Franchise fare restrictions were waived in April, 1919, for two years and these waivers are about to expire. They permitted collection of fares by zones, generally each municipality constituting a zone.

The order of April 8 continuing the zoning system was granted on the application of the operating companies.

Re-Routing Considered in Milwaukee

Plans for re-routing a number of the city lines of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., passing through the down-town district of Milwaukee were discussed at a hearing held by the Wisconsin Railroad Commission in Milwaukee on March 22. At the conclusion of the hearing, the company was given until April 1 to analyze the different re-routing schemes suggested and to formulate a plan of its own. The commission will hold another hearing about April 15.

The hearing was held as a result of a recent decision of the commission ordering the joint use of tracks on Wells Street by the Milwaukee Northern Railway, the Chicago, North Shore & Milwaukee and the Milwaukee Electric Railway & Light Company.

Ten-Cent Case Presented

Hearing Well Under Way on Appeal of Public Service Railway for Increased Rate

Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., said on April 11 that his company had no objection to the valuation by Ford, Bacon & Davis, just made public, being included in the pending fare case although the officers of the company felt that the figures of increased expenditure by the company were sufficient in themselves to justify the 10-cent fare. The hearing on the appeal of the company for increased rate had then been under way for about a week. Mr. McCarter also agreed to a further suspension of the proposed 10-cent rate until July 15.

For the commission, Mr. Osborne, who sat in place of President Treacy, said that the commission felt it was only fair to all parties concerned to express its views now in order that the least time possible might be lost. If the valuation was to be considered at all—now or at a later date—it might better be included in the present proceedings and the whole thing disposed of for all time. The commission wanted to settle the matter. If the question of valuation was to come up later, the time taken in the present proceeding was being wasted.

At a previous session of the present hearing Mr. McCarter startled his auditors by saying that the company had not come before the board before for relief because the commission did not want the company to ask for higher fares. He was referring to the commission which the present board has succeeded. He is reported to have said:

> We heard that the board did not want to hear any more applications for increases in 1920. However, we made the application in December because we decided we needed the higher fare, whether or not the board wanted to pass on the matter.

Mr. McCarter regarded it as an amazing spectacle to see Mr. Record, counsel for the municipalities which are opposing the increased fare, criticizing him for not asking for an increased rate.

Another witness for the company has been Richard E. Danforth, vice-president in charge of the railway. The tenor of his argument was that the 10-cent fare was reasonable and all that the traffic would bear. It took no greater proportion of the worker's income now than a 5-cent fare took in 1916. Mr. Danforth admitted that the public used jitneys because they liked automobiles, desired speed and disliked the railway corporation. He was unwilling to admit, however, that the growth of the jitney business was a consequence of the failure of the railway adequately to meet transportation needs.

The hearing will be resumed on April 22 with the presentation of testimony in the interests of the municipalities.

Eight Cents in Poughkeepsie

The Public Service Commission for the Second District, has granted permission to the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., to charge an 8-cent fare. Commissioner Kellogg, in a memorandum accompanying the order, said:

> It would seem that in a city located as is Poughkeepsie, where walking is under ordinary conditions permissible an increase in fare of such a substantial nature, especially one that arouses the antagonism of the people, would result in a very substantial falling off in the number of passengers carried. It is not probable that the slight increase authorized will diminish the fare paying passengers to any appreciable extent.

Mr. Kellogg said further that the company had never made a fair return on its investment. In the event that downward prices would affect and reduce operating expenses it is hoped that the company will promptly reduce the fare to a proper level. The old fare was 7 cents. When the company petitioned for a 10-cent fare the public protested against the proposed increase by organizing walking clubs with the slogan "We Walk."

Bamberger Electric Petition Denied

The Public Utilities Commission of Utah has refused to grant increases in passenger fares asked for by the Bamberger Electric Railroad, except that 1,000-mile mileage books may be increased from 2 to 2¼ cents a mile, and that the increase of one-tenth of a cent may be permitted to students' rates.

The rate on the 500-mile book remains at 2 cents a mile. Unlike the 1,000-mile book, the 500-mile book is not interchangeable with other lines. The new student rate is 1.1 cent a mile, but observance of the 5-cent minimum is required in all cases where the per mile fare amounts to less than 5 cents.

The 2¼-cent rate will not materially increase the revenue of the Bamberger line, the commission notes, but will materially simplify auditing as between the company and connecting lines, and for that reason this request was granted.

The company had asked for increases all along the line in its passenger fares, as well as certain increases in its freight tariffs. The latter were disposed of Dec. 31 last, when certain increases were permitted.

On the policy under which increases may be allowed, the commission makes this comment:

> The commission is of the opinion that the assumption is fundamentally wrong that the assumption that this petitioner should be granted the same scale of passenger fares in effect on connecting electric lines, in order to establish and maintain a parity of rates, in that it leaves out of consideration the important element of the cost of service. This petitioner's line connects the two largest cities of the state and traverses a territory with relatively dense population. Moreover, there is considerable interline traffic, and this petitioner, being the middle, or connecting link in the chain of electric roads that reaches from Payson, Utah, to Preston, Idaho, tapping and serving the rich central valleys of Utah, necessarily profits by its advantageous location, because the other lines act as feeders and supply it with

> both freight and passenger traffic. The volume of traffic is, therefore, much heavier than is enjoyed by either of the connecting lines.

The above comment explains the commission's attitude that the mere fact that other electric railroads in Utah have been permitted increased passenger rates does not of itself justify the granting of an increase to the Bamberger Electric.

Jitneys Under State Control in Connecticut

Jitney control in Connecticut is now in the hands of the Public Utilities Commission. Although the new jitney regulation bill became effective on April 15 when the signature of Governor Everett J. Lake was affixed, there is a provision which states that no certificate shall be valid until ninety days after the act becomes a law. This will be July 15. It will then be mandatory for all persons or corporations operating automobiles as jitneys to apply to the Public Utilities Commission for a certificate and satisfy the requirements of the law.

Jitneys are defined in the bill as any autos carrying passengers for hire, operating over regular routes or in any manner resembling the service rendered by electric railways. Rules governing fees, routes and continuity of service that apply to all common carriers must be observed by the jitneys.

Applicants for certificates must first show the public necessity for such service over the route proposed, must outline the route in detail and state the character of service proposed. It is provided that hearings by the Public Utilities Commission will be held in the town where the applicant resides or proposes to render service and states that the mayor, selectmen or chief officials of such a town shall be notified to attend the hearing.

To Connecticut's motor vehicle commissioner will fall the duty of licensing and registering drivers of jitneys. Violation of any of the terms of the act will be punishable by a fine of not more than $100 or a jail sentence of not more than sixty days, or both.

Power to make future rules and regulations regarding the operation of jitneys within the State is vested in the Public Utilities Commission.

Wants Higher Fare.—J. J. Coleman, general manager of the Scranton (Pa.) Railway, recently appeared before the City Council at the request of the latter to explain why much-needed improvements to the system have not been made. Mr. Coleman pleaded for a higher fare claiming that extensive improvements could not be undertaken without money and the issuing of securities appeared out of the question. Last year the railway lost $47,340. By figuring in the company's estimated maintenance expense of $200,000 for this year the total expenditures, including the improvements, would run to $650,122.

New Orleans Railway Cites San Antonio Case

Judge Rufus E. Foster, of the Federal District Court at New Orleans, La., upon whose decision Receiver O'Keefe, of the New Orleans Railway & Light Company, was to accept or reject the ordinance adopted by the Commission Council on April 11 cutting fare from 8 cents to 7½ cents, has rejected the action of the Commission Council and has refused to approve the reduction.

Under instructions from Judge Foster, Receiver O'Keefe applied to the court for an injunction. The case was set for hearing on April 18. The proposed fare reduction was to have become effective on April 22.

The receiver alleged in his petition, which followed his refusal to accept the new rate of fare named in the ordinance, that the fare of 8 cents fixed by the Commission Council was confiscatory since it enabled the company to collect only 2 per cent per annum on the property, said by him to be worth $29,000,000, and that the Federal Court alone could determine whether or not an 8-cent fare was required to operate the railway system.

In asking permission of the Federal Court to reject the requirements of the ordinance reducing the fare from 8 cents to 7½ cents the receiver referred to the recent decision of the U. S. Supreme Court in the San Antonio suit, wherein the city was enjoined from enforcing a 5-cent fare with universal transfers. Following the lead of the company at San Antonio Receiver O'Keefe alleged that the 5-cent fare established on the New Orleans lines was a regulatory rate and not contractual.

Youngstown Jitneys Curbed

Jitneys at Youngstown, Ohio, are to be regulated. This is made so by a decision of the Court of Appeals for the Seventh Judicial District of Ohio that a regulatory ordinance passed Feb. 25, 1920, is constitutional, excepting for a few minor requirements.

The city was enjoined from enforcing the ordinance soon after its enactment, a group of jitney drivers attacking provisions requiring bonds, license fees, citizenship of drivers and the like. Their contentions were upheld in part by the Court of Common Pleas and the case was taken to the Court of Appeals. The decision of that body has now permitted the city to enforce the regulatory ordinance.

The ordinance requires that all operators of jitneys be American citizens, that each owner must provide a $5,000 bond for liability for personal injuries and a like bond for damage to property; that each owner must pay an annual license fee of $10 and each driver a license fee of $5. Each bus must be lighted in the interior and none is to carry passengers on the running boards or more than two in excess of the seating capacity. All owners or drivers must be more than twenty-one years old. Penalties for violation are a fine of not more than $100 or six months imprisonment for each offense. In the discretion of the court, any license may be forfeited upon a third offense.

The ordinance originally provided that every owner or driver must have been a resident of the city for at least six months; that every bus must give at least sixteen hours' continuous service and that it must operate over designated routes only. These provisions were declared unreasonable and invalid by the Court of Appeals.

Dallas Asked to Play Fair

The application of the Dallas (Tex.) Railway for authority to increase fares in Dallas from 6 cents to 7 cents is still under investigation by the City Commission. The company at first sought a straight service-at-cost franchise with a sliding scale and guarantee of 7 per cent on the agreed investment. This was refused by the City Commission. The company then applied for authority to increase fares to 7 cents, under the plea that the 6-cent fare now being charged is inadequate. Hearings were begun on Feb. 3 before the City Commission on the application.

At a recent hearing before the City Commission, Jack Beall, chief counsel for the company, made a plea for an immediate decision on the application, declaring that if the city declined to grant the increase, only one course lay open to the company—to go into the Federal Court and seek relief there on the ground that the present fares are unreasonable and confiscatory.

At the conclusion of a hearing at which J. F. Strickland, president of the company, was present, Mr. Strickland told the commission that, while he regarded the 7-cent fare as absolutely necessary to the continued successful operation of the lines, the company would accept a fare of four tickets for 25 cents, with a fare of 7 cents if paid in cash. This advance, he estimated, would mean an increase of between 4 and 5 per cent in the gross receipts of the company.

C. W. Hobson of the Southwest General Electric Company, who, with Mr. Strickland, was granted the franchise in 1917, was also a witness before the commission in the fare investigation. Mr. Hobson declared that the Dallas Railway had paid no dividend on its stock under the present franchise. Mr. Hobson said that he and Mr. Strickland were granted the franchise about the time the United States declared war and were reluctant to accept, knowing the inevitable consequence of the war. He said that they took the full ninety days allowed by the Board of Commissioners to accept, and did so then only in the hope of solving the railway problem for Dallas. Mr. Hobson said that every commitment made by the company when the franchise was accepted has been or will be carried out before May 1.

Transportation News Notes

Car Cards Quote This Paper.—A poster now being displayed in the cars of the Virginia Railway & Power Company of Norfolk reads: "The City Council of Kansas City, Mo., passed an ordinance on March 21 prohibiting jitneys from operating on streets where electric railways now operate. The Mayor signed the order on March 22. New routes must now be assigned away from car lines. — ELECTRIC RAILWAY JOURNAL."

Ten-Cent Fare in Ossining.—An order has just been issued by the Public Service Commission for the Second District of New York permitting the Hudson River & Eastern Traction Company operating in Ossining to advance its fare from 8 cents to 10 cents because the commission finds the road "performs more nearly the services of an elevator." The longest line is not more than 2 miles. The grades are very steep.

Chicago Fares Before Supreme Court.—The fight of the city of Chicago against increased fares of the Chicago Surface Lines was carried to the United States Supreme Court on April 13 when the appeal from the decision of the Illinois Supreme Court was filed in Washington. This is the case involving the jurisdiction of the Public Service Commission of Illinois, which on Aug. 6, 1919, allowed an increase in rates from 5 cents to 7 cents. Later the fare was increased to 8 cents.

Fares Come Down in Quincy.—An announcement made in Quincy, Mass., on April 14 by the home rule committee of the Eastern Massachusetts Street Railway stated that a reduction of the fares there will go into effect within a short time. This decision came as the result of a conference held a few days ago with the trustees of the railway. The committee announced that the recommendation of the home rule committee of Quincy that the number of rides per dollar be increased from thirteen to fifteen had been accepted, as it was stated the financial condition of the Quincy division warranted such reduction.

Skip-Stop System Defended—In reply to an attack by a Milwaukee women's organization on the skip-stop system of operation in the city, E. J. Steinberg, resident engineer of the Wisconsin Railroad Commission in Milwaukee, is reported to have stated: "The commission holds that where streets are less than 440 ft. apart, every other stop can reasonably be eliminated. The majority of streets in Milwaukee are less than 440 ft. apart. There are 175 streets in the city less than 340 ft. apart; more than 200 are 380 ft. apart; 75 are 510 ft. apart, and 95 are 660 ft. apart. These constitute the greatest number of car line crossings in the city."

Nine Cents in St. Joseph.—The Public Service Commission of Missouri on April 9 denied the application of the St. Joseph Railway, Light, Heat & Power Company for a straight 10-cent fare. The commission permitted the company to charge a cash fare of 9 cents, or a ticket fare of three for 25 cents, for adult passengers, and 4 cents for children. The increase became effective on April 20. It was in connection with the controversy over fares in St. Joseph that the Federal court at Kansas City, Mo., last November ruled that wrong methods had been used by the commission in valuing the company's property. The court considered the present fair value as the correct value for rate making.

Injunction Prevents Fare Action by Commission.—Fred E. Allen and W. H. Sawyer, receivers for the Alton Granite and St. Louis Traction Company, Alton, Ill., on April 2 obtained from Judge English of the U. S. District Court an injunction restraining the Illinois Utilities Commission from interfering with a proposed increase in street car fares in Alton. A case known as the 10-cent carfare case now before the commission cannot be decided until Judge English dissolves the injunction, which the city of Alton will make every effort to have dissolved. The present fare is 8 cents cash, with 7 tickets for 50 cents. The higher fare for the Alton street car system will probably be 10 cents cash with a ticket rate of eleven or twelve for a dollar. The company, tired of waiting for a decision on its 10-cent fare case, acted to hasten the fare increase.

Special Depot Car in Terre Haute.—A novel addition has been started to the street car service of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind. A special car is now run between the union depot and the Deming Hotel only. This car operates without schedule, the plan being to make immediate service available at the station upon the arrival of any train. If one of the regular cars operating on this line is at hand to take care of the travelers this special car waits until another train arrives, unless it should happen that a second car is necessary to accommodate all incoming people. In addition to making immediate car service available for all persons arriving in the city this special car will also augment the service from the downtown district to the station. The idea of installing this character of service is one of a number of good suggestions in developing new business on the depot lines, made in a paper by W. McK. White, presented before the Illinois Electric Railway Association and appearing in the issue of the ELECTRIC RAILWAY JOURNAL of July 31, 1920, page 225.

New Publications

Women Street Car Conductors and Ticket Agents

Bulletin of the Woman's Bureau No. 11, United States Department of Labor, 1921. 90 pages.

This bulletin describes an investigation made in June, July and September, 1919, and in January, 1920, by representatives of the Labor Department. The hours, wages and conditions of work of women conductors in Detroit and Kansas City and of ticket agents on the street railways in Boston and Chicago were studied. The investigation was made after the dismissal on a large scale of women conductors and women ticket agents in New York City following changes in the statute relating to the employment of women.

The report explains that the service of conductors is quite different from that of ticket agents, and this should be understood because legislation may be drafted to regulate hours for both groups together, without special consideration of the very different demands of the two occupations. In conductor service, the report points out, the conditions were more arduous on the roads examined than would otherwise have been the case because the women were the more recent employees and the best runs were chosen by the men who had seniority. Nevertheless, the report finds there is "no particular reason to prove that the work of street car conductor is unfit for women." On the contrary it seemed to combine many advantages not always found in the traditional occupations for women.

Forty-six women conductors in Detroit told the investigators that they preferred the work to any other they had ever done before. Only one woman, who used to drive a rural free delivery wagon, liked her previous occupation better. The difficulties with which both the companies and the women were faced in complying with the law in Detroit and Kansas City emphasize, however, in the opinion of the investigators, "the need for a very careful study of local conditions before any phase of a transportation law is decided upon, with a view to determining possible local adjustments to make compliance more feasible and less likely to wreck disaster upon those it was framed to benefit."

On the question of ticket agents the records from Boston and Chicago "show that with the eight-hour day and six-day week, without night work and with a wage far superior to that paid women in any other occupation, the woman ticket agent and collector is an accepted and permanent fact in two large cities." The report is an elaborate one and contains many interesting tables.

Personal Mention

Cincinnati's New Director

Mr. Kuertz's Appointment as Street Railway Director a Complete Surprise

William J. Kuertz, assistant city solicitor of the city of Cincinnati, Ohio, has been appointed director of street railways to succeed William C. Culkins, who retires on May 1 to become executive secretary of the Chamber of Commerce.

The choice of Mr. Kuertz came as a surprise to him as well as financiers, business men and city officials. Three hours after he had accepted the position he was in conference with Mr. Culkins, pertaining to street railway affairs. Mr. Kuertz accepted the position after a brief talk with Mayor John Galvin.

W. J. KUERTZ

Mr. Kuertz has been assistant city solicitor for the past three years. He began the practice of law in 1904. He is a self-made lawyer, never having attended any law school, but educated himself while employed as an office boy and later as a stenographer connected with the law firm of Ellis, Kincaid & Rogers.

In selecting Mr. Kuertz, Mayor Galvin said he was sure that he had picked a man who was capable of filling the position. The mayor said his name had not been mentioned to him by any of the business factions about town who came forward with candidates for the position, but Saul Zielonka, city solicitor, and he had discussed Mr. Kuertz for the position. Mr. Kuertz, who is associated with Mr. Zielonka, has been engaged with him in every legal action brought by the city against the Cincinnati Traction Company. He is thoroughly conversant with every one of the many legal questions which are now pending in that connection.

A conference has been arranged between Messrs. Kuertz and Culkins for the latter part of this week, so that Mr. Kuertz can thoroughly familiarize himself with all the angles of the situation.

Vacancies on Indiana Commission Filled

Governor McCray of Indiana on March 23 made his first announcement concerning appointments to important state positions, naming three members of the Public Service Commission. George M. Barnard, Republican, Newcastle, was appointed to succeed Paul P. Haynes, whose resignation was anonunced in these columns several weeks ago. John McCardle, Republican, Indianapolis, was reappointed, and State Senator Maurice Douglas, Democrat, of Flatrock, was appointed to succeed Fred Bates Johnson, Indianapolis. The appointment of Mr. Barnard is for the unexpired term of Mr. Haynes from April 1 to May 1, 1924. The reappointment of Mr. McCardle is for a four-year term from May 1, and Senator Douglas will serve four years from May 1.

The appointments were regarded as the most important which were before the Governor.

Mr. Barnard is an ex-Mayor of Newcastle. He is at present corporation attorney for the city. He has appeared before the commission several times as a representative of the public in municipal cases and is highly regarded at the statehouse. Mr. Haynes, who resigned recently, became engaged in special practice of the law in Indianapolis on April 1.

Mr. McCardle is vice-chairman of the commission. He was first appointed by ex-Governor Goodrich four years ago. He has served on the commission during the important war and readjustment periods when many complex problems were presented to the commissioners for solution.

State Senator Douglas represented Shelby and Bartholomew counties in the recent General Assembly. He was elected State Senator in 1916. He served several times as a member of the House prior to his election as Senator. Mr. Douglas is secretary of the Indiana Federation of Farmers' Associations. Mr. Johnson, who is to be succeeded by Senator Douglas, let it be known some time ago that he was not an applicant for the appointment. He is expected to resume the practice of law in Indianapolis.

There are five members of the commission. E. I. Lewis, Republican, Indianapolis, is chairman. Glen Van Auken, Democrat, is the other member of the commission.

Long Service Rewarded

J. W. Harris, for Thirty-six Years Manager of California Cable Road, Becomes President

James W. Harris, of the California Street Cable Railroad Company, San Francisco, Cal., recently was elected president and general manager and chairman of the board of directors. Mr. Harris began work with the company April 1, 1879, in a construction gang, and has served continuously since.

His first work with the company was as a carpenter in the construction of an extension of the line from Filmore Street to Presidio Avenue. When the work on this line was finished Mr. Harris was transferred to the car shops and in three years he had been promoted successively to foreman and master mechanic.

In 1891 Mr. Harris was given charge of the extension of the line along Hyde-Jones and O'Farrell Streets and from Kearny Street to the ferry.

Following the death of James B. Stetson, president of the road, in 1909, Mr. Harris was made vice-president and general manager, and was given a place on the directorate. At that time J. Henry Meyer was elected president. At a directors' meeting following the death of Mr. Meyer a few weeks ago Mr. Harris was elected to his place, meanwhile retaining his post as general manager.

J. W. HARRIS

John T. McGhee, who had been assistant superintendent, was made superintendent, and Harry N. Stetson, son of the former president, was elected to the board of directors.

With a record of thirty-six years as superintendent and general manager of the California Street line Mr. Harris is one of the oldest American street railway executives in point of service.

Charles F. Arendt, for many years employed by the Trenton & Mercer County Traction Corporation, Trenton, N. J., has been promoted to the position of chief inspector. He succeeds Harry West, who has been made night foreman at the company's carhouse in South Trenton.

Governor's Appointments Show Wide Choice

Political Affiliations Ignored in Selection of Members for New York's Transit Commission—State-Wide Commission All New

George McAneny, formerly president of the Borough of Manhattan and president of the Board of Aldermen, was named as chairman of the Transit Commission, a body created with the broadest authority the state can bestow on an administrative agency under its police powers, and with a mandate to clear up the muddled transit situation in New York City. The other appointments to the Transit Commission are Le Roy T. Harkness of Brooklyn and Major General John F. O'Ryan of New York. William A. Prendergast of Brooklyn will be chairman of the State-wide Public Service Commission. His associates will be William R. Pooley of Buffalo, Charles Van Voorhis of Rochester, Oliver C. Semple of New York, and Charles G. Blakeslee of Binghamton. All these appointments, which were sent by Governor Miller to the Senate on April 16, have been confirmed.

MR. McANENY has long been active in public life. Among his accomplishments during his municipal service was his long fight in the Board of Estimate for the adoption of the dual subway system.

Among other positions of public service Mr. McAneny has been president of the Board of Aldermen and president of the Borough of Manhattan. He started his career as a newspaper man, going back to it as associate business manager of the New York *Times*, in 1915, a post he relinquished only recently.

Mr. McAneny was born in Greenville, N. J., on Christmas eve, 1869. He was educated in the public and high schools of Jersey City, later studying law, although he never practiced at the bar. He served on the committee which framed the municipal home rule amendments to the State Constitution adopted in 1894.

Le Roy T. Harkness, former legal adviser to the New York Public Service Commission, is credited with signal service in safeguarding the city's interest in the drafting of the dual subway contracts. He has had a wide experience in New York traction affairs because of his long service with the commission.

Recently, with the co-operation of Charles E. Hughes and Oliver C. Semple, Mr. Harkness undertook a study of the traction situation in New York at the request of the Merchants Association. Mr. Harkness paid particular attention in his report to the underlying securities of the city's transit lines and their relation to the actual value of the properties. The report is in the hands of the Merchants' Association, which has already made known its willingness to offer it to the new commission.

John F. O'Ryan, although a lawyer by profession, has long been a soldier. He enlisted as a private in the National Guard in 1897, and after a succession of promotions became a major general intrusted with the command of the Twenty-seventh Division during the war. General O'Ryan is one of the few civilians holding a diploma from the War College, and was the only militia officer to command a division in the A. E. F. He was born in New York in 1874.

Of the commissioners who will serve on the transit board Mr. McAneny and General O'Ryan are Democrats. The former is classed as an independent, while General O'Ryan has been favored by Tammany Hall for positions in the public service. Politically Mr. Harkness classes himself as an independent Republican. All the new members of the Public Service Commission are Republicans. The salaries of each commissioner will be $15,000 a year.

William A. Prendergast is an authority on municipal financing and accounting. Throughout his long political career, which brought him into the office of Comptroller of the City of New York for the first time in 1910, Mr. Prendergast has been active in discussions of the city's transportation problem. Recently he has attacked Hylan's "do-nothing" policy, asserting that the Mayor by his attitude had forfeited the right to interfere. He has been a strong advocate of Governor Miller's traction plan.

Mr. Prendergast was born in New York on May 23, 1867, and attended public schools in Manhattan and Brooklyn. He entered business at the age of fourteen.

Oliver C. Semple is a New York lawyer, who has had an extensive experience in traction affairs. He aided in the drafting of the original Public Service Commission law and was himself counsel to the commission between 1907 and 1918. He was largely responsible for the drafting of the revision of that law and of the revision of the rapid transit act of 1920. He also assisted in drawing up the Interborough and the Brooklyn Rapid Transit contracts in 1913. Mr. Semple has been a consistent supporter of Governor Miller's traction plan, declaring that home rule was not involved in the situation and that "'public interest' means something more than the interest of one city or its people."

Charles G. Blakeslee of Binghamton is a Republican power in Broome county. He is a lawyer by profession, but an engineer as well. He has been corporation counsel of Binghamton, and has appeared at legislative hearings in opposition to the Governor's traction bill.

William R. Pooley was colonel of the old Seventy-fourth of Buffalo. He is a lawyer by profession.

Charles Van Voorhis is a lawyer of Rochester, of the firm of John Van Voorhis & Sons. During the war he served in the navy.

The Transit Commission is approaching a most complicated task. Questions of law, finance and the mechanical details of subway, elevated and surface operation must be considered in all their aspects before a single comprehensive plan at which the Governor aims can be evolved.

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LE ROY T. HARKNESS

Photo by Paul Thompson
GEORGE McANENY

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MAJOR-GEN. J. F. O'RYAN

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W. A. PRENDERGAST

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Cut of Ten per Cent on Steam Flow Meters

Considerable Interest Shown in This Product as Means of Checking Boiler Room Costs—Prompt Deliveries

One of the large manufacturers of steam flow meters has reduced prices 10 per cent effective April 19, but so far as can be learned other producers have not taken similar action. Considerable interest is being manifested in flow meters on the part of electric railways and power companies, it is reported, as a means of checking up boiler room costs and effecting economical operation. Demand, of course, under present adverse general market conditions, is not as large as has been the case, but at the same time a fairly good volume of business is being placed, several producers report. As a rule manufacturers do not stock this class of goods but at the same time deliveries are prompt and can be made in ten days or under.

Cement Prices Drop 60 Cents per Barrel

Demand Is on the Increase, but There Is Little Likelihood of a Shortage This Year

Consumers of cement are now able to buy this product at 60 cents per barrel cheaper than it cost the first of this month owing to a reduction in the price of bags in which cement is shipped. These formerly cost 25 cents each but manufacturers announced about the first of the month that on April 10 they would begin to ship cement in bags for which they now charge 10 cents each, thus accounting for the decrease noted above. The retail price of cement delivered at New York is now $3.50 per barrel. This compares with a peak price of $5.10 per barrel which was still in effect early last November.

Producers express satisfaction over the way the market is beginning to improve. Electric railways are doing very little buying for there is not much new track construction work under way this spring, apparently, but on the other hand the building industry is recently showing noticeable activity. Since February the curve of demand has climbed upward and at the present time shipments are said to be very little behind 1919 which was a fairly normal year.

Good stocks and immediate shipments prevail with producers in general, and despite some reports to the effect that a cement shortage will again prevail later this year there seems little likelihood of that. The maximum annual productive capacity of the country is estimated at 147,000,000 barrels, and last year, which was considerably above the average in demand, only about 96,000,000 barrels were shipped. The limiting factors in the cement supply for 1920 were railroad tieups, labor and coal shortages, and all these conditions are now very favorable for a large production if necessary.

Railways Not Turning to Used Equipment Market

Plentiful Supply of Material Awaits Anticipated Increase in Buying, but Present Demand Is Light

In view of depleted finances which, with many electric railways, has been the main factor in curtailing buying of new equipment to low levels, it might be thought that traction companies are turning to the second-hand market at this time as a source of supply. This is a logical conclusion, dealers in that field state, and ordinarily would hold true, especially in view of high prices of new material. At the present time, however, representative companies dealing almost exclusively with used electric railway products report that the market is extremely quiet. The chief factors inducing this inactivity are the declining state of the market, lack of finances and the need for labor readjustments on the part of railways.

There is a strong potential demand for good second-hand cars, trucks, motors and control equipment, electric locomotives and also for power plant equipment. With the large needs of electric railways in this respect in view, dealers are optimistic that with improving business conditions they will find a strong demand later in the year. Acting on this basis at least one of the leading factors in the market is going right ahead and stocking material but others are buying little or nothing to carry in stock. Those who are pursuing the latter course may be induced to do so by the fact that nearly all classes of material are in plentiful supply and can be picked up as needed, and furthermore, dealers' stocks are fairly well filled as it is.

A feature of the current demand is that most interest, it is stated, is being shown in double-truck rather than single-truck equipment to be used for one-man operation. Prices may still be said to represent peak quotations on second-hand material, for decided reductions have not been made, but on the other hand it must be remembered that dealers in used equipment advanced prices but sparingly the past few years.

Start of New Coal Year Finds Production Drastically Cut

Market Is Quiet with No Increase in Demand from British Strike—Prices Firming Slightly

With the ending of the coal year 1920-1921 on March 31, now three weeks past, little actual improvement is seen in the slump which the bituminous coal market is undergoing. Expectations of an increased demand resulting from the British coal strike have not been realized, and with the passing of the danger of a general strike in Great Britain there seems little likelihood of any increased buying from that source. The strike has now been in effect three weeks, and though many inquiries for coal from abroad have been received actual orders are lacking, for European markets are overstocked, too.

Though the present coal market is extremely quiet and consumers are apparently indefinitely postponing placing contracts signs are not wanting of a slightly firmer tone to the market. Production has declined steadily since last November and is now ranging around the unprecedentedly low figure of 6,000,000 net tons per week, according to the Geological Survey. Except for the extraordinary period of the coal strike in November 1919, this rate of production is lower than at any previous time since early in 1914.

PRICES AT PRESENT ARE LOW

Forced sales of steam coal are now fewer and prices, as reflected by the weekly index of *Coal Age*, are not only making a determined stand against further reductions but are also even firming slightly. As a matter of fact present prices are equivalent to those of two years ago, though labor costs have risen some 40 per cent since then. Furthermore, with reduced man power and an increasing number of coal cars in bad repair on steam roads, prospects of a car shortage on a return of anywhere near normal demand for coal are increasing. Taken all in all, indications point to a decided jump in soft coal prices next autumn.

The flat-footed refusal of union miners to consider any reduction in their scale of wages, together with the feeling that freight rates should be lower, are two factors that are important in delaying the return of buying confidence in the coal market. With a large part of the miners idle, however, and with the current volume of business of steam railroads as evidence of the crying need of rate readjustments both of these conditions bid fair to be remedied.

Tie Producers See Better Times Ahead

Increased Demand Generally Expected —Stocks Decreasing and Production Curtailed to Minimum— Prices Soft

Producers of wood ties see several factors in the present market which lead them to expect an increased demand later this year. The payment of money to steam roads under the Winslow Bill should result in additional ties being bought, it is stated. Labor prices are coming down and with the influx of immigrants under way once more the expensive labor factor in track construction should be greatly minimized. Furthermore, there has been a general buying strike due to expectations of lower prices, for one thing, and as prices have now receded a considerable amount it seems likely that the latter half of the year will show more activity than the first.

Production, it may be safely said, is confined almost entirely to actual orders, and meanwhile stocks are decreasing rather than increasing. As a matter of fact present tie stocks, especially of southern yellow pine, while adequate to make very prompt shipments, are not extra large.

There is a good deal of shopping done on the part of buyers and quotations consequently are soft. While labor costs at southern tie camps have been reduced as much as 50 per cent in some instances, it is reported, and water freight rates have also come down slightly, there seems to be a chance of still lower prices prevailing on behalf of both these factors. A representative producer reports that yellow-pine ties are about 20 cents apiece lower now than on Dec. 1. An idea of the market can be gained from the price paid by a large steam road recently for some yellow-pine ties, which was $1.85 each delivered f.o.b. car for the heart-center ties and $1.35 for the sap tie.

Several of the large steam roads have contracts for ties now in effect at the high prices prevailing early last fall. Some of these contracts still have a few months yet to run and are undoubtedly a factor in holding up the market. One road for instance has been forced to pay $1.85 for white oak ties, 8½ ft. long, 7 in. x 9 in., while the market at present is about 50 cents lower than that.

Lower Prices of Armature and Field Coils

Since the first of the year armature and field coils have dropped about 25 per cent, a large producer reports. This company's latest reduction was a cut of 10 per cent effective April 15. Another manufacturer dropped prices about 5 to 10 per cent on March 25.

Good stocks are being carried by producers and consequently deliveries are exceedingly prompt. The famine conditions of supply that prevailed last year have long since entirely disappeared. One factor in maintaining the good supply has been the mild winter just past which delt kindly with railway motors in the matter of burnouts.

Inactive Market for Car Curtains

With Prompt Deliveries and Considerably Lower Prices, Roads Are Not Repairing Summer Curtain Equipment

Producers of car curtains are one in reporting that electric railways are not repairing summer car equipment so far as curtains are concerned. For all the buying that is being done in this market at present the cars might well be run without curtains and in fact, it is stated, there is some tendency shown at present to buy new cars without curtain equipment in order to cut down expenditures. Not only are the electric lines inactive buyers but business in the steam road field is also absolutely dead, too. There is some hope expressed that sales will increase the latter part of the year, but on the other hand, some producers say they will be satisfied to make expenses this year. The one thing that would most aid a return of business, it is thought, is lower labor costs on railways.

In view of existing market conditions producers have very much curtailed their output, production in one representative case, for instance, being at only 25 per cent of capacity. Stocks of raw material now carried are ample, even somewhat larger than present conditions warrant, and deliveries are prompt, only ten days or less being required to finish an order.

The cost of cotton has of course taken a tremendous slump since the peak price of last summer, spot cotton which was worth over 40 cents a pound at that time now being quoted at about 12 cents, New York. Wages have receded slightly too, cuts of about ten per cent having been put into effect in the plants of some curtain manufacturers. Consequently prices of the finished product are considerably lower than the top price of 1920, just how much the reduction has averaged not being available, though one manufacturer reports 35 per cent.

Steel Corporation Drops Price on Sheets

The United States Steel Corporation has lowered its prices on sheets $7 to $14. This brings an even market again with corporation and independent mills on the same level. Black sheets, Pittsburgh, are 4 cents, blue annealed are 3.10 cents and galvanized are 5 cents. So far there has been no disposition to shade these prices and even with the former reductions there was little appreciable increase in demand. But with this lowered price it remains to be seen what the mills will do if the demand does not soon pick up. Sheet mill operations are running only at about a 30-per cent rate.

Iron Conduit Lower by from 5 to 10 per Cent

In line with general reductions in steel prices within the past few months—and more particularly in view of the recent drop in prices of the United States Steel Corporation on merchant pipe and other products—general reductions on conduit have been made by manufacturers. The decrease ranges from about 5 per cent to slightly more than 10 per cent on different sizes and became effective on April 14, 15 and 18 with various producers.

The general increase in discounts that was made is the same in several instances and amounts to two points on ½-in. conduit, three points on ¾-in. and 5 points on 1-in. and larger sizes, both black and galvanized. The discount on elbows and couplings is increased by three points. Incidentally, prices of the United State Steel Corporation on standard steel pipe, the raw material of conduit, have been decreased in the same proportion as the above.

Rolling Stock

Princeton (West Va.) Power Company, recently purchased two of the emergency Hog Island cars and three others released by the Bangor (Me.) Railway & Electric Company.

The Detroit (Mich.) Municipal Railway, has not yet placed contracts for the 100 Peter Witt cars mentioned in the March 19 issue and new bids will probably be called for. The company has, however, ordered twenty-five additional safety cars from the Osgood-Bradley Car Company, Worcester, Mass., at a cost of $6,695 each f.o.b. Detroit. Deliveries are to start within sixty days at the rate of two cars a day.

The New Bedford & Onset Street Railway Company, New Bedford, Mass., is converting its double-truck, closed passenger cars for one-man operation. Three cars are practically completed and these are expected to be placed in operation on the company's Middleboro division about May 15. Ten cars in all will be converted. They are Wason forty-seat cars. The summer line between Onset and Onset Junction will be operated by these, but on the line running into the city of New Bedford, two men will be used, the conductor boarding and leaving the car at the city fare limits.

Franchises

Linnton, Ore.—J. B. Schaefer, S. P. Parr and Louis Osberg have obtained a franchise from the County Commissioners to operate an electric railway along St. Helens road between Linnton and Twelfth and Burnside Streets. The franchise, approved as to form by Deputy District Attorney Pierce, is to continue in force until Aug. 20, 1940. A 10-cent fare is provided.

Track and Roadway

San Francisco (Cal.) Municipal Railway.—City Engineer O'Shaughnessy of the city of San Francisco, Cal., has been instructed by the Supervisors to prepare estimates of cost for extending the San Francisco Municipal Railway to the Ocean View District.

Evanston (Ill.) Railway.—This company will lay about 250 ton of new rail, replacing present track, this summer. Work is now in progress to replace all of the overhead copper. These replacements will bring the physical condition of the Evanston property up to a high standard.

Androscoggin & Kennebec Railway, Lewiston, Me. — The Androscoggin & Kennebec Railway has placed orders for one G. E. automatic substation control and one Westinghouse 500-kw. rotary converter with transformer and switchboard.

Tulsa (Okla.) Street Railway.—According to the city attorney the Corporation Commission will instruct the Tulsa Street Railway to double-track the Kendall and Main Street lines, and to spend about $388,000 within the next year in extensions and improvements.

Brantford (Ont.) Municipal Railway.—City Council has passed by-laws providing for the issue of debentures for the sum of $80,000 for extension, improvements and addition to the Brantford Municipal Railway, and for the issue of debentures for an additional sum of $40,000 for the construction of the St. Paul's Avenue subway.

Ohio Electric Railway, Springfield, Ohio.—The work of eliminating the grade crossing at Mount Street on the Norfolk & Western tracks will be delayed because of the inability of the Ohio Electric Railway to perform its share in the work. The Ohio Electric Railway is in the hands of a receiver.

Blue Ridge Traction Company, Danielsville, Pa.—The Blue Ridge Traction Company expects to build an extension during this year of three miles from Walnutport to Palmerton. Bids are now open for the construction work.

Montreal (Que.) Tramway.— Construction of direct tramway line to Model City is contemplated by Montreal Tramways.

Dallas (Tex.) Railway.—The Dallas Railway has begun work on the Seventh Street extension of the Tyler Avenue line in Oak Clix, one of the extensions to which the company was committeed under the terms of the franchise granted the Strickland interests in 1917. Work on this line had been postponed and additional time granted by the city on several occasions, due to the unsettled conditions and the inability of the traction company to purchase material. The line will be single track, and will cost approximately $100,000, according to estimates of the engineers of the traction company.

Mesaba Railway, Virginia, Minn.—The Mesaba Railway expects to install eight road crossing signals shortly.

Newell Bridge & Railway Company, Newell, W. Va.—The Newell Bridge & Railway Company expects within the next two months to refloor its bridge over the Ohio River. White oak ties 6 in. x 8 ft. x 8 in. will be used and white oak planking, largely 3-in. stock.

Power Houses, Shops and Buildings

Cincinnati (Ohio) Traction Company.—Preparatory to purchasing power from the Union Gas & Electric Company, the Cincinnati Traction Company has asked the city street railway director, to approve an expenditure of $380,000 to equip seven transformer stations in different parts of the city. Three of the stations will work automatically. The contract for purchase of the power goes into effect in September.

Professional Note

Lawrence P. Crecelius and Victor B. Phillips announce their association in the firm of Crecelius & Phillips, consulting, constructing and operating engineers with offices at 1302 Hanna Building, Cleveland, Ohio.

Trade Notes

Consolidated Steel Corporation announces the removal of its offices on April 16 to the Cunard Bldg., 25 Broadway, New York City.

The Superheater Company announces that after May 1, 1921, its general offices will be moved from 30 Church St., to 17 East Forty-second St., New York City.

The Corliss Carbon Company, Bradford, Pa., manufacturer of Corliss carbon brushes, has increased its capital stock from $500,000 to $1,000,000.

The Automatic Reclosing Circuit Breaker Company, Columbus, Ohio, announces the opening of an office at 401 National Bank of Commerce Bldg., St. Louis Mo., with C. P. Lohr as manager.

Victor T. Goggin, has severed his connection with Fred T. Ley & Company, Inc., as New England sales manager, to associate himself as contracting engineer with Dwight P. Robinson & Company, Inc., New York.

Bemis Car Truck Company, Springfield, Mass., has completed arrangements with James H. Denton, whose office after May 1 will be in the Marbridge Bldg., 1328 Broadway, N. Y. City, whereby the latter will represent the company in the territory comprised of New York, Pennsylvania, New Jersey, Delaware, District of Columbia, Virginia and Maryland. Mr. Denton in addition will continue as agent of the companies he has previously represented.

The Haskell & Barker Car Company, Michigan City, Ind., in its annual financial statement recently issued shows gross profits of $3,789,390 for the year ended Jan. 31, 1921. Expenses for repairs, renewals and maintenance amounted to $511,070, $300,000 was allowed for depreciation, and estimated federal taxes were $700,000, leaving a balance of $2,278,319. Quarterly dividends paid during the year totaled $880,000 so that the sum of $1,398,319 remained to be added to surplus. The report states that the non-payment of money owed the railroads by the government was effective in bringing to a halt the buying movement of railroads. Recent remedial legislation is expected to bring relief in that respect.

International Combustion Engineering Corporation Holdings.—What has been characterized as one of the biggest accomplishments in the development of stoker business and combustion business generally thus far is the organization of the International Combustion Engineering Corporation to control the Combustion Engineering Corporation of New York and the Underfeed Stoker Company, Ltd., of London, England. It owns almost all the stock of both these companies and of course controls also their subsidiary companies and representatives. The Underfeed company occupies in England a position similar to that of the Combustion company in this country, and the former company has agencies and representatives throughout the world.

New Advertising Literature

Solder.—The Union Smelting & Refining Company, Inc., St. Charles Street, Newark, N. J., is putting out a new handy-package "Usarco" solder in stick form for electrical use.

Catalog.—American Jobbers Supply Company, Woolworth Building, New York City, has recently issued bulletin No. 7 covering its line of crossarms, line hardware, glass insulators, wood pins and brackets.

Evaporators.—"Lillie Evaporators for Waste Waters and Solutions Generally" is the title of bulletin 11 distributed by the Wheeler Condenser & Engineering Company, Carteret, N. J., describing the Lillie evaporator.

Pumping Equipment. — The Goulds Manufacturing Company, Seneca Falls, N. Y., has issued a catalog describing the Goulds "Autowater" system, electrically-driven pumps, etc. The company is also circulating a small booklet giving instructions for the installation, operation and care of Goulds "Hi-Speed" pumps.

Screw Thread Standards.—The Bureau of Standards, Department of Commerce, Washington, D. C., is distributing miscellaneous publication No. 42, entitled "Progress Report of the National Screw-Thread Commission." The report contains standards for screw threads ascertained and established by the commission.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors
HARRY L. BROWN, Western Editor
N. A. BOWERS, Pacific Coast Editor
HENRY H. NORRIS, Managing Editor
DONALD F. HINE, Editorial Representative
H. S. KNOWLTON, New England Editor
C. W. SQUIER, Associate Editor
C. W. STOCKS, Associate Editor
A. D. KNOX, Editorial Representative
G. J. MACMURRAY, News Editor
GEORGE BUSHFIELD, Editorial Representative

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New York, Saturday, April 30, 1921
Number 18

Lest We Forget the War Veterans

TWO years ago some four millions of men who had been wearing the khaki of the military service or the blue of the naval arm were in process of being discharged from the duties they had performed so splendidly and they were seeking to re-enter the normal fields of industry. To a very considerable extent, employers endeavored to take care of all returning former employees by reinstating them in their old jobs or supplying better ones. The great industrial activity of 1919 and the early part of 1920 made it comparatively easy for many others to find lucrative employment. Patriotic organizations helped by the exertion of every legitimate means to aid the returned soldiers to find jobs. Now the tide has turned. The industrial depression has resulted in the throwing of thousands of persons out of work, among them many former service men, and there has been increased activity on the part of the various organizations of veterans for bonus legislation and preferential treatment in civil service appointments.

Whether the payment of additional compensation in the form of a bonus to veterans is advisable at this time is debatable, but the street railways and manufacturing companies are in a position to help the situation to some extent by not forgetting to practice a reasonable amount of preference in the employment of veterans wherever it is possible to do so. While forces are not being increased to any extent at present, there is always a certain amount of turn-over, even in the dullest of times. It is worth remembering that these four million or so of young men spent months of anything but ease or comfort at an average wage of a trifle over $30 a month, while those who remained at home were seldom making less than that much per week, and in the great majority of cases far more. Hence it would appear that the ex-service man can well receive preference among two or more prospective employees, other conditions being equal.

Situation in New York City Reviewed

FOR those who wish to have a brief résumé of the New York transit situation, the review by Herman A. Metz, published elsewhere in this issue, should be most welcome. Mr. Metz has had an active part in much of the history which he recounts, having been Comptroller of the city of New York from 1906 to 1910, and he points out clearly that the only way to solve the problem is to take the question out of politics and find out what the present conditions are, and this the new commission is empowered to do.

The result of the active debate on Governor Miller's plan, both before and after the passage of the act, has been greatly to help the citizens of New York to understand the traction problem, and addresses by Mr. Metz and others have aided in this general education. The personnel of the new transit commission gives promise of a thorough study of the situation, coupled with an intelligent solution of it, although it may be expected that the city administration will exert every effort within its power to block the progress of the inquiry by legal means.

The traction situation in New York is admittedly complicated, involving as it does a large number of companies, some being lessors and others lessees, some being solvent and others not, and some being parties to special agreements with the city while others operate under franchises as old as any in the country. Nevertheless, similar problems, differing in complication only in degree, have been successfully solved in other cities in this country, and there is no reason to expect a failure in New York, once the commission gets to work.

A Budget Is Good, but It Need Not Be a Straitjacket

THE necessity for applying the brakes to operating expenses on electric railway properties has brought the budget to the fore as a factor in cost control. On many properties the budget system has been successfully used for a long time. It has helped them to keep going when without it they would not have known where they were headed until too late to change their course. On the other properties the budget plan has been installed recently, but is already bringing good results. There are still, however, many opportunities to inaugurate this plan.

To be successful a budget system must interest the individuals who actually control the spending of money. It is not sufficient for the manager and the comptroller to agree on the amounts that can be allotted to the several departments. Undoubtedly these officials have authority to tighten up on the pursestrings as they see fit, but they cannot inculcate and foster the spirit of real company thrift unless they can secure co-operation on the part of the ultimate spender. This is the factor which insures the success of budget plans like those used by the Boston Elevated Railway, the United Railways & Electric Company of Baltimore, the Cincinnati Traction Company and the Rochester & Syracuse Railroad, discussed in recent issues of this paper respectively by E. M. Flint, C. D. Emmons and W. C. Culkins, and in the present issue by D. E. Crouse.

Granted that the ultimate spender's interest in the budget must be secured, it is up to the management to enlist this interest. He must first be convinced of the necessity for economy and be inspired with a real desire to insure the profitableness of operation of the property. He must have demonstrated to him the reasonableness of the proposed limitations on his spending. And to crown it all he must know practically continuously just how well he is controlling the outgo, and must realize that if he makes good he will receive proper appreciation of his efforts.

At the same time there must be a flexibility to the budget. Circumstances arise which demand frequent readjustment. Shifting of allowances from department to department, with full consent of those concerned, may be necessary. This can easily be accomplished through co-operation, and only so.

In making the budget interesting, different means must be used. To some men graphic presentation, as used by Mr. Crouse's company, makes the strongest appeal. Others prefer "figures." They should have what they want as to form, just so the facts are made to grip them.

Schedules Committee Report Is to Be a Valuable Study

QUESTIONNAIRES sent out by the committee on economics of schedules of the T. & T. Association give promise of a valuable report on this important subject at the next convention. This committee has divided its work into three sections, the first covering definitions and analyses of car-hours and crew-hours, the second having to do with variable running time and the third with recent methods for improving handling of traffic in congested districts.

The discussion on the first subject at last year's convention developed the need for a standard classification of car-hours as between revenue and non-revenue time. One company was reported as having about 19 per cent of "bonus" time in the car-hours paid for. The burden of this on cost of operation is apparent. Benefits from a clearer understanding of the subject will be twofold. Executives should realize the desirability of regaining some of the costly working conditions which they have conceded to their employees in previous contracts, and it will be possible to get a real comparison between running time on various properties.

The second subject is somewhat allied to the above. It is undoubtedly true that many slipshod methods exist in the making of schedules, and it is hoped that the companies will agree upon more scientific methods for preparing time-tables and making changes promptly to suit traffic demands.

Methods developed in recent years for improving the handling of traffic in crowded centers are numerous, and while there may be good reasons for their non-adoption on certain properties, the committee may perform a useful service for the industry by calling attention to the arguments for and against their use in particular circumstances. Some of the methods listed in the committee's questionnaire are: Loading platforms, skipstops, safety zones, queue loading, double berthing, trailer cars, jitney control, street collectors, elimination of left-hand turns, semaphore control and turnbacks outside of congested districts. All these factors have a bearing on the movement of traffic as well as on the comfort, safety and convenience of passengers. If by the employment of one or more of these methods the car-hours can be reduced, the effect will be apparent on the cost of operation and incidentally on the rate of fare. Until a railway operator is convinced as to the effectiveness of such methods for the particular situation with which he is concerned he will not become an enthusiast. He must become a convert himself before he can convert city authorities or his patrons to the need for progressive methods.

The committee is doing well to stir up interest in such ideas, and when the matter gets around to a report before the convention a general discussion should be arranged with a view to getting the fullest possible light on the subject. The public must be educated to the fact that anything which facilitates the movement of traffic is in its interest.

"Don't Hate Your Customers" Is Good Advice to All

HOMELY principles of salesmanship formed the foundation of the talk of P. S. Arkwright, president of the Georgia Railway & Power Company, printed in last week's issue of this paper. This was a talk to platform men, but a careful perusal of it is recommended to all railway men, particularly managers and executives. It is none too strong to say that there are many of the latter who can, as advantageously as platform men, absorb some of this philosophy and expose themselves to the contagious enthusiasm of Mr. Arkwright. He calls attention to the one necessary element in any salesmanship activity when he points out with telling emphasis that the riders on the cars are the "customers." Not that this idea is new, but a good many people seem to have forgotten it. Confidence in, and respect for, a customer is one of the salesman's first requisites; this and the fact that he has something worth while selling and knows it makes his salesmanship possible. Mr. Arkwright would probably be the last man to claim or even admit that he is a salesman, but his talk is certainly the essence of salesmanship.

It is instructive to study the salesman-customer attitude in another business, namely, the hotel. The hotel, more than any other private business institution, approaches a public utility in its nature—it has service to sell only if and as it has capacity to furnish it. Obviously a room that is empty one night cannot be rented twice the next night to make up for it, any more than an empty car can carry a double load the next trip to make up the loss. Now who fails to notice the difference in manner of the hotel manager in the days when hotel rooms were at a premium and the days when there are more rooms than patrons? It is his manner under the latter conditions which is appreciated and which makes one want to come again.

A little more constant appreciation of these facts is worth while in the railway business. It means practicing salesmanship. It means conducting your business as if you had a competitor. It often means the difference between success and failure. Confidence in your customer, respectful treatment of him and appreciation of the value of what you have to sell him is worth while all down the line.

Executives Should Furnish Inspiration as Well as Education

THERE is an additional feature of the talk to platform men by Mr. Arkwright which is worth attention. It is another instance of the right sort of relation of executive to employee. Various examples have from time to time been mentioned in these columns, but it is a subject which cannot be overemphasized. There are two elements to this relationship. One is education and the other is inspiration.

The educational features—the giving of fact and viewpoint—of this talk are self-evident. But inspiring as the manner or wording may be, the full degree of inspiration can only be attained by the right sort of personal presentation. In this case it had this and railway men can usually give it. Many of them have come up through the ranks. They can talk in the language of the employee and from his point of view, and give him the necessary inspiration.

What is urged here is more constant practice of the act.

The Dull-Time Crop of Jitneys

THE number of jitneys in evidence is increasing very noticeably in many cities. This is undoubtedly a direct result of the widespread unemployment. Men who prospered during the flush times and bought automobiles, and are now out of a job, are getting into the free-lance jitney business as a temporary means of livelihood. Even in Terre Haute, Ind., where the frequent safety-car service supplied a competition that reduced the number of jitneys from more than 200 to nine not strictly competitive, there is now a considerable number of them engaged in picking up the nickels, with little regard for anything else. This flocking of the jobless into the jitney business is particularly noticed in those cities which permit them to operate without restriction as to route and schedule and free from bonds to cover liability in the protection of patrons and other users of the streets. Without any of the responsibilities of the street railway company, this dull-time crop of jitneys, coming as it does when there is a natural falling off in the traffic available, presents a competition that is glaringly unfair. It points to the desirability of securing such ordinances as will place the jitney competition on a fair basis.

The Place of the Engineer in the Electric Railway Organization

DUE TO wartime "suspended animation" in electric railway construction and rehabilitation, the engineer in this branch of industry has not been as conspicuous as he is normally. But he is there, nevertheless, and the work that he has been doing in maintaining the track, the rolling-stock and the power supply has been an important factor in the success of the railways in keeping up service under discouraging conditions. Good engineering will always form the basis of good transportation service, and a recognition of this fact by managers and the engineers themselves is necessary, not only in order that technical men retain their rightful place in the transportation field, but also because it is only thus that good quality of service can be insured.

In an address before the Cornell Society of Engineers, at a meeting held in New York City on April 21, Frank Hedley, president and general manager Interborough Rapid Transit Company, said some pertinent things about engineers. Mr. Hedley certainly knows engineers and engineering. He has to do so properly to select department heads for his great transportation machine. Moreover, he believes in engineers. Listen with the Cornell "grads" to what he says: "It is not essential for a man to have a technical college education. But this one thing is necessary. If he doesn't get his technical education in college he must get it after he starts to work. And it is difficult to get a technical education after putting in a hard day's work. The principal thing is that to be successful a man must show that he can do the job better than some one else, whether he has a college education or gets his technical training while doing practical work. A man who does this cannot be held back."

This paper believes with Mr. Hedley that the engineer is necessary in transportation work, and that the real engineer will forge ahead. The fact that he got his technical training in the railroad shop, and in construction and operating work, does not render Mr. Hedley oblivious to the advantages of the right kind of college training. But the main thing is to have real engineers in the business, college trained or otherwise.

And it is proper to add that, having them there, the "powers that be" should assign them a status commensurate with the importance of their work.

Fares Must Be Sufficient to Meet Depreciation

PUBLIC authorities in control of rates are gradually recognizing that utilities must make adequate provision for depreciation out of earnings and the consequent necessity that fares must be sufficient to permit substantial allowances for this purpose. In both the steam and electric railway industry there have been many examples of the fixing of rates by one body and the fixing of expenses by a second, as an arbitration board or national labor commission. But depreciation is an expense which accumulates without regard to either rate-fixing or expense-fixing bodies of any kind. The omission of depreciation from the year's expense account or from the balance sheet does not affect its existence in any way.

The trustees appointed to operate and administer the affairs of the Boston Elevated Railway under the public control act have met this issue squarely, as is indicated by the statements in their annual report, reviewed in the financial department of this issue. After recognizing the necessity of a change in policy as regards provision for depreciation, they state flatly that no sane management would fail to lay aside from current receipts a sufficient amount to meet renewal and replacement of property that is wearing out. They offer the public no immediate prospect of any decrease in the present 10-cent fare, giving among other reasons for the general advance in fare on practically all street railways this matter of depreciation.

There is nothing new about this situation as far as most of the men in the railway industry are concerned. The trouble has been that, with a shrinking margin between receipts and expenses, the managements have been compelled to seek some means of staving off bankruptcy. Other creditors could not be put off; depreciation allowances, but not the depreciation itself, could be.

The trustees are being subjected to criticism for this position by some elements of the public which are looking only for a possible wedge demanding fare reduction, but the fact should be recognized that every cent provided now for depreciation goes back to the public in better property, which means better service, and in the end the result will be a net saving to the public.

Quotation from the Federal Electric Railways Commission Report No. 18

ALL transportation service is for the public. Jitneys and automobile buses cannot be repressed merely for the sake of compelling people to ride on the street cars . . . . Unnecessary and destructive competition ought not to be permitted, and the community at large should conserve the established facility that still is and promises to continue for an indefinite period the principal means of local transportation . . . If the street railways are to be allowed the benefits of even a qualified monopoly, they should be required to fulfill their obligations. They must render service that is adequate and convenient at rates that are attractive.

Budget System Which Produces Results

The Rochester & Syracuse Railroad Employs a Simple Means for Predicting Income and Outgo and for the Guidance of Department Heads in Limiting Expenditures—Graphical Presentation of Data Is Largely Used—Close Co-operation Throughout Executive Staff Supplements Budget

By D. E. CROUSE
Chief Engineer Rochester & Syracuse Railroad, Syracuse, N. Y.

FOR some time the Rochester & Syracuse Railroad has been using a budget system which has resulted in increased efficiency, better co-operation among departments and a general reduction in cost of maintenance that has well justified the small outlay on bookkeeping. The method used in building up the budget and the way in which the system functions are briefly as follows:

PREPARATION OF THE TRIAL BUDGET

Some time before the beginning of the calendar year for which the budget is being constructed the several departments of the company are furnished by the purchasing agent with a price sheet, of the general form shown in Fig. 1. This shows the latest prices of the several materials used by the particular departments for which the information is furnished and the quantities purchased during the current year. By the use of this sheet and comparison with similar previous sheets the department has a basis for arriving at an estimate of the cost of materials for the ensuing year.

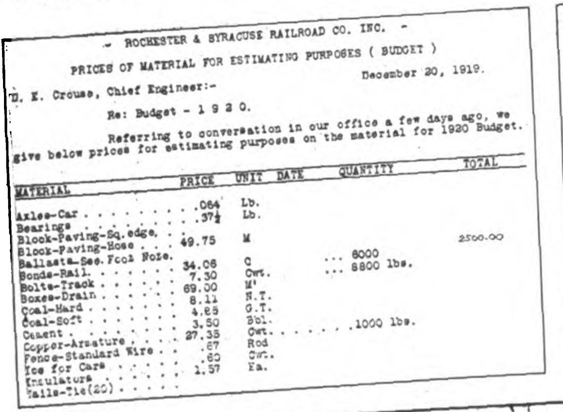
After a department head has made a careful analysis of the actual cost sheet for labor and material for the preceding year, which is made up in the form indicated in Fig. 2, he builds an estimate for the coming year and details the items which make up his proposed total expenditure.

We have found that unless department heads are furnished by the auditing department with the costs of materials and labor, itemized separately, they cannot analyze their costs correctly nor build up a budget intelligently.

After the department heads have set up their estimated expenditures under the several standard account numbers the trial budget is ready for criticism by the heads of other departments.

TESTING THE TRIAL BUDGET

The trial budgets are submitted to the scrutiny of the "cabinet," which consists of the auditor, the purchasing agent, the claim and tax agent, the general



ROCHESTER & SYRACUSE RAILROAD CO. INC.

PRICES OF MATERIAL FOR ESTIMATING PURPOSES (BUDGET)

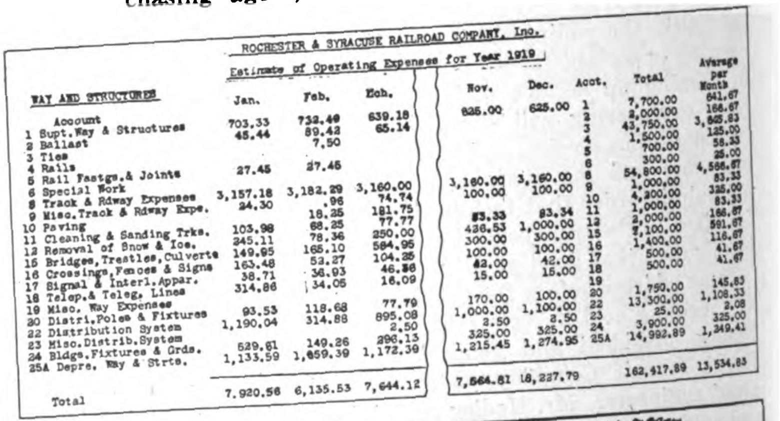
December 20, 1919.

D. E. Crouse, Chief Engineer:-

Re: Budget - 1 9 2 0.

Referring to conversation in our office a few days ago, we give below prices for estimating purposes on the material for 1920 Budget.

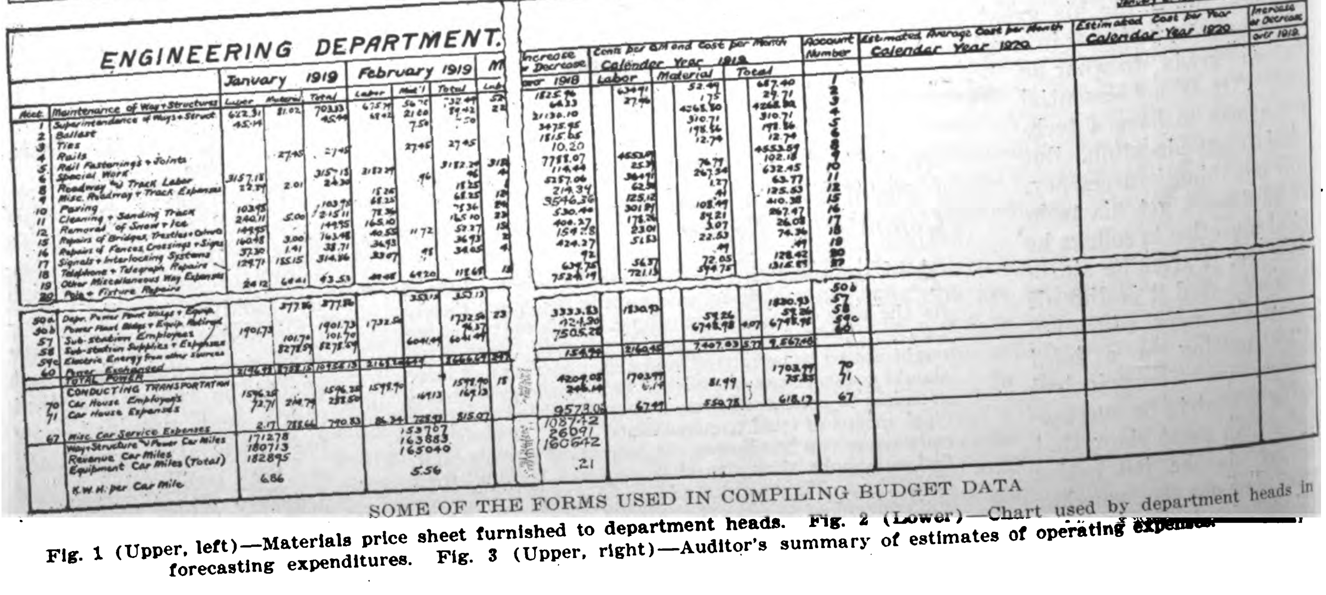
MATERIAL	PRICE	UNIT	DATE	QUANTITY	TOTAL
Axles-Car	.064	Lb.			
Bearings	.37½	Lb.			
Block-Paving-Sq. edge.					
Block-Paving-Hose	49.75	M			
Ballasts-See Foot Note.					2500.00
Bonds-Rail.	34.08	C		... 8000	
Bolts-Track	7.30	Cwt.		... 8800 lbs.	
Boxes-Drain	69.00	M'			
Coal-Hard	8.11	N.T.			
Coal-Soft	4.25	G.T.			
Cement	3.50	Bbl.			
Copper-Armature	27.35	Cwt.		.1000 lbs.	
Fence-Standard Wire	.67	Rod			
Ice for Cars	.60	Cwt.			
Insulators	1.57	Ea.			
Rails-Tie(20)					



ROCHESTER & SYRACUSE RAILROAD COMPANY, Inc.

Estimate of Operating Expenses for Year 1919

WAY AND STRUCTURES Account	Jan.	Feb.	Mch.	Nov.	Dec.	Acct.	Total	Average per Month
1 Supt. Way & Structures	703.33	732.49	639.18	825.00	625.00	1	7,700.00	641.67
2 Ballast	45.44	89.42	65.14			2	2,000.00	166.67
3 Ties		7.50				3	43,750.00	3,645.83
4 Rails						4	1,500.00	125.00
5 Rail Fastgs. & Joints	27.45	27.45				5	700.00	58.33
6 Special Work						6	300.00	25.00
8 Track & Rdway Expenses	3,157.18	3,182.29	3,160.00	3,160.00	3,160.00	8	54,800.00	4,566.67
9 Misc. Track & Rdway Expe.	24.30	.96	74.74	100.00	100.00	9	1,000.00	83.33
10 Paving		18.25	181.75			10	4,200.00	325.00
11 Cleaning & Sanding Trks.	103.98	68.25	77.77	83.33	83.34	11	1,000.00	83.33
12 Removal of Snow & Ice.	245.11	78.36	250.00	436.53	1,000.00	12	2,000.00	166.67
15 Bridges, Trestles, Culverts	149.95	165.10	584.95	300.00	300.00	15	7,100.00	591.67
16 Crossings, Fences & Signs	163.48	53.27	104.25	100.00	100.00	16	1,400.00	116.67
17 Signal & Interl. Appar.	38.71	36.93	46.36	42.00	42.00	17	500.00	41.67
18 Telep. & Teleg. Lines	314.86	34.05	16.09	15.00	15.00	18	500.00	41.67
19 Misc. Way Expenses						19		
20 Distri. Poles & Fixtures	93.53	118.68	77.79	170.00	100.00	20	1,750.00	145.83
22 Distribution System	1,190.04	314.88	895.08	1,000.00	1,100.00	22	13,300.00	1,108.33
23 Misc. Distrib. System			2.50	2.50	2.50	23	25.00	2.08
24 Bldgs. Fixtures & Grds.	629.61	149.26	296.13	325.00	325.00	24	3,900.00	325.00
25A Depre. Way & Strts.	1,133.59	1,659.39	1,172.39	1,215.45	1,274.95	25A	14,992.89	1,249.41
Total	7.920.56	6,135.53	7,644.12	7,664.81	18,227.79		162,417.89	13,534.83



ENGINEERING DEPARTMENT.

Acct.	Maintenance of Way + Structures
1	Superintendence of Ways + Struct.
2	Ballast
3	Ties
4	Rails
5	Rail Fastenings + Joints
6	Special Work
8	Roadway and Track Labor
9	Misc. Roadway + Track Expenses
10	Paving
11	Cleaning + Sanding Track
12	Removal of Snow + Ice
15	Repairs of Bridges, Trestles + Culverts
16	Repairs of Fences, Crossings + Signs
17	Signals + Interlocking Systems
18	Telephone + Telegraph Repairs
19	Other Miscellaneous Way Expenses
20	Pole + Fixture Repairs
50a	Depr. Power Plant Bldgs + Equip.
50b	Power Plant Bldgs + Equip. Retired
57	Sub-station Employees
58	Sub-station Supplies + Expenses
59c	Electric Energy from other Sources
60	Power Exchanged
	TOTAL POWER
	CONDUCTING TRANSPORTATION
70	Car House Employees
71	Car House Expenses
67	Misc. Car Service Expenses

	January 1919	February 1919	Increase or Decrease over 1918
Way + Structure + Power Car Miles	171278	153707	108742
Revenue Car Miles	180713	163883	26091
Equipment Car Miles (Total)	182895	165040	160642
K.W.H. per Car Mile	6.86	5.56	.21

January 1919
Labor
Material
Total
February 1919
Labor
Mat'l
Total
Increase or Decrease over 1918
Costs per CM and Cost per Month Calendar Year 1919
Labor
Material
Total
Account Number
Estimated Average Cost per Month Calendar Year 1920
Estimated Cost per Year Calendar Year 1920
Increase or Decrease over 1919
Traced by
Approved by
January 2, 1920

SOME OF THE FORMS USED IN COMPILING BUDGET DATA

Fig. 1 (Upper, left)—Materials price sheet furnished to department heads. Fig. 2 (Lower)—Chart used by department heads in forecasting expenditures. Fig. 3 (Upper, right)—Auditor's summary of estimates of operating expenses.

traffic agent, the superintendents and the chief engineer, all under the direction of the general manager, who acts as presiding officer. At a meeting of the cabinet each department head submits his trial budget of expense and describes in detail the method used in arriving at the proposed amount for each account. He then has to show proof why his estimated amount should be allowed to stand.

As the usual criticism of the cabinet is in the direction of downward revision of estimates it is obviously necessary that the department head be well fortified if he desires to have his estimates approved.

In the discussion of the proposed expenditures such items as wage contracts and their upward or downward revision, materials costs and the trend of the materials market, weather conditions, etc., are all brought into review. After a budget system has been in effect for several years much good material is available in the records to serve as ammunition for the cabinet to use in bombarding the head who is trying to get his estimate through, so that he is distinctly on the firing line while this procedure is going on.

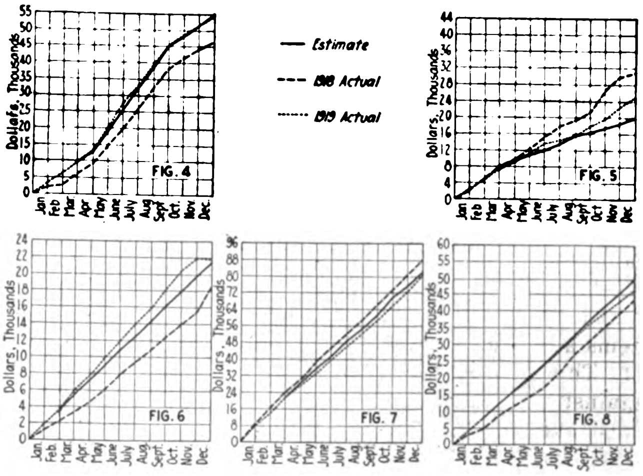
After the cabinet has arrived at a tentative expense budget the earnings for the ensuing year are estimated. To some it may seem to be a waste of time to estimate future earnings, but it is a fact that in the last budget set up by this company the gross earnings were forecasted within 1 per cent of the actual. It is, in our opinion, just as necessary to set up a bogey for earnings of the traffic department as it is to fix one for the expenses of the mechanical, the way and the power departments.

Obviously, when the earnings as well as the expenses are estimated, it is possible to set up a proposed net income, which after all is the real goal in operation.

With us, after the trial budget has been accepted after revision by the cabinet, the department head turns over his estimate to the auditor, who assembles the budgets.

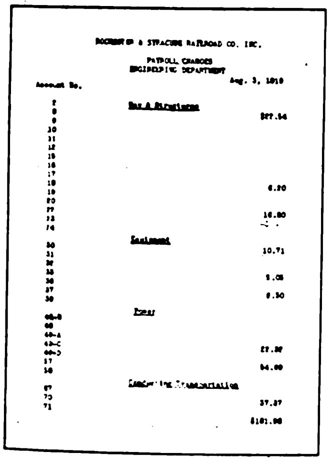
The budget is spread over the year by months, as indicated in the form reproduced in part in Fig. 3. The estimates are put into graphic form, graphs being plotted for each expense item by account number and also for the earnings. Sample graphs are reproduced in Fig. 4 to 8 inclusive. The diagrams show the actual figures for the preceding year and the estimates for the current year. The actual expenditures for the current year are then plotted in as the year advances and serve as a splendid check on variations from the budget estimate.

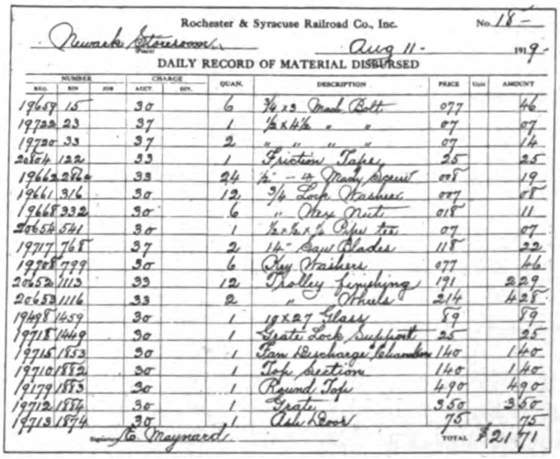
The efficacy of a budget system depends, of course,



GRAPHICAL REPRESENTATION OF ESTIMATED AND ACTUAL EXPENDITURES BY ACCOUNTS

Fig. 4—Account No. 8, roadway and track labor.
Fig. 5—Account No. 33, electrical equipment of cars.
Fig. 6—Account No. 57, substation employees.
Fig. 7—Account No. 59C, electrical energy.
Fig. 8—Account No. 64B, passenger conductors.





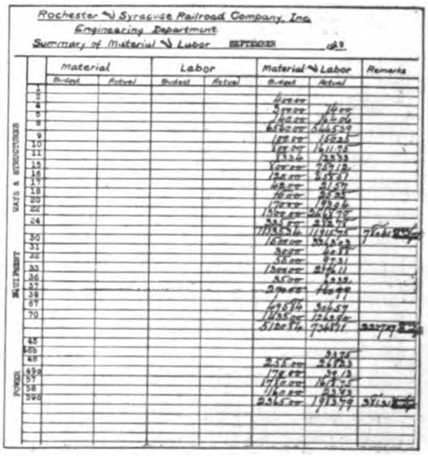
Rochester & Syracuse Railroad Co., Inc. No. 18

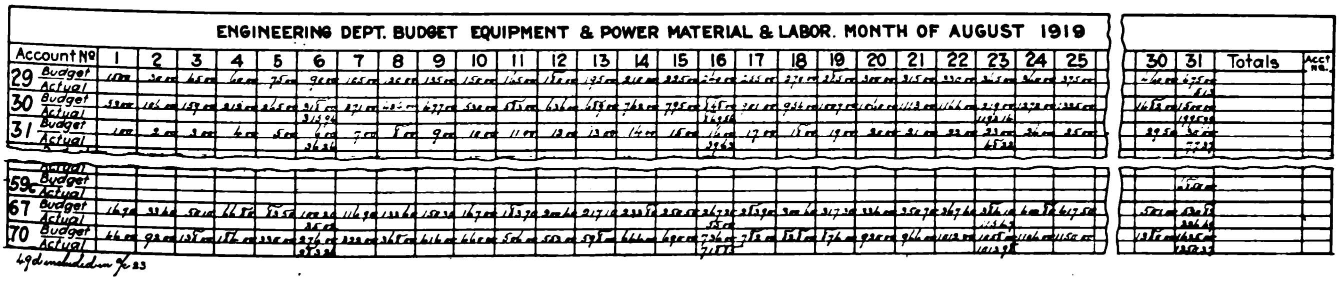
Newark Storeroom Aug 11 1919

DAILY RECORD OF MATERIAL DISBURSED

Number			Charge		Quan.	Description	Price	Unit	Amount
Reg.	Bin	Job	Acct.	Div.					
19659	15		30		6	3/4 x 3 Mach. Bolt	077		46
19722	23		37		1	1/2 x 4 1/2 " "	07		07
19720	33		37		2	" " " "	07		14
20804	122		33		1	Friction Tape	25		25
19662	282		33		24	1/2" – 4 Mach Screw	008		19
19661	316		30		12	3/4 Lock Washer	007		08
19668	332		30		6	" Hex Nut	018		11
20654	541		30		1	1/2 x 1/2 x 1/2 Pipe tee	07		07
19717	768		37		2	14" Saw Blades	118		22
19708	799		30		6	Key Washers	077		46
20652	1113		33		12	Trolley finishing	191		229
20653	1116		33		2	" Wheels	214		428
19498	1459		30		1	19 x 27 Glass	89		89
19718	1449		30		1	Grate Lock Support	25		25
19715	1853		30		1	Fan Discharge Chamber	140		140
19710	1882		30		1	Top Section	140		140
19179	1883		30		1	Round Top	490		490
19712	1884		30		1	Grate	350		350
19713	1874		30		1	Ash Door	75		75

E. Maynard TOTAL $21 71





ENGINEERING DEPT. BUDGET EQUIPMENT & POWER MATERIAL & LABOR. MONTH OF AUGUST 1919

49 d included in 7/c 23

FAMILIAR RECORDS TO ROCHESTER & SYRACUSE DEPARTMENT HEADS

Fig. 9 (Upper, left)—Sample daily list of payroll charges furnished by auditor to the several departments.

Fig. 10 (Upper, middle)—Sample daily record of materials drawn from the storeroom.

Fig. 11 (Upper, right)—Sample summary sheet for daily comparison of expenditures with budget by account numbers.

Fig. 12 (Lower)—General summary sheet for engineering department for typical month.

on the follow-up system. My belief is that there should be a daily check of expense items. When such a check is provided it is possible to control the expense, whereas if a check is made only weekly or monthly it will usually be found that it is too late to adjust the account, the bulk of the money having already been spent. On our property department heads are furnished by the auditor with daily statements of labor expenditures charged to each account number, and also copies of disbursement sheets showing the consumption of material (see Figs. 9 and 10). From these data the labor and materials items are entered on forms like that reproduced in Fig. 11. This is done daily and the expenditures are checked against the budget. A monthly summary, such as that illustrated in Fig. 12, is made up from these sheets.

In our case the department heads meet every two weeks at the general manager's office and review the budget. Hence the system serves not only to permit checking against the budget, but it forces the engineering and mechanical departments to keep themselves constantly advised of the expenditures which they are making, and as to the relation of these expenditures to the other expenditures on the property. The technical departments are mentioned specifically because their expenditures are subject to the greatest variations and control and therefore are most readily amenable to the budget system. Our plan also produces very close co-operation among the department heads as a whole, and the good-natured discussion of proposed expenditures tend to maintain a fine *esprit de corps* in the organization as a whole.

Reliability of the Automatic Substation

Experience of New York State Railways with Automatic Substation Demonstrates Dependability of Automatic Control with Reasonable Care in Inspection and Maintenance—Latest Operating Data Are Given

FOR more than two years the New York State Railways has had in operation an automatic substation on the Rochester & Sodus Bay line at Williamson, which is about 30 miles from Rochester. Details of the construction and operation of this substation were given in a paper by C. L. Cadle before the New York Electric Railway Association, abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 20, 1919. The New York State Railways has furnished some recent data as to the operation of the Williamson substation, as follows:

The cost of this substation, one of 250-kw. capacity, which was commissioned in February, 1919, was slightly more than $17,000, of which about one-third was for land and buildings, the remainder being for substation equipment and installation, including supervision. The annual cost of operation is $3,263, which is nearly $5,000 less than would be required for manual operation. The annual cost includes 10 per cent depreciation and fixed charges for land and buildings, $598; 15 per cent for depreciation and fixed charges on machinery, $1,219; actual repairs to equipment, $827; inspection and maintenance, $619. A reactance coil costing $535 was also installed during 1920, which belongs, of course, in the capital account.

During the past year interruptions to service caused by automatic equipment covered 207½ hours, and those due to other causes totaled 137½ hours, a total of 345 hours. The interruptions due to the equipment are subdivided roughly as follows: Relay failures, eight in number, average duration of interruptions, eight hours and five minutes; interlock failures, two interruptions, eleven hours and fifteen minutes; direct-current resistor failures, one interruption, forty-three hours and forty-five minutes; speed-limit-device failures, two interruptions, averaging each fifty-two hours and twenty minutes. External interruptions were due to line trouble, falling of trolley wires, failure of alternating-current power, failure of remote-control apparatus and failure of train dispatcher to cut in remote control.

The inspections given the automatic substation comprise a casual daily "once-over" and a thorough weekly inspection. An employee of the company who lives near by changes record charts and spends a total of one and one-half hours in this duty and in watching the operation, looking, of course, at all parts of the equipment. A "relief operator" spends one day each week in making a thorough inspection, tidying up the substation and filling in the record forms.

As the relief man goes over the apparatus, part by part, he fills in blank spaces on a question form which covers all details of equipment. For example, on the oil switch are these questions: Are all fulcrum pins and cotter pins placed and in good condition? Are all nuts and screws set tight? As to the oil switch mechanism, these are some of the questions: Are all nuts, setscrews and springs tight and in good condition? Are all electrical contacts tight? Are all contacts and fingers clean and in good condition? Is operation satisfactory? In all, a total of about seventy-five questions are asked.

A weekly report on interruptions is also made on an appropriate form, giving, with respect to each interruption, the date, the times of the beginning and ending of each interruption period, the duration and the cause. Space is allowed on the form for explanation, etc.

Special Library Co-operation in Boston

THE special libraries maintained by the Boston (Mass.) Elevated Railway and Stone & Webster have united with those of nine other companies in Boston representing various fields of industry, business and research in the publication of a "Union List of Periodicals and Annuals" taken by the several members of the agreement. This list comprises 750 individual publications, some of which, being extremely specialized or little known outside of particular industries, are often hard to find when wanted for immediate reference. Included, also, are all the well-known technical and trade papers, and the published proceedings of various technical, research and business organizations. The list is sold for a nominal price, which covers the cost of printing only.

By means of this list, and other co-operative measures which they employ, the librarians, or information experts as they really are, are able to secure from each other, by telephone or messenger service, the very latest published information on an extremely wide range of subjects which may be called for at any moment by the business executives whom they serve.

Lewis A. Armistead and George Winthrop Lee, special librarians respectively of the Boston Elevated Railway and Stone & Webster, were largely instrumental in the compilation and publication of the "Union List of Periodicals and Annuals."

The Automatic Substation in Electrolysis Mitigation

Results of Special Investigation Made for Scientific Purposes at Des Moines, Iowa, by the Bureau of Standards Confirm Theoretical Conclusion that Increase in Number of Feeding Points Made Possible by Automatic Control Acts to Reduce Track Gradients and Potentials

By E. R. SHEPARD
Electrical Engineer United States Bureau of Standards, Washington, D. C.

AMONG the various methods of electrolysis mitigation which have been proposed and used, the use of multiple-feeding points for railway current is considered of primary importance. The practical limit in the number of feeding points is usually set by operating costs, but with the advent of automatic control for railway substations the number of feeding points which can be economically employed has considerably increased. While automatic substations are being installed by railway companies primarily for economic reasons, improved electrolysis conditions will generally follow their installation.

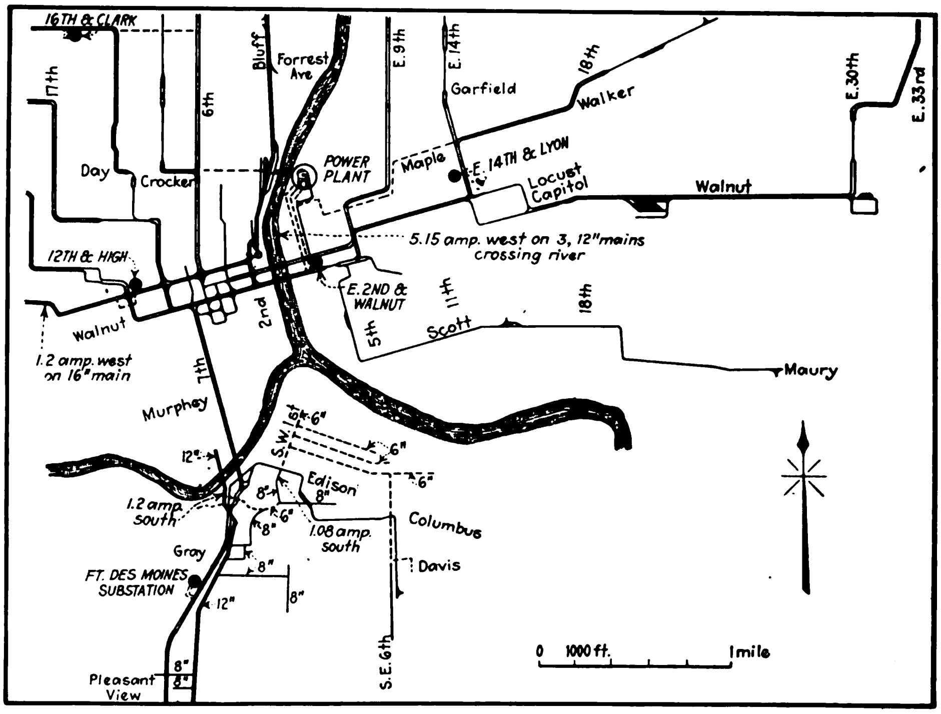


PLATE 1—CHART SHOWING CURRENT FLOW IN WATER MAINS

The Des Moines (Iowa) City Railway recently brought to a practical completion a system of automatic substations which is the most extensive for strictly urban use in the country. The engineers of the Bureau of Standards therefore considered that a thorough study of the Des Moines system, with particular reference to the electrolysis situation, would be of technical and scientific value and interest.

The Des Moines City Railway and other public utility companies in the city of Des Moines were informally consulted regarding this matter in the spring of 1919 and all agreed to co-operate in a general study of the situation. An investigation, started in September of that year, was carried out under the direction of an engineer of the United States Bureau of Standards. This was made possible through the hearty co-operation of F. C. Chambers and K. J. Keith of the railway company, H. V. Smith and G. Ireland of the Iowa Telephone Company, A. T. Luce of the Des Moines Water Company, H. R. Sterrett of the Des Moines Gas Company, J. M. Pilmer of the Des Moines Electric Company and F. R. Porter of the Western Union Telegraph Company. The necessary technical and field help was furnished by the first-mentioned three companies.

Practically no data are available showing electrolysis conditions prior to the installation of the automatic substations. From all accounts, however, very high over-all potentials existed on the track system as well as high potential differences between tracks and pipes. Measurements previously made were understood to reveal current flow on water main and potential differences which would ordinarily be considered very bad, but an examination of the pipes had shown practically no corrosion. The latter circumstance was attributed to the high resistivity of the soil in the city. The water pipes were electrically drained to the tracks by the negative bus at the power house, and it is said that very heavy currents were carried. The telephone cables were drained to the negative return feeders at several points.

Prior to the present installation of automatic substations, the Des Moines City Railway was supplied from a single feeding point at East Second and Maple Streets, involving feeding distances of 3 miles or more. Now there are six automatic substations in the city and two automatic and one manually operated substations on near-by interurban lines. Each city substation contains one 500-kw. rotary converter. With the exception of the Fair Ground line at East Walnut Street there is no feeding distance more than about 7,000 ft. With the 85 miles of single track operated by the company, including the interurban line, the mileage of track per substation is under ten.

In addition to the substations there is a rotary converter at the power house on East Second and Maple Streets, which carries the night load after the substations have shut down.

The substations at Twelfth and High Streets and at East Second and Walnut Streets operate only during the peak loads, while the other substations operate approximately nineteen hours per day. The operating voltage at the outlying stations is 650, that at the Sixteenth and Clark Streets and at East Fourteenth and Walker Streets substations is 625, while the peak load substations operate at 600 volts. This voltage adjustment is based on peak-load conditions and enables all six substations to carry their proper portions of the load during the peak. As the load drops off, the stations operating at the lower voltages are the first to shut down. In order to prevent the two peak-load stations from coming on and off unnecessarily, the switches in the high-voltage lines which supply them are closed only after the traffic becomes sufficiently great to enable the stations to stay in under the fluctuating load. The load curves of the several stations are shown on page 808, Figs. 2 to 7, and the total system load in Fig. 8. These were determined for a typical day from measurements made on the high-voltage lines, with corrections for transmission and conversion losses. They are only approximately correct.

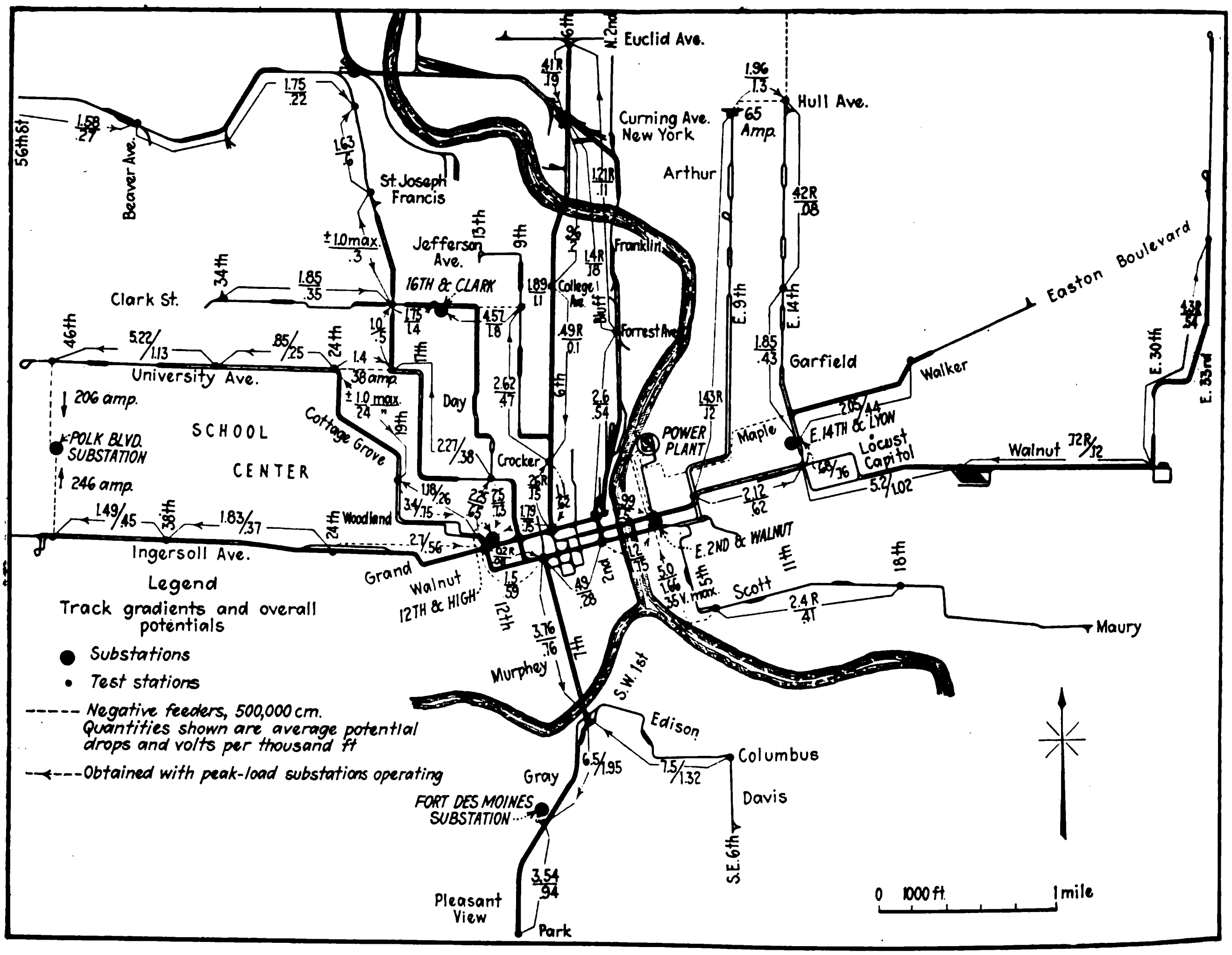

Euclid Ave.
Hull Ave.
Curning Ave.
New York
Arthur
65 Amp.
St. Joseph
Francis
Jefferson Ave.
16TH & CLARK
Clark St.
University Ave.
206 amp.
POLK BLVD. SUBSTATION
246 amp.
SCHOOL CENTER
Cottage Grove
Ingersoll Ave.
Woodland
Grand
Walnut
12TH & HIGH
Day
Crocker
College Ave.
Franklin
Forrest Ave.
POWER PLANT
Maple
Garfield
Walker
Easton Boulevard
E. 14TH & LYON
Locust
Capitol
Walnut
E. 2ND & WALNUT
Scott
Maury
Murphey
S.W. 1st
Edison
Columbus
Davis
Gray
FORT DES MOINES SUBSTATION
Pleasant View
Park
S.E. 6th
56th St.
Beaver Ave.
46th
34th
24th
19th
15th
16th
9th
6th
2nd
N. 2nd
E. 9th
E. 14th
E. 30th
E. 33rd
11th
18th
12th
1.0 max.
38 amp
35 V. max.
0 1000 ft. 1 mile
Legend
Track gradients and overall potentials
● Substations
• Test stations
----- Negative feeders, 500,000 cm.
Quantities shown are average potential drops and volts per thousand ft
—<---Obtained with peak-load substations operating

PLATE 2—RESULTS OF SURVEY OF TRACK POTENTIALS AND GRADIENTS

In the tests, track gradient and over-all potential measurements were made by the aid of about fifty pilot wires loaned by the Iowa Telephone Company. These wires were connected to the tracks at the points indicated in Plate 2. They terminated in the telephone company's exchange on binding posts installed on a map of the railway system, at points corresponding to the actual field locations. The results of the measurements are graphically shown on Plate 2.

The average values of the over-all voltages are practically all under 10 volts. Some unusually high values were observed for short periods, but these conditions were admittedly due to poor bonding. A high gradient was observed on University Avenue, between Thirty-fourth Street and Forty-sixth Street, where the negative feeder from the Polk Boulevard substation connects with the track. This was undoubtedly caused by bad track conditions.

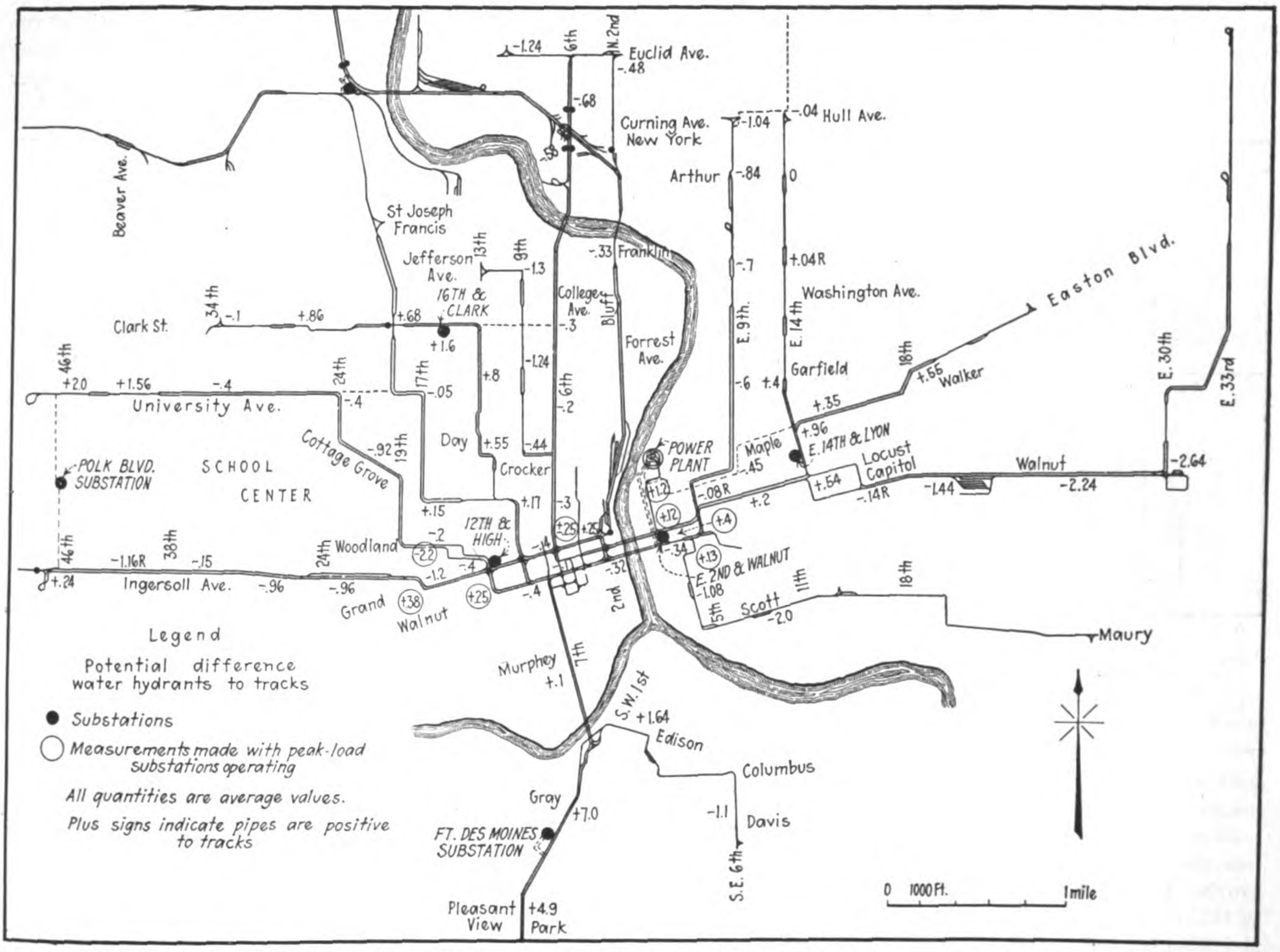
The highest gradient observed in the city was that on the Fort Des Moines line between the substation and the Raccoon River, a distance of about 3,000 ft. Here the gradient was about two volts per 1,000 ft., due not to poor track conditions but to the very heavy load carried by this substation. The tracks adjacent to the Sixteenth and Clark Streets substation are also heavily loaded, the gradients being 1.4 and 1.8 volts per 1,000 ft. However, as the distances over which these heavy gradients exist are comparatively short, the electrolysis conditions are by no means as serious as those surrounding the Fort Des Moines substation. In all other sections the gradients are comparatively low and within limits usually considered satisfactory.

POTENTIAL DIFFERENCE MEASUREMENTS

Potential difference measurements between water hydrants and tracks were made in about seventy-five locations, half-hour records being obtained with recording instruments. The results are shown in Plate 3. In the downtown districts measurements were made with and without the peak-load substations operating and both measurements are recorded on Plate 3.

The effect of the poor track on University Avenue is seen in the positive value of 2 volts as compared with 0.24 volt on Ingersoll Avenue. This condition can undoubtedly be greatly improved by repairing all defective bonds on University Avenue.

On the Fort Des Moines line average potential differences between pipes and track as high as 7 volts were observed. There are several factors which mitigate this apparently bad condition, which will be referred to later. In the Sixteenth and Clark Streets substation district the maximum positive voltage observed was 1.6 volts and in the East Fourteenth and Walker Streets district the maximum positive value was 0.96 volt. In the downtown district a generally negative condition on the pipes prevails when the peak-load stations are not operating, and a positive condition of about 0.25 volt prevails during the period when they are operating. Potential difference measurements between various cable systems and other structures were made in a number of locations. As the drainage of the telephone cables had not been adjusted to the present railway distributing system, they were found to be positive to the earth in all substation districts. It is only during recent months that the substation installation has been completed and put in normal operation.



Euclid Ave.
-1.24
-.48
6th
N. 2nd
-.68
Curning Ave.
New York
-1.04
-.04 Hull Ave.
Arthur
-.84
0
Beaver Ave.
St Joseph
Francis
Jefferson Ave.
13th
9th
-1.3
-.33
Franklin
-.7
+.04R
Washington Ave.
Easton Blvd.
34th
Clark St.
-.1
+.86
+.68
16TH & CLARK
College Ave.
-.3
Bluff
+1.6
Forrest Ave.
E. 9th
E. 14th
Garfield
18th
+.56
Walker
E. 30th
E. 33rd
46th
+2.0
+1.56
-.4
University Ave.
24th
-.4
17th
-.05
+.8
-1.24
6th
-.2
-6
+.4
+.35
Cottage Grove
-.92
19th
Day
+.55
-.44
Crocker
POWER PLANT
Maple
-.45
+.96
E. 14TH & LYON
Locust
Capitol
+.54
-.14R
-1.44
Walnut
-2.24
-2.64
POLK BLVD. SUBSTATION
SCHOOL CENTER
+.15
-.2
12TH & HIGH
+.17
-.3
+1.2
-.08R
+.2
+1.2
+.4
+.25
+.25
46th
38th
24th
Woodland
-1.16R
-.15
+2.2
-.4
-.14
-.32
-.34
+1.3
E. 2ND & WALNUT
-1.08
+.24
Ingersoll Ave.
-.96
-.96
-1.2
Grand
+.38
+.25
Walnut
-.4
2nd
5th
Scott
-2.0
11th
18th
Maury
Murphey
7th
+.1
S.W. 1st
+1.64
Edison
Columbus
Gray
+7.0
-1.1
Davis
FT. DES MOINES SUBSTATION
S.E. 6th
Pleasant View
+4.9
Park
0 1000 Ft. 1 mile
Legend
Potential difference water hydrants to tracks
● Substations
○ Measurements made with peak-load substations operating
All quantities are average values.
Plus signs indicate pipes are positive to tracks

PLATE 3—RESULTS OF POTENTIAL DIFFERENCE MEASUREMENTS BETWEEN WATER HYDRANTS AND TRACKS WITH AND WITHOUT PEAK-LOAD SUBSTATIONS OPERATING

It was generally agreed in the discussion of this subject that the cables should be drained at all substations, but only during such periods as the substations operate. Such an arrangement will require the installation of an automatic switch, at each substation, which will be actuated from the terminals of the rotary converters, so as automatically to connect the drainage cables to the negative busbar during the period of operation. The railway company will install such switches.

It is presumed that the railway will extend a common drainage cable from each such switch to some point convenient for all cable-owning companies to connect to it. It is proposed that the telephone company should install a No. 0000 copper drainage wire in each substation district, employing aërial sheaths when necessary to reach the underground plant. Measurements will be made by other cable-owning companies to determine whether their cable system needs drainage.

CURRENT FLOW IN WATER MAINS

Measurements of current flow in water mains were made in six locations, the more important of which are shown in Plate 1. All of these currents were small, the largest being 5.15 amp. on three parallel 12-in. cast-iron mains which crossed the Des Moines River on Locust Street.

The highly positive piping system south of the Raccoon River, shown in Plate 1, is supplied by only two water mains from the north, one a 12-in. cast-iron main crossing the Raccoon River at southwest Ninth Street and the other an 8-in. main on southwest First Street. These pipes were found to be carrying 1.2 amp. and 1.08 amp. respectively. As the railway load from the south is comparatively small, and as the distribution water system is not extensive, it is not likely that any appreciable current is carried into this positive area over the main from the south.

Five soil samples were collected by Mr. Sterrett of the gas company from open trenches in the downtown district and were tested for resistivity. These had an average resistivity of 3,100 ohms for 1 cu.cm. as received, and 1,800 ohms when the samples were saturated with moisture. The latter figure is about three times that for the resistivity of New Orleans soil and about twice that for the soil in the downtown district in St. Louis, but considerably lower than that for Washington and Philadelphia soils. The earth south of the Raccoon River along the Fort Des Moines lines is undoubtedly of a much higher resistivity than the samples tested.

It is apparent from the results of the tests that electrolysis conditions in general have been greatly improved by the installation of the several substations. With one or possibly two exceptions track gradients and over-all track potentials will be reduced to satisfactory values when all the tracks are properly bonded.

The one location where gradients appear to be excessive is south of the Racoon River along Fort Des Moines line. Considering the small amount of current entering the piping system adjacent to the Fort Des Moines station, caused probably by the relatively high resistance of the earth in this locality, the high potential differences observed are not to be taken as a measure of the hazard involved. However, as the current discharged may be largely concentrated at the few points where mains cross under the tracks, it seems desirable to reduce the potential difference between the pipes and the tracks in this area. This could be done either by the use of a 1,000,000-circ.mil insulated negative feeder from the Fort Des Moines substation to the junction point on the tracks south of the Raccoon River, or by a moderate amount of pipe drainage under proper control and supervision.

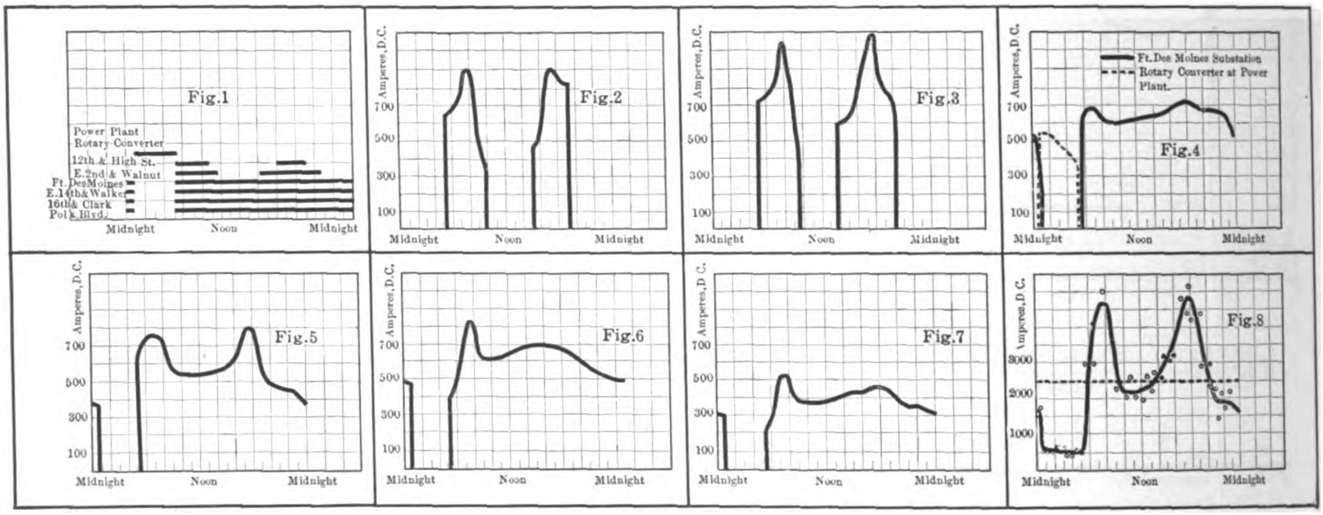
If the first plan were used, the feeder would be 3,000 ft. long, and a resistance would be inserted between the negative bus and the adjacent track to give a potential drop of 10 volts between the track and the negative bus. This would involve an investment cost of $2,400 and an annual cost of $590 for power at one cent per kilowatt-hour.

A similar calculation was made for reducing the potentials in the vicinity of the Sixteenth and Clark Streets substation, although the need of improvement there is not as great as in the other case. Here a 500,000-circ.mil cable 4,000 ft. long with the necessary resistance taps would cost about $1,650 and the annual power cost would be $235.

The pipe drainage would be less expensive, but if this plan is to be employed in the district south of the Raccoon River, a preliminary test is suggested to see if the potential of the pipe can be lowered to proper values without excessive drainage current and to determine if practicable whether any objectionably high resistance joints exist in the 12-in. water main on southwest Ninth Street.

In conclusion it may be said that as a general policy it is very desirable that voltage measurements and inspections should be made from time to time on all cable and piping systems, as changing load conditions and the failure of rail bonds and drainage bonds are more than likely to establish bad local electrolysis conditions.

The importance of track maintenance cannot be too strongly emphasized. This is the prime requisite for good electrolysis conditions and without it no system of mitigation is entirely effective in protecting underground structures.



CHARACTERISTICS OF RAILWAY POWER LOAD AT DES MOINES, IOWA

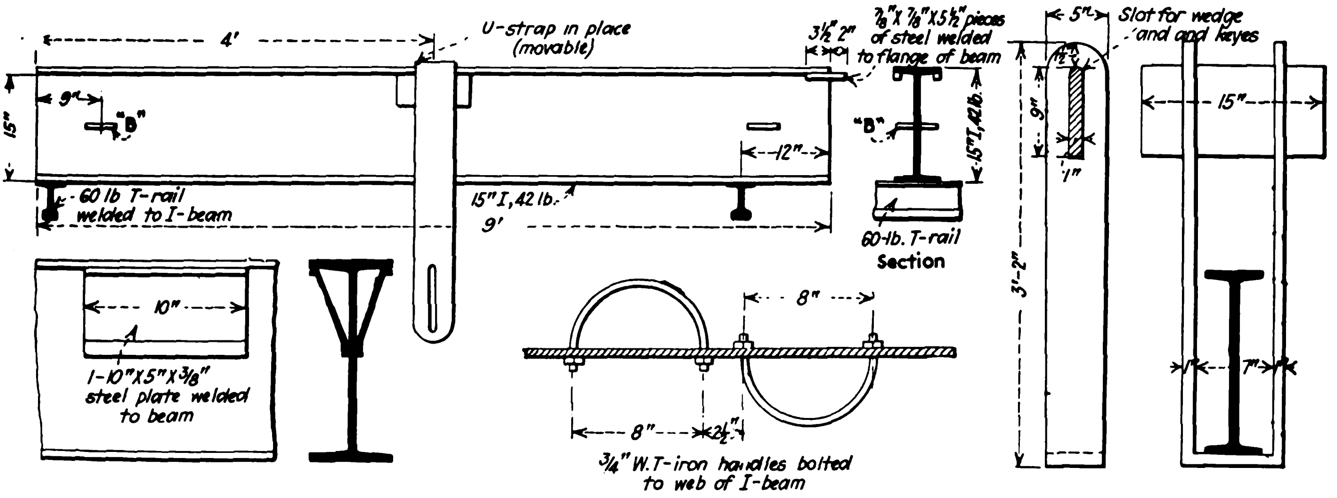
Fig. 1—Normal periods of operation of automatic substations.
Fig. 2—Station load curve, Twelfth and High Streets.
Fig. 3—Station load curve, East Second and Walnut Streets.
Fig. 4—Station load curve, Fort Des Moines substation and rotary converter at power plant.
Fig. 5—Load curve of converter substation at East Fourteenth and Walker Streets.
Fig. 6—Station load curve, Sixteenth and Clark Streets.
Fig. 7—Station load curve, Polk Boulevard.
Fig. 8—Total railway load.

The American Society of Civil Engineers at its 1921 annual meeting accepted the offer of *Engineering News-Record* to establish an "Arthur M. Wellington Prize" to be awarded annually for the best paper presented before the society on any phase of the science and art of transportation. The prize is a memorial in honor of a former editor of *Engineering News* and the author of the well-known book entitled "The Economic Theory of Railway Location."

Rehabilitating Track in Massachusetts

Welding in Various Ways Is Used on a Large Scale—During 1920 the Sum of $1,600,000 Was Spent on Trackwork—Vertical Rail Benders Have Been Perfected—Lighter Track Considered Possible Owing to Extensive Use of One-Man Cars

WELDING will be used extensively for joint maintenance on the property of the Eastern Massachusetts Street Railway during 1921. An extended account of the track maintenance methods followed during 1919 and 1920 on this property was given in a paper presented at a meeting of the New England Street Railway Club on Dec. 2 by Frank B. Walker, engineer maintenance-of-way of the company. This paper was published in abstract on page 1237 of the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 18, 1920, but further particulars will be of interest. A table showing the work done during the past two years is given below:


4'
U-strap in place (movable)
3½" 2"
⅞"X⅞"X5½" pieces of steel welded to flange of beam
5"
Slot for wedge and and keyes
9"
"B"
15"
12"
"B"
15" I, 42 lb.
½"
9"
1"
15"
60 lb T-rail welded to I-beam
15" I, 42 lb.
9'
60-lb. T-rail
Section
3'-2"
8"
10"
1-10"X5"X⅜" steel plate welded to beam
8"
2½"
¾" W.T-iron handles bolted to web of I-beam
1"
7"
1"
Detail of Steel Plate Reinforcement
Detail "B"
Detail of U-Strap

VERTICAL RAIL BENDER FOR HEAVY RAILS. THE COMPANY USES A LIGHTER TYPE FOR RAILS UP TO 75 LB. PER YARD

TRACKWORK DONE 1919–1920

	1919	1920	Total
Track relaid (feet)	63,560	155,121	218,681
Track overhauled (feet)	*423,520	*472,469	*895,998
Ties installed	98,273	105,252	203,525
Joints Lorain welded	2,333	6,978	9,311
Joints Lincoln welded	306	6,590	6,896
Joints thermit welded	112	1,658	1,770
Joints having new angle bars	No report	1,348	1,348
Joints having surface bends removed	None	10,777	10,777
Joints surface welded	No report	11,475	11,475
Joints bonded	12,771	21,311	34,082
Pieces special work put in	129	479	608

*This figure is larger than it otherwise would be owing to the fact that during part of the time covered some of the reports covered track on which minor repairs only were made.

The cost of the work done during seven months of 1919 was $760,000 and during the active year of 1920 was $1,600,000. This latter sum amounts to $2,353 per mile of track.

WELDING JOINTS

The program of the company for 1921 provides for the welding of from 20,000 to 30,000 joints. As in 1920, thermit welding will be used on all new 9-in. and 7-in. girder rails and arc welding on 9-in. and on 60-lb., 70-lb. and 75-lb. T-rails where the lines are to be overhauled and the joints are not beyond the repairing stage. Arc welding will also be used on new and relaying 60-lb. and 75-lb. T-rails. This means that much arc welding will be employed.

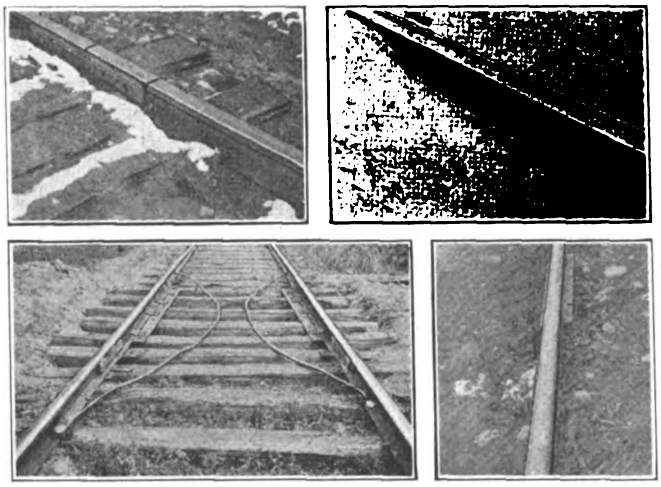
Where old track is being rehabilitated and the angle plates are badly worn the process followed is to put on new plates, if any are available, many sections being obsolete, or to put the old plates on upside down. The bolts are then tightened and if the point is low the ends of the rails are bent up about ¼ in. to ½ in. above the level. The bolts are then again tightened and the plates are then seam-welded in position. If the angle plates have been reversed the flange of the one on the inside of the track is then cut off with a torch. No effort is made to cut off the flange on the outside of the track. With a 9-in. girder rail, where it is difficult to get at the top of the plate underneath the tram of the rail, slots are cut in the tram with an acetylene torch to provide access to the top of the plate for welding. An accompanying photograph shows a 75-lb. T-rail with reverse angle plate welded, one side cut off and the other side not cut off. A second photograph shows a 9-in. girder rail with the slots mentioned cut in the tram.

Up to the present the company has been doing its arc welding with a carbon pencil with the rail as the positive pole, the theory being that no carbon can be drawn into the rail by the passage of the current. The company will experiment this year with a metallic pencil and with welds made in a variety of ways to determine which is best.

Practically all joints are now made by welding, even joints in exposed track. Where the track is entirely exposed expansion joints are put at the end of each curve and every 750 ft. on tangents. It is not expected, however, that these joints will relieve all stresses and strains in the track, as the extent to which the rails will slide over the ties and adjust themselves to expansion and contraction depends upon many causes, including the extent of corrosion between the spikehead and the base of the rail. About 4 miles of open track was welded by the Lorain process last year, and during the winter the breakages did not exceed 2 per cent. These breaks always occurred at the end of the angle or welding bar. An essential feature of the success of track welding consists in having the parts sand blasted or otherwise thoroughly cleaned just before welding. After the welding is done the joint is smoothed down by a grinder.

RAIL BENDERS

A brief description was given in the paper of Mr. Walker before the New England Street Railway Club on Dec. 2 of the home-made vertical rail benders used on the property. There are two types of these benders: One for 9-in. rail is made up of a 15-in. I-beam and one for T-rails up to 75 lb. made up of a 9-in. girder rail. A drawing of the former is shown. The bender of lighter design is very similar to the other except that it is made up of an old piece of 9-in. rail instead of a 15-in. I-beam. The drawing shows a yoke to go over the top of the bender and under the rail joint, though a chain for this purpose is sometimes used, as in the photograph accompanying Mr. Walker's paper in the issue of Dec. 2, 1920. The yokes are considered better, but trackmen sometimes mislay them and will then use anything handy, as a chain. The jacks used with these benders where a 9-in. 104-lb. girder rail is to be bent are of 30 tons capacity. For lighter rails jacks of less capacity are used.



REPAIRING TRACK IN MASSACHUSETTS
Typical break in arc-welded joint. Slots in tram head of 9-in. girder rail to facilitate joint welding. Expansion joint used with Lorain-welded joints on exposed track. Seam-welded plates reversed on 75-lb. rail.

The operation requires two men and the time taken is about ten minutes from the time that the jack and the bender are moved from one joint to the time they are ready to move to another. The general procedure is about as follows:

The ballast at the joint to be bent is opened up, after which any badly worn plates or bolts are replaced, then the bolts are pulled up tight. The yoke is then placed around the bottom of the plate at the center of the joint and the joint is raised from ¼ in. to ½ in. higher than the general rail surface, the height depending on the sag of the old bend at the joint. Before the jack is released the joint and adjacent ties are tamped.

With the length of bender illustrated it was found that the bending took place not only between the two bender supports but that the rail for several feet away from the bender support was raised. This was considered satisfactory as the deflection is usually 5 or 6 ft. back in each direction from the joint, although the extent of this deflection is not always apparent. Where the bend to be removed is very short an especially short bender is used. It was found also that the splice bars were bent up as well as the rails. Sometimes after these rebent joints had been under service for several days they sagged back, but in that case they were again set up.

Trackmen were instructed to see that the jacks had a firm position, because if they slipped out during the bending process the kick-back would be liable to hurt the men. The Eastern Massachusetts Company has had no injuries from this cause, but other roads have. The use of this rail bender ahead of the Lorain welder on badly surface bent 9-in. girder and light T-rail has also been found to help materially.

The rehabilitation work of the company during the past two years is based on the extended use on the system of one-man cars. In fact, the company is working rapidly toward 100 per cent one-man operation, and it is believed that a lighter track is possible than would otherwise be required. The abandonment by the company last year of freight service helps to make a light track adequate for the service operated.

Changes in Retail Prices of Food in the United States

THE retail food index issued by the United States Department of Labor through the Bureau of Labor Statistics shows that there was a decline of 1 per cent in the retail cost of food to the average family in March as compared with February.

Prices of forty-three food articles are reported to the Bureau of Labor Statistics each month by retail dealers in fifty-one important cities. From these prices average prices are made for each article. These average prices are then weighted according to the quantity of each article consumed in the average workingman's family. From January, 1913, to December, 1920, twenty-two articles of food were used in this index, but from January, 1921, forty-three articles are included in the index number.

For the year period March 15, 1920, to March 15, 1921, the percentage decrease in all articles of food combined was 22 per cent. For the eight-year period, March 15, 1913, to March 15, 1921, the percentage increase in all articles of food, combined, was 61 per cent.

The weighted index number of wholesale prices compiled by the department through the Bureau of Labor Statistics, and in computing which due allowance is made for the relative importance of the different commodities, stands at 162 for March, compared with 167 for February and 177 for January of the present year. The March figure is 36 per cent below that of March, 1920, and over 40 per cent below the high peak of last May. The base used in computing these index numbers is the average for the calendar year 1913.

New York Transit Reviewed*

The City Securities Which Were Issued for the Original Subway Are Shown to Have Been Self-Supporting Until Contracts for the New Lines Were Signed—Later Franchises Are Discussed — The Services of the New Commission Should Be Very Helpful

By HERMAN A. METZ
Former Comptroller City of New York

IN CONSIDERING the rapid transit question we have to go back to certain fundamentals and understand just what the city can do and cannot do in regard to its transportation question. I believe in home rule as much as any one, but sometimes the home rule principle falls down. The whole history of rapid transit legislation shows that the home rule principle was never considered to any great extent.

Under the original rapid transit act the Legislature created a commission consisting of seven members, five of them former presidents of the Chamber of Commerce of the State of New York, with the Mayor or Comptroller ex-officio members. This body was self-perpetuating. As vacancies occurred, other past-presidents of the Chamber of Commerce were nominated for membership. The city authorities; that is to say, the Board of Estimate, had the power to approve the routes laid out by this commission, pay them the salaries and vote the money for the building of the roads.

This was the commission that laid out the first subway, and after it had been authorized none of the people then interested in railroads in New York would even touch it. It remained for August Belmont to take a chance and equip and operate it under Contract No. 1, which specified that the operating company was to pay the interest and sinking fund on the city's investment of about $45,000,000, so that in reality this subway did not cost the city one cent and the bonds became self-sustaining the moment they were issued.

The contract turned out to be a good one for Mr. Belmont's company, and of course, as usual, agitators began to decry the profits the company was making and demand the abrogation of the contract and do all kinds of things to take it away from the Interborough. If it had been the other way and the Interborough had lost money, no doubt the same people would have chuckled with glee at the prospect of a corporation getting "stuck."

The old commission, however, was a very conservative one, and when the agitation arose for the Fourth Avenue Subway in Brooklyn it refused to sanction the route, although Mr. Belmont personally told me when I was Comptroller he would be willing to undertake the equipment and operation of the Fourth Avenue Subway clear to Coney Island on the same terms as Contract No. 1, and have it connect with the then existing subway for a 5-cent fare over the entire line. Conditions at the Brooklyn Bridge at that time, of course, were abominable and something had to be done. The Hughes-Hearst campaign for the governorship was on and the issue of municipal construction and operation became an important one. Mr. Hughes declared that if elected he would particularly see to it that the conditions on the Brooklyn Bridge were remedied and a new Rapid Transit Commission would be appointed which would handle the question of further facilities fearlessly and promptly. He was elected and redeemed his pledge by fathering the public service commission act and appointing the original Public Service Commission for the First District.

CITY DEMANDS MORE SUBWAYS

This commission immediately took up the Fourth Avenue Subway question, laid out a four-track route, but changed the original route from connecting with the then existing subway to one terminating at the Bowery and Canal Street over the Manhattan Bridge. I took the stand at that time, as Comptroller, when the contract for the first four sections amounting to $18,500,000 was to be approved, that the borrowing capacity of the city did not allow the certification of those contracts. But despite the question of the debt limit or the cost, and the fact that we were building only part of a subway, the final cost of which we had no knowledge, public clamor was so great that the Board of Estimate, as then constituted, would have approved the route and voted the money for the first six sections if I had not enjoined them by court action in a taxpayer's suit to ascertain what the debt limit was.

Under our Constitution New York can issue bonds only up to 10 per cent of the assessed value of its taxable property. This means, of course, that none of the property belonging to the city, state or the federal government can be taxed or assessed for tax purposes, neither can churches, hospitals or charitable institutions be taxed. It was customary whenever the city reached its margin or thereabouts to raise the assessed valuation of property, thus enlarging the borrowing capacity, and religiously see to it that every dollar of such increased margin was appropriated and disposed of within the year.

The courts sustained my contention as to what constituted municipal debt, my chief point having been that authorizations for improvements which had been voted should be considered in ascertaining the borrowing margin. At the time I brought the suit the city of New York had more than one hundred million dollars in authorizations outstanding, every dollar of which could have become debt the moment the borough president or heads of departments for whom the authorizations had been made should advertise and sign the contracts. Up to that time, however, these authorizations had never been considered, and the fact that they were outstanding was a menace which might at any time seriously involve the legality of bonds issued to pay the cost of such improvements.

SELF-SUPPORTING SUBWAY BONDS EXEMPTED

We had exempted from the debt margin bonds issued for water supply, and we had in 1907 and 1908 $45,000,000 of corporate stock (or city bonds) outstanding for the then existing subways, which were then self-sustaining. We also had about $50,000,000 worth of corporate stock outstanding for docks, which were more than earning the interest and sinking fund upon them. I sent a bill to Albany at the time allowing the city to exempt from its debt margin self-supporting bonds issued for subways or docks, expecting in this way to have released for further construction of subways $45,000,000 and for docks about $50,000,000. When the bill came back from Albany approved, it stipulated that the money could be used for docks and subways, with the result that eventually most of it was used for subways.

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*Abstract of address presented to New York Electrical League, New York, April 13, 1921.

Up to that time, while not openly a political matter, politics was played by the Public Service Commission against the Board of Estimate, and during the existence of the injunction not a thing was done by the Public Service Commission so far as bringing anything else but the Fourth Avenue Subway forward, although the increase in assessed valuations had raised our borrowing capacity sufficiently to do work in other directions.

DUAL SUBWAY PLAN AUTHORIZED

In the following election Mayor Gaynor and a fusion Board of Estimate, composed of Messrs. Mitchell, Prendergast and McAneny, were elected on a platform providing for municipal construction and operation of subways and attacks upon the then existing traction companies, the I. R. T. and the B. R. T. But during the life of that board the dual subway contracts were authorized and put into force by which the B. R. T. secured the operation of the Fourth Avenue Subway and extension of that subway up Broadway and into Queens, and the Interborough extension, out to East New York through Eastern Parkway, and the Bronx extension on Jerome Avenue and White Plains Avenue to the Mount Vernon line. Under the terms of these contracts, instead of carrying the interest and sinking fund charges, the companies were relieved of those expenses until they themselves earned a specified return upon their investment, and the city contributed what it had previously received from the Interborough as a preferential toward such earnings. In other words, the city has not since then received one cent, either for interest or for sinking fund, upon the $250,000,000 now invested in the subway system, and will not receive one cent until the companies receive the return provided for in the contracts upon their own invested private capital. Apparently that condition will never arise under contracts with which matters have been complicated.

We, as taxpayers, therefore, are paying into the budget every year for the debt service the amount of interest and sinking fund which should be paid by those using the subway. Our debt service today amounts to about $70,000,000 per year, and although the Constitution provides that the taxes for budgetary purposes; that is, the running expenses of the city, shall not exceed 2 per cent, the debt service is outside of that 2 per cent and may go on rising year after year. We are now on an average rate of 2.80 per cent for the various boroughs for this year, and the Board of Estimate was compelled to cut out of its estimates about $25,000,000 from the Board of Education allotment to keep within the constitutional 2 per cent limit.

In the meantime a 5-cent fare all over the city sounds good, but even with the dual system a passenger has to pay two fares if he goes from South Brooklyn above Forty-second or Fifty-seventh Street in Manhattan, and if by any chance he wants to go across town anywhere in any of the boroughs and needs to take more than one subway or trolley line he has to pay 5 cents each time he gets on a car or even into one of the Hylan buses. A 5-cent fare is a good thing if there is something to ride on, but where the trolley lines have stopped the public is walking.

During Governor Smith's administration attacks were made upon the Public Service Commission, with the result that the law was again changed and we had a double-headed body consisting of the Public Service Commissioner and the Transit Construction Commissioner, with the Board of Estimate having authority to pass upon routes and vote or deny the necessary funds, but with no power to do anything except make faces at the transit company or the receivers, who in the meantime had been appointed by the courts. Something had to be done to lodge authority somewhere to change the situation. The Board of Estimate takes the stand that if the companies cannot run for 5 cents they should lie down and the city will run the subways. Possibly the subways could be run for 5 cents and at a profit, but if everything else in town stopped, and the subways are now saturated to the limit during all hours, how and where would people find transportation facilities?

FACTS NECESSARY BEFORE SOLUTION IS POSSIBLE

The only way to solve the problem is to come to a showdown as to just what conditions are and what the cost of operation really amounts to, and the new law creates a commission with power to find out. Undoubtedly the railroad companies have been guilty of all kinds of high finance, and franchises obtained from the city for little or nothing have been manipulated and sold and watered stock issued against them, and leases and contracts with defunct companies are no doubt carried as assets and interest upon them is being charged against operating expenses. These should be wiped out. A franchise on which nothing can be earned is of no value, and bonds issued against such franchises are worth nothing at the present time, and this commission can find out how many such there are.

On the other hand, there is some real money in these corporations, and whatever value their stock has, be it ever so small, should and must be protected and cannot be wiped out entirely by a policy of confiscation. With a clean slate and the real value of properties ascertained, it may well be possible that a method can be evolved by which a 5-cent fare can be maintained and a profit made. But whether this is so or not, the people of New York will be entirely willing to pay for what they get, if they know what it costs, and if as taxpayers we are going to pay for the shortages, we ought to do it as a budget charge and not out of the debt service. This is simply a subterfuge which enables us to exceed the 2 per cent limitation for budget purposes.

The new commission has the power to ascertain the facts necessary for a basis on which to settle the question in the interest of all concerned, and to take the problem out of politics, so that future municipal elections at least will not be influenced by a feeling for or against public corporations, which are and must continue to be under State supervision and control. Until the bonds now outstanding become self-supporting and can carry themselves, the city will not have the means to take over existing transit lines or materially to extend present city-owned subways, and private capital will not unless guaranteed a safe and fair return. Unless, therefore, some means of carrying out either one or the other of these two alternatives is found, stagnation will continue and chaos result.

Turbine Oil Purification

The Continuous Filtration System, Which Retains the Original Lubricating Value of the Oil Almost Indefinitely, Has Practically Superseded Other Purification Methods

IN A RECENT article* Charles H. Bromley enumerates the severe conditions in steam turbine bearings that had to be contended with in the realization of a satisfactory system of lubrication. No satisfactory lubricant has been found which will not deteriorate under continuous use without purification. However, the problem of continuously maintaining the lubricating oil in first-class condition is limited principally to keeping it clean and dissipating the heat which it absorbs. The temperature of the oil in turbine bearings sometimes reaches 180 deg. Fahr., but the normal operating temperature is about 130 deg. This high operating temperature does not present any particular difficulty, for it is merely a matter either of increasing the rate of circulation or of installing more capacity in cooling coils.

On the other hand the problem of keeping the oil clean is most difficult, but its solution eliminates one of the most vulnerable features of turbine operation. One of the troubles encountered in an oil circulating system is that the rapid circulation of from seven to forty times per hour does not give the oil an opportunity to precipitate any moisture or foreign matter picked up in its circulation, nor does it permit the elimination of air or moisture which may have found its way into the oil.

The combination of water, air and heat and the rapid circulation of oil cause it to oxidize and readily form an emulsion, in which a brownish or light chocolate colored sediment is produced. Most of this remains in suspension in the oil if not continuously removed. Emulsion increases at an accelerated rate once a small amount has accumulated. If the oil receives no treatment at all, after a certain time its lubricating qualities disappear entirely. By adding "make-up" oil or "sweetening" oil, this period is only slightly increased, since the impurities, emulsions, sludge, etc., are not removed, but merely diluted.

The "batch" system is an improvement over those already mentioned, for the entire oil charge of the lubricating system is drained at definite intervals and if necessary a fresh supply of clean oil is introduced. The used oil is submitted to a filtration and purification process in which heating of the oil to a high temperature, precipitation and chemical treatments must be resorted to. Since the oil is renovated after it has reached a predetermined state of deterioration by draining the entire system, it becomes necessary to shut down the turbine units each time the oil is changed.

The continuous filtration system, which is almost universally used now, depends for its effectiveness upon continuously removing the moisture and other impurities which cause emulsification and sludge and deteriorate the lubricating value of the oil. Emulsion cannot take place if the impurities which cause it are removed as fast as they occur and will not form as the emulsion builds up.

In this system the oil leaving the bearings is filtered before it is returned to the turbine oil reservoir and is most positive and effective in maintaining the quality of the oil. Due to the small loss, oil of the very highest grade and type can be used economically. The oil becomes an investment rather than an expense.

The continuous by-pass system is extremely simple. It consists of a gravity oil filter and an oil pump. With proper oil and a clean circulating system there is no deterioration of the oil, because the circulation is so rapid keeping impurities in suspension; purification of the whole oil charge is so frequent that no sludge or muck accumulate, all the oil in the system passing through the filter every hour.

The process of purification is accomplished both by precipitation and filtration through closely woven cloth. By the former process oil is brought practically to rest and entrained water and heavy particles of foreign matter are allowed to settle out. The remaining impurities are then removed as the oil passes through the cloth filtering elements.

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*See *General Electric Review*, May, 1921. Mr. Bromley was formerly a member of the editorial staff of *Power*.

Train Operation in Kansas City

Kansas City Railways Is Experimenting with a Multiple-Unit Train Having Several Features Contributing to a Quick-Loading Scheme as a Rush-Hour Service Adjunct

WITH the idea in mind of being able to move rapidly a large number of people during the peak-load hours, provided ample provisions were made for quick loading, the officials of the Kansas City (Mo.) Railways have equipped experimentally a two-car train with multiple-unit control and other interesting features. To try out the experiment two old cars which had formerly been equipped with type M control were connected together with a control jumper and bus-line jumper so that the train could be operated with one trolley. Doors were installed on the front and rear platforms of both cars and arranged for air operation. The rear doors were arranged so that they could be opened from the street by a street collector. The platforms of these cars were rather short and consequently it was impossible to make the doors as wide as was desired, but by constructing them with two panels and by various experimenting they were made fairly satisfactory.

An arrangement was also worked out whereby the brakes are released as the doors close. A buzzer system whereby the conductor on the rear car can signal the crew on the first car was installed, the buttons for passengers not being connected through between the two cars. The compressors on the two cars were tied together electrically so that both start simultaneously whenever either governor cuts in. This arrangement was made in order to keep both compressors working if the adjustments of the governors were different.

Some difficulty was at first experienced in securing the proper operation of the electric switches located at numerous points over the system. This difficulty developed from the fact that both cars were taking energy from one trolley, so that the added load of the compressor, heaters and lights of the second car caused the switches to take the power-on position when the controller was in the off position. This was overcome by placing the heater switch for one car where the motorman could cut out the heaters when operating the electric switches.

The train has been operated with a crew of three men, a motorman and conductor on the first car and a conductor on the front end of the rear car. When the train passes through the congested district in the rush hour a street collector opens the rear door of the rear car from the street and collects fares from passengers boarding there. An additional street collector takes his position at the front door of the front car, so that the train is loaded through four doors at the same time. A further development in this connection, looking toward better efficiency, is contemplated.

This train has now been in operation for a number of weeks, with the result that it is felt that the idea is practical and capable of development. In speaking of this experiment Henry S. Day, equipment engineer, said: "We are taking our time in studying the operation of this train, and if we decide eventually to equip a number of trains for this service we shall equip them with a modern type of multiple-unit control and further develop the idea of rapid loading, which is, of course, absolutely necessary when a unit of this type is to be run on a line with single cars. We are now operating this equipment in the manner indicated and running on time, and I believe we can very much improve a good many features of the train as it now stands."

If the plan is carried out the multiple-unit control will probably be installed on some of the heavier types of cars owned by the company, which are not now run except in the rush hours. These cars can be utilized for rush-hour service and permitted to stand idle during the remainder of the day satisfactorily, for operation of these heavy cars during light-loading periods is of course very uneconomical, particularly in Kansas City, where there are many grades, some excessive, on all of the lines.

To Honor British Engineers

THE organized engineers of America will send a mission to London this summer to express the obligation which the world owes to the engineers of Great Britain for the part they played in winning the war. This mission, consisting of nationally known engineers and representing the so-called Founder Societies, will also make the award of the John Fritz medal to Sir Robert Hadfield at the opening meeting of the British Institution of Civil Engineers on June 29. The inability of Sir Robert to come to the United States to receive the medal moved the trustees of the John Fritz Medal Board of Award to make the ceremony of presentation in England the occasion for an international expression of appreciation by the engineers of the United States to the engineers of Great Britain.

The deputation to England will consist of Charles T. Main of Boston, representing the American Society of Civil Engineers; Colonel Arthur F. Dwight of New York, the American Institute of Mining and Metallurgical Engineers; Ambrose Swasey of Cleveland, the Joint Fritz Medal Board of Award and the American Society of Mechanical Engineers, and Dr. F. B. Jewett of New York, the American Institute of Electrical Engineers. Dr. Ira M. Hollis, president Worcester Polytechnic Institute and past-president American Society of Mechanical Engineers, will accompany the deputation and bear the message from the American engineers.

The adjustable seats for motormen on the Berlin street railways are fitted with an arm attached to the main support of the seat and about one-third of the way down. This arm passes between the legs of the motorman at about the height of his knees and helps to steady the seat when it is in use.

Two Years of Service

How the Illinois Committee on Public Utility Information Has Helped the Utilities of that State—Its Help Sought from All Parts of Country

THE Illinois Committee on Public Utility Information is two years old this month. It celebrates its second anniversary by passing the 5,000,000 mark in pieces of literature distributed. Its work has been so successful that similar bodies have been organized in nine other states—Indiana, Kentucky, Ohio, Nebraska, Missouri, Oklahoma, Arkansas, Wisconsin and Michigan—and its help is constantly sought, from all parts of the country, by newspapers wanting data pertinent to current news, by high school and college students facing a debate or a thesis, by lecturers wanting to freshen up platform material, by writers of circular, publicity and advertising matter for investment houses and so on.

Samuel Insull of the Commonwealth Edison Company is largely responsible for the organization of the committee. He conceived the general scheme and with the co-operation of both Bell and independent telephone interests the original membership of the committee in April, 1919, came to be as follows: John F. Gilchrist, vice-president Commonwealth Edison Company, chairman; Martin J. Insull, vice-president Middle West Utilities Company; Charles A. Munroe, vice-president Public Service Company of Northern Illinois and People's Gas Light & Coke Company (now president of American Gas Association); Britton I. Budd, president Chicago Elevated Railways; Bernard J. Mullaney, manager Public Relations Department, People's Gas Light & Coke Company; Clifford Arrick, publicity manager Chicago (now Illinois Bell) Telephone Company; W. S. Vivian, secretary-treasurer United States Independent Telephone Association.

The result is practically every electric, gas, electric railway and telephone company in the state is now co-operating and is represented on the (enlarged) committee through members designated by the state electric, gas, electric railway and telephone associations. The committee's work was organized and is still guided by Mr. Mullaney as director and H. M. Lytle, former financial editor of the Chicago *Record-Herald*, as associate director.

Out of the experience of all concerned in this Illinois campaign have come certain definite conclusions in relation to work of this character, among them the following:

Two important factors in the committee's success have been: (1) The careful way in which its work is done so that no accusation may lie against it of trying to mislead the public, and (2) the motive power supplied by the weekly meetings of the committee and the facilities of the committee members for getting close to local managers and spurring them to co-operative action.

This proximity and local contact are essentials usually lacking in educational campaigns of national scope, when directed from one central point. The Red Cross, the Liberty Loan, the Salvation Army and other war organizations found they could not get publicity results by operating nationally; they had to organize regionally by states and by communities. The Illinois plan establishes this local contact and, when adopted in every state, provides the machinery for giving national scope and effect to any kind of utility campaign, whether general or special.

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

Safety Car Boosting in Los Angeles

An Illuminated Map Is Used in Conjunction with a Chart to Show the Development of Safety Car Operation Throughout the United States

ILLUSTRATING the number of safety cars in the United States and the growth in orders from 1915 to 1920, an illuminated map, which was exhibited by the Westinghouse Electric & Manufacturing Company at the Atlantic City convention of the American Electric Railway Association, is being displayed by the Los Angeles (Cal.) Railway. The map has been mounted in the lobby of the main offices and has attracted widespread attention.

The map measures 7 ft. x 11 ft. and shows every city that operates safety cars. With the map is a chart showing the curve of orders from two cars in 1915 to 2,100 in 1920, with a total of approximately 4,400. As the first lights appear on the chart, corresponding lights appear on the map showing the cities in which the early deliveries were made. This scheme of corresponding lights on the chart and the map continues until the entire map is illuminated.

The number of safety cars in each city is indicated by the color of the light. A white light shows fewer than twenty-five safety cars; blue from twenty-five to forty-nine; green, from forty-nine to ninety-nine, and red for more than 100.

The significance of the map is explained by cards attached to it, and pictures of safety cars in operation on Los Angeles streets have been placed with the exhibit.

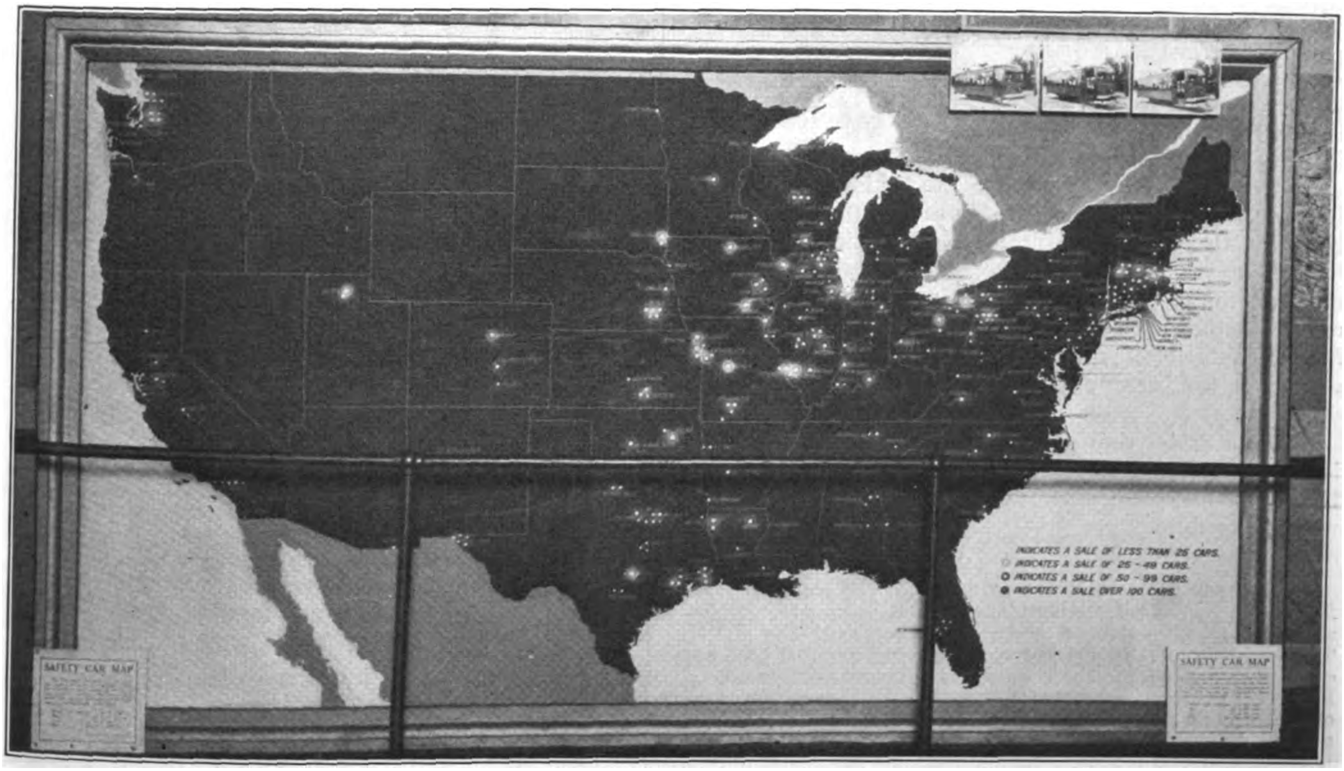
Cards in all street cars advertise the map and invite those interested in street car service to inspect the exhibit. Newspaper publicity and advertising have been utilized, particularly in community papers of the districts served by safety cars.

The exhibit was used in connection with the establishment of safety car service on two lines of the Los Angeles Railway running through the downtown district. Following the display of the map in the main offices, it is planned to place it in a store window in the main part of the city.

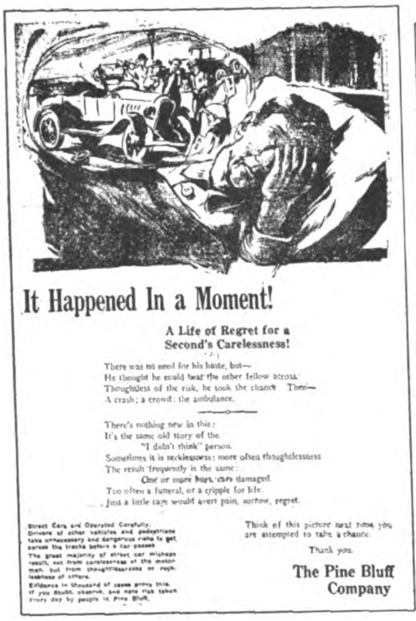
A Campaign of Instruction

THE Pine Bluff (Ark.) Company recently undertook a campaign to give the public more information about the utilities. A method was employed similar to that effectively used in the Doherty thrift campaign. The series was made up of fourteen articles, which appeared at more or less regular intervals in the local newspaper.

The aim of this publicity was merely to get the people thinking about the utilities. The first one told how dependent a community is upon the existence of the utilities and their efficient operation. The second said that the community's biggest single investment is in its utilities and that in Arkansas they pay more than one-fifth of all the state taxes. In another the fact was


INDICATES A SALE OF LESS THAN 25 CARS.
○ INDICATES A SALE OF 25 - 49 CARS.
○ INDICATES A SALE OF 50 - 99 CARS.
● INDICATES A SALE OVER 100 CARS.
SAFETY CAR MAP
SAFETY CAR MAP

ILLUMINATED KEY MAP AND CHART SHOWING THE GROWTH OF SAFETY CAR SERVICE



It Happened In a Moment!

A Life of Regret for a Second's Carelessness!

There was no need for his haste, but—
He thought he could beat the other fellow across.
Thoughtless of the risk, he took the chance. Then—
A crash; a crowd; the ambulance.

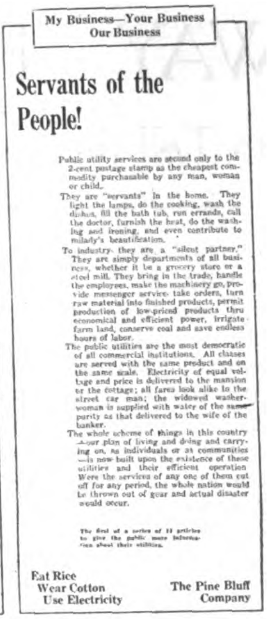
There's nothing new in this;
It's the same old story of the
"I didn't think" person.
Sometimes it is recklessness; more often thoughtlessness.
The result frequently is the same:
One or more hurt, cars damaged.
Too often a funeral, or a cripple for life.
Just a little care would avert pain, sorrow, regret.

Street Cars are Operated Carefully. Drivers of other vehicles and pedestrians take unnecessary and dangerous risks to get across the tracks before a car passes. The great majority of street car mishaps result, not from carelessness of the motorman, but from thoughtlessness or recklessness of others. Evidence in thousand of cases prove this. If you doubt, observe, and note risk taken every day by people in Pine Bluff.

Think of this picture next time you are attempted to take a chance.

Thank you.

The Pine Bluff Company



My Business—Your Business
Our Business

Servants of the People!

Public utility services are second only to the 2-cent postage stamp as the cheapest commodity purchasable by any man, woman or child.

They are "servants" in the home. They light the lamps, do the cooking, wash the dishes, fill the bath tub, run errands, call the doctor, furnish the heat, do the washing and ironing, and even contribute to milady's beautification.

To industry they are a "silent partner." They are simply departments of all business, whether it be a grocery store or a steel mill. They bring in the trade, handle the employees, make the machinery go, provide messenger service, take orders, turn raw material into finished products, permit production of low-priced products thru economical and efficient power, irrigate farm land, conserve coal and save endless hours of labor.

The public utilities are the most democratic of all commercial institutions. All classes are served with the same product and on the same scale. Electricity of equal voltage and price is delivered to the mansion or the cottage; all fares look alike to the street car man; the widowed washerwoman is supplied with water of the same purity as that delivered to the wife of the banker.

The whole scheme of things in this country—our plan of living and doing and carrying on, as individuals or as communities—is now built upon the existence of these utilities and their efficient operation. Were the services of any one of them cut off for any period, the whole nation would be thrown out of gear and actual disaster would occur.

The first of a series of 11 articles to give the public more information about their utilities.

Eat Rice
Wear Cotton
Use Electricity

The Pine Bluff Company

AT LEFT, AN ADVERTISEMENT IMPRESSING THE RESULT OF CARELESSNESS. AT RIGHT, THE FIRST ARTICLE OF THE SERIES GIVING INFORMATION ABOUT THE UTILITIES

brought out that every community is known and judged by its utilities; that where the service of utilities is not efficient, experience warrants the deduction that some influence is at work which threatens the desirability of that community as a place of residence and occupation, making it a good place in which not to invest money—a good place to stay away from. Thus, in the series of articles the facts are laid before the public in an unbiased and matter-of-fact way.

Besides this educational campaign the Pine Bluff Company has tried to promote the safety movement by the insertion in the newspapers of advertisements which bring home to the reader the penalty of carelessness and thoughtlessness. One that appeared recently is reproduced herewith.

Courtesy an Essential of Service

THE courtesy of employees on the properties managed by Britton I. Budd, the Chicago Elevated Railways, the Chicago, North Shore & Milwaukee Railroad and the Chicago & Interurban Traction Company, has frequently been the cause of complimentary comment on the part of patrons. This is particularly true of the trainmen on the North Shore Line, a fact that has undoubtedly contributed materially to the great growth in the passenger business of this high-speed interurban.

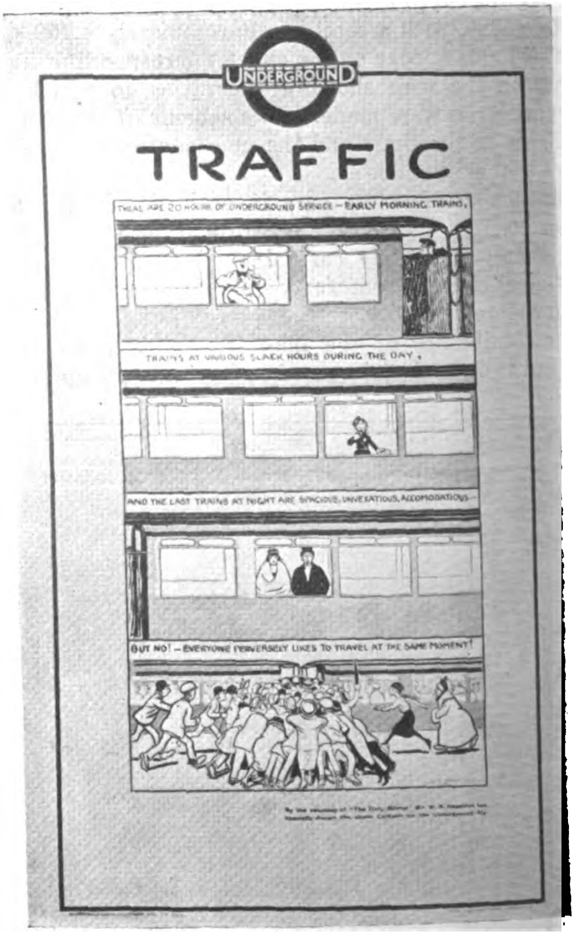
A recent letter sent out to all employees by Mr. Budd is an example of how the employees are impressed with the importance and essentiality of courtesy in dealing with the public.

The letter follows:

> It has been the established principle of the elevated lines for many years that the employees must be courteous, considerate and kindly in all of their dealings with the public. The majority of the employees have become noted and are often commended for these qualities. There are some few, however, who are an exception to the rule and there are others who do not make the effort which they should. Little attentions and courtesies make your day's work easier, cost nothing and are essential to maintaining the good opinion of the public.
>
> You are all salesmen and saleswomen, selling the only product the company has, which is transportation. If you patronize stores where you are gruffly treated or where your patronage is not welcome and you do not receive proper attention, even if it might not be termed discourteous, you transfer your patronage elsewhere. Transportation on any particular line is not compulsory and people will go where they are treated with the most consideration and obtain the best service. The attitude of the employees is one of the biggest elements in the word "service." Service performed by employees which in their relations with passengers may not be required of them very frequently offsets some inconvenience a passenger may have met.
>
> The public is well aware that the increase in fares is largely, if not wholly, due to the increase in wages which you have received. In other words, passengers are paying you your increased wages, and when they meet with discourtesy, indifference and lack of consideration, it is perfectly natural that they should resent it.
>
> Hereafter, any employee coming in contact with the public as a representative of the company, who is discourteous, indifferent or incapable of reflecting the spirit which actuates a majority of the employees, will be considered a detriment to the interests of both the employees and the company, and his or her services with the company will be dispensed with.

Lady, Lady, Shopping

(5:30 P. M. in the Evening)


UNDERGROUND
TRAFFIC
THERE ARE 20 HOURS OF UNDERGROUND SERVICE—EARLY MORNING TRAINS,
TRAINS AT VARIOUS SLACK HOURS DURING THE DAY,
AND THE LAST TRAINS AT NIGHT ARE SPACIOUS, UNVEXATIOUS, ACCOMMODATIOUS—
BUT NO!—EVERYONE PERVERSELY LIKES TO TRAVEL AT THE SAME MOMENT!

LADY, Lady, shopping—
Rather late you're stopping!
Can't you get your shopping done
Till the evening's well begun?

Lady, Lady, hunting
Half a yard of bunting—
Can't you search that bargain store
'Twixt the hours of ten and four?

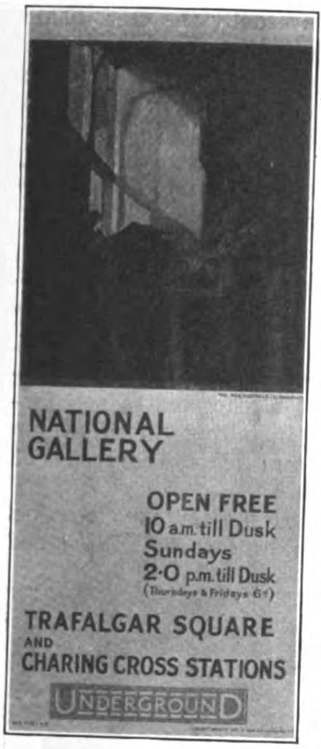
More of London's Merchandising Picture Talks

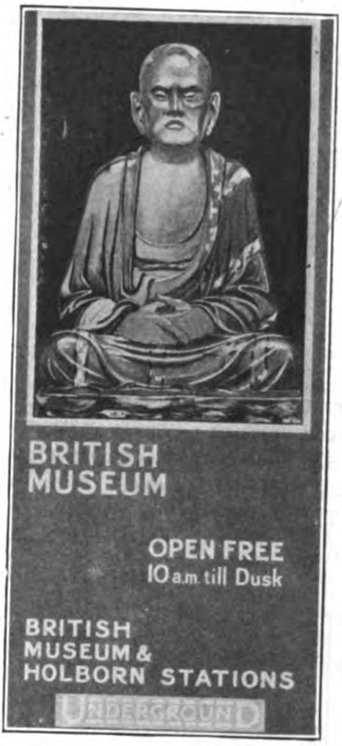
Attractive Colored Posters Used to Advertise Points of Interest Reached

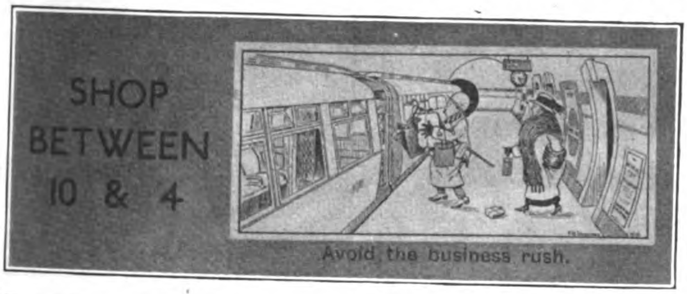
FEW ELECTRIC or steam railroads in this country carry out the transportation merchandising plan of the London Underground System. The accompanying illustrations show miniatures of some of the posters that have recently been put out to develop new traffic and to spread out the existing traffic on its lines. Some of these posters are intended for display in the stations on billboards, while those urging patrons to shop outside the rush hours are for display in the cars.

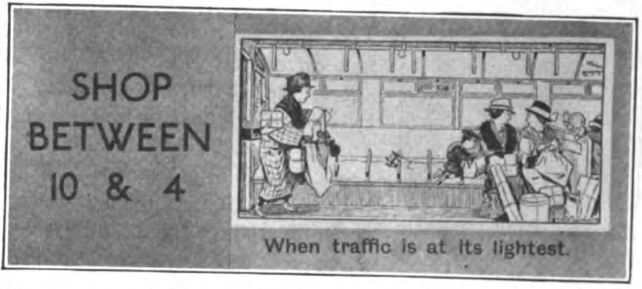
The merchandising idea of selling service is portrayed in these posters in a variety of effective appeals. Take, for instance, the zoo poster with its animal border. This creates an immediate desire to see them alive—hence a ride. The same can be said of the museum posters.

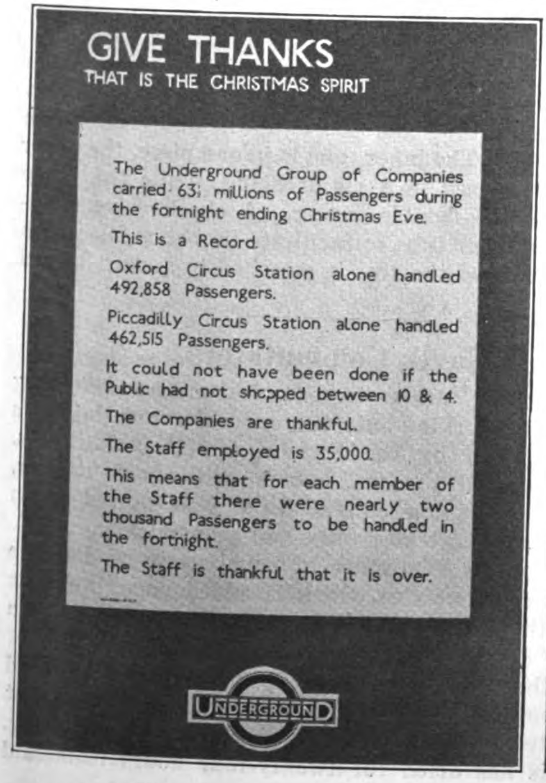
The ideas in the poster "Give Thanks" undoubtedly express the feelings of many a manager and operating man after a period of heavy traffic—but unfortunately very few if any have taken it upon themselves to capitalize the favorable feeling that the public has toward them after such a period. What a chance they have lost to hold the graces of their patrons! Traffic managers that take these ideas and apply them to local points of interest will not only be selling their own product but will be boosting the community served.


NATIONAL
GALLERY
OPEN FREE
10 a.m. till Dusk
Sundays
2·0 p.m. till Dusk
(Thursdays & Fridays 6d)
TRAFALGAR SQUARE
AND
CHARING CROSS STATIONS
UNDERGROUND


BRITISH
MUSEUM
OPEN FREE
10 a.m. till Dusk
BRITISH
MUSEUM &
HOLBORN STATIONS
UNDERGROUND


SHOP
BETWEEN
10 & 4
Avoid the business rush.


SHOP
BETWEEN
10 & 4
When traffic is at its lightest.



GIVE THANKS
THAT IS THE CHRISTMAS SPIRIT

The Underground Group of Companies carried 63½ millions of Passengers during the fortnight ending Christmas Eve.

This is a Record.

Oxford Circus Station alone handled 492,858 Passengers.

Piccadilly Circus Station alone handled 462,515 Passengers.

It could not have been done if the Public had not shopped between 10 & 4.

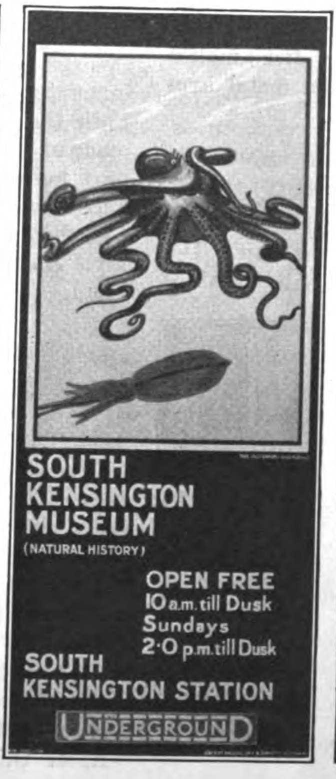
The Companies are thankful.

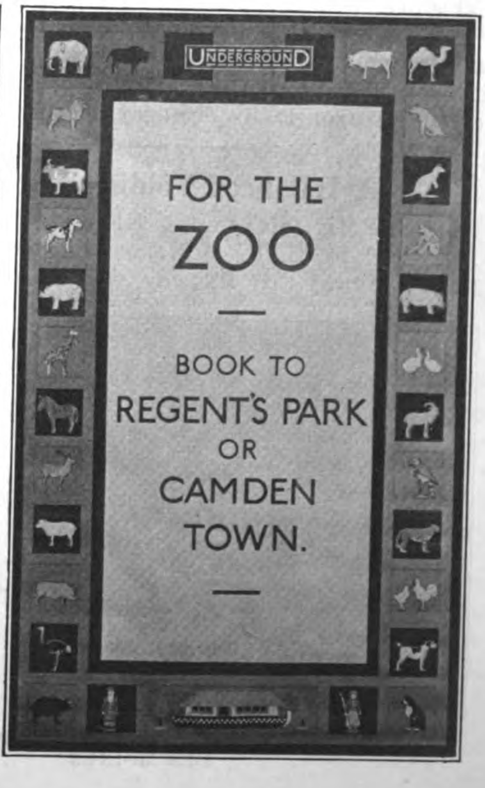
The Staff employed is 35,000.

This means that for each member of the Staff there were nearly two thousand Passengers to be handled in the fortnight.

The Staff is thankful that it is over.

UNDERGROUND


SOUTH
KENSINGTON
MUSEUM
(NATURAL HISTORY)
OPEN FREE
10 a.m. till Dusk
Sundays
2·0 p.m. till Dusk
SOUTH
KENSINGTON STATION
UNDERGROUND


UNDERGROUND
FOR THE
ZOO
BOOK TO
REGENT'S PARK
OR
CAMDEN
TOWN.

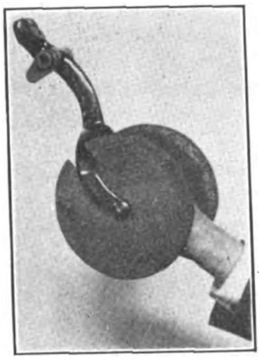
New Line of Switchboard Instruments

30
60
90
120
D.C. VOLTS

SWITCHBOARD VOLTMETER

THE Westinghouse Electric & Manufacturing Company has just placed upon the market a new line of ammeters and voltmeters for switchboard use. These instruments operate on the D'Arsonval principle and the movement, complete with the core and pole pieces assembled, can be removed as a unit, thus facilitating inspection and repairs. These instruments are designated as type SX and are finished in a dull black marine. The overall dimensions are 7 7/16 in. in diameter and 2 13/32 in. deep. The weight of each instrument is 9 lb.

Making Breaker Arms Safe

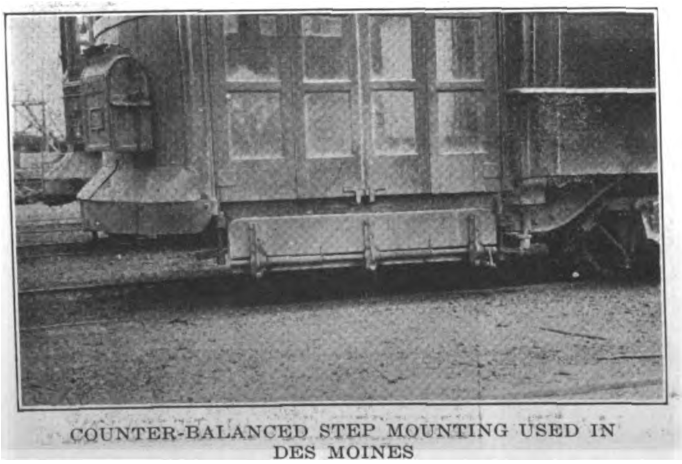


SAFETY DEVICE FOR BREAKER ARM

TO PREVENT an operator from coming in contact with the metal part of a breaker arm while taking hold of the handle, J. O. Penisten, superintendent of power distribution of the Union Traction Company of Indiana, has developed the safety device shown herewith. It consists of two large insulating disks placed at the sides of the handhold on the alternating-current circuit breaker arms of substation switchboards. As ordinarily constructed, the operator is quite liable to slide his hand over so as to come in contact with the metal arm while some part of his body is in contact with a ground. The use of these insulating disks makes it impossible for the operator to touch the metal arm of the breaker in its ordinary operation.

A Balanced Folding Car Step

A SCHEME for hanging folding steps has been devised by C. R. McMahon, master mechanic Des Moines (Iowa) City Railway, which materially lightens the labor involved in operating the step and door mechanism. The scheme consists simply of mounting the step so that the axis or hinge point is about one-third of the way out on the step board, instead of being at the inner edge of the step as is usually the case. This one-third of the step on the inside of the hanger acts as a counterbalance against the other two-thirds as the step is raised. In other words, instead of having to pull up the weight of a step 12 in. wide, the operator has only to lift the weight of an 8-in. width step, counterbalanced by the other 4 in. The step mounting is shown in an accompanying picture.

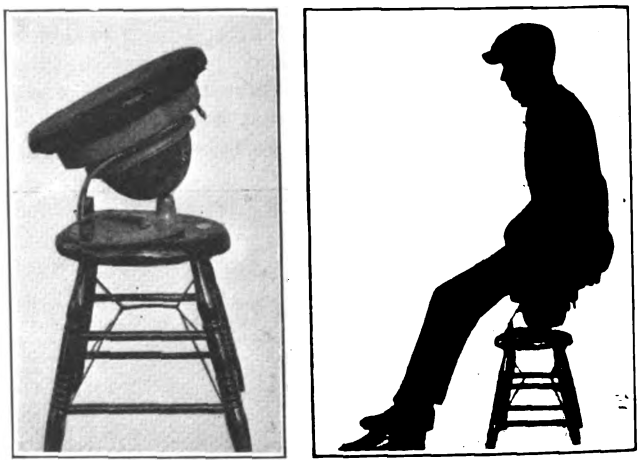


COUNTER-BALANCED STEP MOUNTING USED IN DES MOINES

Pneumatic Seat for Motormen

THE accompanying illustrations show a new type of pneumatic seat which has been in use on two cars of the San Francisco, Napa & Calistoga Railway during the past three months. It has proved so satisfactory that the company is now installing this device on the remaining cars of the system. It is the design of Henry Seibel of San Francisco.

In the construction of the seat an air cushion takes the place of steel springs, which are sometimes used, and absorbs the vibration. This air cushion consists of an inner tube, an outer flexible casing and a deformer. Both the inner tube and the outer flexible casing are made of rubber. The inner tube is in one piece, the upper part being inclosed in a rigid casing, while the lower end fits into the flexible casing. A check valve is inclosed in the inner tube to facilitate its being filled with air. As now used the seat is attached to a short-legged stool.



NEW TYPE PNEUMATIC SEAT FOR MOTORMAN

Saves Commutators

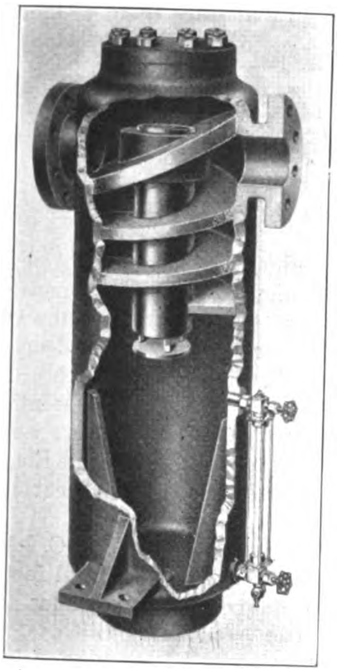
A NEW, easy and most economical means of keeping oil from working into the ends of commutators is now being used by the Pittsburgh (Pa.) Railways. After trying all the well-known methods of taping, wrapping with string, etc., a "dope" was evolved which does the work most efficiently and economically.

The "dope" is a mixture of equal parts of dextrine and plaster of paris to which is added enough shellac to make the preparation thin enough to apply with a brush.

After the mica and copper at the commutator's end are thoroughly cleaned, the "dope" is applied so that it completely covers the ends of the bars and the V-ring. After this has dried for twenty-four hours it is said to be thoroughly set and absolutely impervious to any oil which would otherwise get into the commutator. When the "dope" is put on an armature which is later dipped and baked the baking process strengthens it.

The Pittsburgh Railways says this new dope is saving money both in reduction in the number of armatures having oil in the commutator end and in the cost of trying to prevent oil from seeping in. The company is "doping" about twenty-five commutators a day. J. H. Klein is the foreman of the armature winding department, where this "dope" was evolved and is applied.

Improved Centrifugal Separator


CENTRIFUGAL SEPARATOR

THE accompanying illustration shows a redesign of the Stratton separator, which is being placed on the market by the Griscom-Russel Company, New York. In the redesign of this separator the helical path has been lengthened in order to increase the centrifugal separating action. The manufacturers claim that this feature, together with the spatter cap on the outlet pipe, greatly increases the separating efficiency. This type of separator is used for the removal of water from both steam and air systems.

Turning Car Wheels in Small Lathe

THE mechanical department of the Union Street Railway, New Bedford, Mass., has succeeded in adapting a 28-in. Manning, Maxwell & Moore lathe to the turning of all its steel car wheels which run as high as 33 in. in diameter exclusive of flanges. The company was formerly obliged to send all wheels outside for turning, the larger ones being sent to Philadelphia. This involved not only the outside charges but also freight bills and delays incident to shipping by freight. The 28-in. lathe which was already in the shop was rugged enough to handle this class of work if the diameter limitation could be overcome.

To increase the swing of the lathe three iron castings were secured and machined to fit the track on the lathe bed and were placed respectively under the headstock, tailstock and center-rest, raising the three working parts of the machine to an additional height of 4½ in., so that now the 28-in. lathe will swing a 37-in. diameter.

The wheels are not removed from the axle, the whole unit being placed in the lathe, after the rough hard surface of the wheels has been removed in the grinder to save wear on the lathe tools. A pair of dogs are attached to the faceplate at opposite sides of the center and bolted to the "near" wheel, giving a steady uniform drive free from vibration and preventing eccentricity in cutting which might result if the wheel were driven from one side only. These dogs were made by bending 1-in. x 5-in. wrought-iron bars into U-shaped fittings with lugs at the tips.

Perforating Ties to Insure Complete Impregnation

A MACHINE for perforating ties before impregnation has been developed and installed at the plant of the St. Helen Creosoting Company, St. Helen, Ore. It was designed and built by Greenlee Brothers & Company of Rockford, Ill. On page 560 of the ELECTRIC RAILWAY JOURNAL for March 19 was described a machine for puncturing the butts of poles before treatment which operated by dropping chisel-shaped bars on the pole. The perforating machine used for ties operates on a different principle. The ties are subjected on all sides to the rolling action of four toothed drums, two rotating on vertical axes and two on horizontal. The teeth are so spaced that incisions are made both across and along the grain and so that those along the longitudinal axis of the ties form diagonal lines. The diameter of all the drums is 14½ in. The speed of the machine is 70 lin.ft. per minute and it handles ties up to a maximum size of 8 x 14 in.

The lower horizontal drum and the right-hand vertical drum, looking in the direction in which the ties are fed into the machine, are located rigidly and both are driven by gearings mounted upon the side of the machine arranged to receive its power from a 15-hp. motor. The top horizontal drum and left-hand vertical drum are flexibly and adjustably mounted for variations in the tie sizes, and are furthermore provided with flexible connections which will permit of a rocking or tilting position for perforating ties of more or less irregular form. In addition to the four principal drums there is provided a counterweighted or spring-actuated pressure roll, power driven from the same motor and adjustably hinged in the front of the horizontal drum as an aid to the operator in lining up the ties against the rear fence as they are inserted in the machine, thus assuring a straight and true feed.

The two adjustably mounted drums are fitted with heavy coil springs, provided with tension adjustments arranged to give the necessary force to the drums for properly performing their perforating functions. The maximum pressure provided for in these springs amounts to 25,000 lb.

Each drum contains twenty-five toothways, arranged to carry the teeth for perforating at approximately 2-in. distances lengthwise on the timber. The teeth are placed in these toothways with spacing blocks for 1¼-in. tooth centers. The teeth are of hardened, tempered tool steel, designed to project ⅝ in. from the surface of the drum. The face of the drum is in contact with the ties as they are passed through the machine, so that the teeth penetrate into the wood the full length of their projection from the surface of the drum.

The development of this method makes it possible to treat the tie with a minimum reduction in its natural strength and durability, so that its maximum mechanical life can be obtained. Hitherto deep penetration of preservatives into the wood has been obtained only at a sacrifice of from 30 to 40 per cent of the natural strength of the wood, due to the continued subjection to the treatment at a high temperature. Under this process lower temperatures and less time for treatment are required, so that there is a reduction of not more than 8 to 10 per cent of the strength of the timber in compression perpendicular to the grain. Thus a reduction in the present loss in strength and mechanical life of treated perforated ties reaches the point where the cost of treatment is justified.

Letters to the Editors

Maintenance Cost on a Car-Weight Basis

NEW YORK, April 18, 1921.

To the Editors:

In connection with the article entitled "Why Alter the Standard Safety Car Design?" by J. C. Thirlwall, which was published in the April 16 issue of the ELECTRIC RAILWAY JOURNAL, I find the analysis of maintenance cost as affected by car weights particularly interesting. The basis for arriving at the relative values, however, is not quite clear to me. As I understand it, the author says that at least one-fourth of the cost for maintenance of way and structures and fully one-half the cost of equipment maintenance are affected by the weight and size of the car body. If you have data available that will illustrate these deductions, I should be interested in obtaining them. "ENGINEER."

[EDITORS' NOTE—The above question was referred to Mr. Thirlwall and he has furnished the reply given below.]

SCHENECTADY, N. Y., April 20, 1921.

To the Editors:

I do not suppose any two men in the country will agree on the actual effect of car weights on average equipment maintenance or track maintenance. I arrived at my figures by some such line of thought as this:

From figures I have seen it appears that of the total maintenance of way and structures about two-thirds is the actual maintenance of the roadway; that is, the money spent on renewals of rail, special trackwork and ties and in tamping up weak joints. It is of course obvious that a considerable part of the deterioration of rail and of ties is caused by weather conditions rather than the weight that passes over them, but on the other hand it is equally certain that a large part of rail wear and practically all cases of loose joints can be attributed to weight. It is also certain that, theoretically, tie spacing can be proportioned to the weight carried on any given size of rail, and many roads have taken advantage of this fact to space ties much wider apart since the introduction of lightweight city and interurban cars than they had previously done.

I, therefore, estimate that of the 65 per cent of the total which goes into track maintenance about 40 per cent is caused by weight, or approximately 25 per cent of the total.

On equipment maintenance, I figured brakeshoe and wheel wear is directly proportional to the weight carried, compressor maintenance is very nearly proportional, the gearing wear and motor bearing wear are directly dependent upon the weights moved. With any given size motor the heating increases roughly as the square of the weights handled, and, in the particular case I had in mind, we believe the maximum safe capacity of the motors has been reached with the present weight of the standard safety car and that any material increase will tend considerably to reduce the life of the motor insulation. In other words, while the 25-hp. motor can handle considerably greater weights provided the schedule speeds and number of stops are moderate, we feel that when stops run to nine or ten per mile and the maximum speed possible under these conditions is used, 16,000 lb. dead weight is about all that the motors should be called upon to handle. The heavier the car the greater becomes the burning of control fingers and of circuit breaker tips, two doors with their mechanisms obviously require more repairs than one, a greater area of body requires more paint Balancing all these points together and comparing with the relatively small proportion that are unaffected by the size and weight of the body leads me to believe that at least half of the total maintenance is affected by the body weight.

Of course, as I said before, I do not expect that all equipment engineers will agree with my estimates, but there are probably as many who will raise them as there are who will reduce them. J. C. THIRLWALL.

National Standardization Movement Deserves Support

PUBLIC SERVICE RAILWAY
CAMDEN, N. J., April 21, 1921.

To the Editors:

I note the editorial on the annual report of the American Engineering Standards Committee and the synopsis of the report, in the last issue of the ELECTRIC RAILWAY JOURNAL. As you know, the writer has been deeply interested in national standardization from the beginning of the movement, first as one of the representatives of the American Society of Civil Engineers and at present also as representative of the American Electric Railway Association on the American Engineering Standards Committee.

It seems particularly fitting that the A. E. S. C. has just at this time established itself on a substantial footing to "Americanize" our standards. There seems to be a general cognizance of the great possibilities for this work for savings of the nation's resources and industry. This is particularly apparent from the interest that is being shown by such important national bodies as the United States Chamber of Commerce, the American Association of Manufacturers and the Department of Commerce of the United States under the able leadership of Secretary Hoover. There is no doubt that a wider use of standards would stabilize both labor and capital to a great extent. Standardization would allow stocking up in dull times.

The executive committee of the American Electric Railway Association, at its last meeting, instructed all of the standing committees carefully to go over the Engineering Manual and pick out all standards that in their judgment should be submitted to the A. E. S. C. for approval. These reports will be submitted to the standards committee of the American Electric Railway Engineering Association and if approved by the executive committee will be submitted with all pertinent facts to the A. E. S. C.

One thing the American Electric Railway Engineering Association has been trying to do in the past has been to induce a wider use of the standards that it now has and that have cost the association so much time and labor. Although it is almost a crime, in these days when we are trying to increase production at a reduced price, to change a recognized standard just for some personal whim, it is not uncommon for those who have authority to this end actually to do this very thing. Those who have carried on this expensive practice in the past without proper regard to the association stamp of approval will not be so prone to do so if the particular association standard has been "Americanized" by the A. E. S. C. Besides, the manufacturers or selling companies would be in a better position to take exception to proposed changes in standard materials and specifications that would yield no apparent benefit.

It is hoped the members of the American Electric Railway Association will support the American Engineering Standards Committee to the limit and co-operate with it, which will be an action that will not only benefit a particular class, but the country and world as a whole.

MARTIN SCHREIBER,
Chairman Standards Committee,
American Electric Railway Engineering Association.

San Francisco Municipal Railway

CITY AND COUNTY OF SAN FRANCISCO
DEPARTMENT OF PUBLIC WORKS
Bureau of Engineering

April 20, 1921.

To the Editors:

In your issue of April 9, page 697, under the caption "Municipal Railway Falling Behind," by tables of computed figures an effort is made to discredit the operations of the Municipal Railways of San Francisco.

A deadly parallel is used to accomplish this purpose and an analysis of the table at the bottom of the page will show how very unfair the arrangement of this table is. The mileage of the United Railroads is 244.24, or about four times that of the Municipal Railways. You charge up to Maintenance Account for our mileage $667,506 as against $972,808 for the United Railroads and endeavor to soft-pedal this discrimination by the footnote carrying the depreciation on the United Railroads as included in the two previous accounts of Way and Structures and Equipment. This, of course, is juggling with figures and a solution in which the city must decline to acquiesce.

Substantially, to date, since the city started this enterprise there was a capital investment of $5,826,552.47. Eight hundred and ninety-nine thousand three hundred dollars of this capital has been paid back as the installment bonds matured. One million one hundred and eighty-eight thousand one hundred and fifty dollars of the earnings have been invested in making extensions and betterments to the original 45 miles of line. Cash assets in our treasury amount to $1,266,832.01, or a net earning of very nearly $3,300,000, besides paying interest on all outstanding bonds, and all accomplished since the Municipal Railways started operating, and without increasing the fare beyond 5 cents and paying $5 for eight hours' work to the carmen.

If this activity can be classified as "falling behind" we are quite willing to fall by paying our debts as bonds mature and making necessary extensions out of our earnings, which are rapidly accumulating.

Strange as it may seem this Municipal Railway has been kept out of politics and conducted on clean business principles. It is a pronounced success and has the good wishes of all the citizens of San Francisco as well as the admiration of all officials and visitors from other cities who come to see our activities.

M. M. O'SHAUGHNESSY,
City Engineer.

[In the article referred to it was not the purpose to show the results of operation or the financial condition of either the Municipal Railway or the United Railroads over the entire period of time that the Municipal Railway has been in operation. The thought was to show only the results of operation of the two systems for the year ended June 30, 1920, which was done. No attempt either was made to show or analyze the balance sheets for the two operating companies.

With regard to the depreciation item for the United Railroads, subsequent information shows that the United Lines actually added to its depreciation reserve $550,000 from its profit and loss account for the year. This undoubtedly should be added to the figure of $972,808, to give a fair comparison between the two systems. This would change the total maintenance expenses per car-mile from 3.791 to 5.941 cents, the car-hour expenses from $0.334 to $0.523. The percentage of revenues and expenses would be 16.89 and 21.86 instead of 10.78 and 15.20 respectively; the other percentages in these columns would necessarily have to be changed accordingly.—EDITORS.]

Association News

Committee on Purchases and Stores Meets

ON APRIL 22 the committee on purchases and stores of the Engineering Association held its initial meeting at association headquarters. Among those in attendance were W. H. Staub, purchasing agent United Railways & Electric Company, Baltimore, Md., chairman; J. Fleming, Capital Traction Company, Washington, D. C., and W. H. Ford, Memphis (Tenn.) Street Railway. The committee discussed many matters in general pertaining to the purchase of materials and supplies, and agreed to collaborate with the committee on stores accounting of the Accountants' Association with the object of submitting a joint report covering general subjects of stores accounting. It is the idea of this committee to include consideration of a material, classification applicable to electric railways, similar to the one recommended by the Railway Storekeepers' Association for steam road operation. The committee will also ask those interested in purchasing subjects to submit suggestions for presentation by papers and discussion in an open meeting. The committee asked that a purchases and stores department section be inaugurated in *Aera* question box.

National Electric Railway Day

THE idea of setting aside May 4 as National Electric Railway Day has met with none but favorable response. While some companies have said they could not stage a public demonstration such as a parade, all have said that the idea was to be commended and they would do whatever was possible to help in calling the attention of the developments in the electric railway industry to the public, through the display of advertising matter and local newspaper stories.

The attitude in general taken by the companies replying to President Gadsden's recent letter is reflected by such statements as "the plan has our most hearty approval and you can depend on us for a most liberal program," "we will with pleasure and enthusiasm join in the program," "we are very much interested in the program and will be pleased to get the publicity matter," "we approve of the enterprise and will give the movement our fullest support."

Among the companies that have signified their intention of participating either wholly or in part are the Connecticut Company; Charleston (S. C.) Consolidated Railway & Electric Company; Schuylkill Railway Company, Girardville, Pa.; the Shreveport (La.) Railway; Morris County (N. J.) Traction Company; Chicago, Ottawa & Peoria Railway; Springfield (Mo.) Traction Company; Eastern Pennsylvania Railways, Pottsville, Pa.; United Railways & Electric Company of Baltimore.

The New Orleans Railway & Light Company is to put on the entire program some time in June, as it could not complete its arrangements at an earlier date along the lines it desires. Efforts are being made to get the Virginia Railway & Power Company to operate if possible one of its first electric cars over the original route in Richmond.

The advertising section of the Association's Bureau of Information and Service, which has this matter in charge, has already sent a national story on the developments of the industry to all newspapers. Copies of the same story, supplemented by photographs of two old cars, for reproduction, have been sent to the electric railways. Wall cards showing the growth in car design, for display in waiting rooms and other points of congregation, as well as a leaflet for distribution have been prepared and sent to all operating companies in the country.

While only a limited supply of leaflets has been sent, the association is in a position to furnish additional copies for general distribution at actual cost upon request. These illustrated leaflets have a wide field for distribution as the pictures contained therein enable the companies to put over the idea easier than with non-illustrated reading matter.

Chamber of Commerce President Addresses Camden Section

THE regular monthly meeting of the Camden company section of the American Association was held at the Newton Avenue carhouse on April 21, with seventy-five members in attendance.

At the request of President Wallace, LeRoy A. Goodwin, president of the Chamber of Commerce, Gloucester City, and president of the Rotary Club, Camden, addressed the meeting, bringing out principally what a real organization can accomplish by co-operation. The speaker won the hearts of his hearers by making the statement that he personally was for well conducted trolley service, and positively was against the jitney business. He also suggested a loop system for Camden, whereby the citizens in new sections would have convenient transportation rather than having to walk a number of squares to the nearest car line.

In the general discussion which followed, improvement in the service was the chief topic. Some interesting matters were brought to light, chief among them being the smoking nuisance on trolley cars.

Mr. Schreiber wound up the evening talk by stating that the general public should be impartial in its judgment of the trolleys. Without such services in the various suburban towns these towns could not advance, and should a receivership for the Public Service Railway become necessary, patrons would be obliged to pay additional fares to travel to the very communities that are now covered by single fares. Mr. Schreiber also read numerous letters that he had received complimenting the railway on its good service.

Commerce Chamber Meets

THERE was a large attendance at the meetings of the United States Chamber of Commerce, held at Atlantic City this week. The first general session was on Wednesday morning. This was followed by similar sessions on Thursday morning and Friday morning and afternoon, with group meetings on the afternoons of Wednesday and Thursday. Two special topics considered by each group were taxation and tariff.

The situation of the public utilities was considered in a paper by Edward N. Hurley of Chicago, entitled "The Arrested Development of Public Utilities," scheduled for presentation at the general session on Friday morning. The report of the directors of the organization on the work of the past year also contained a reference to Referendum No. 33 on electric railways, submitted Nov. 19, 1920, with the vote recorded on each of the eight propositions presented to the membership. The report of the committee on railroads, presented before the Transportation and Communications Group, was devoted to the trunk line railroad question and did not recommend additional legislation on the railroad question at the present time. Instead, it expressed the opinion that there should be further experience under the transportation act of 1920.

Connecticut Section A. I. E. E. Organized

THE thirty-second local section of the American Institute of Electrical Engineers was formally organized at New Haven, Conn., on April 22. It will be known as the Connecticut Section. The section will include all of Connecticut, with the possible exception of the corners of the State now within the radius of the New York, Pittsfield and Providence Sections and will have meetings at various points in the state.

The principal speaker at the organization dinner was Dr. William McClellan, leading candidate for the institute presidency for the coming year. He made a plea for the recognition by the section of its duty to develop a broad engineering atmosphere as well as to discuss technical engineering problems.

Charles F. Scott, professor of electrical engineering Yale University, was elected chairman of the section, and A. E. Knowlton, electrical engineer Public Utilities Commission of Connecticut and instructor in electrical engineering Yale University, secretary-treasurer.

French Electrification Progress

THE French Commission in the United States has recently issued a statement regarding progress which is being made in adapting electric motive power to heavy railroading in France. Electrification of more than 1,800 miles of track is under way, orders having been placed for fifty new electric locomotives of a type somewhat similar to that used by the Milwaukee Railway in this country. Two hydro-electric plants are being reconstructed, each to furnish 150,000 hp. to this railway, and this work is nearly complete.

The Orleans Company and the Paris-Lyons-Mediterranean Railway are planning to electrify about the same length of track. Electric power for the former will be furnished by the waterfalls of the Upper Dordogne River, while that for the "P. L. M." will come from the falls in the French Alps. The cost of electrifying all of these roads will be at least 5,000,000,000 francs and electrification is expected to save more than 3,000,000 tons of coal per annum.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Wage Cut Rejected

Arbitration May, However, Be Resorted to in Detroit Controversy—Men Name Representative

The proposed reduction of wages suggested by the Detroit (Mich.) United Railway to become effective on May 1 has been rejected by the men. No agreement has been reached relative to arbitration. The men have, however, asked for a conference with officers of the company, with a view to discussing and considering the situation in the hope of being able to reach an understanding on the agreement covering wages and working conditions or to arrange to submit the questions to arbitration if an understanding could not be reached. A resolution passed by the men in mass meeting requested that the old contract be continued, with the wages and working conditions unchanged.

It was further resolved that should the joint committee and the officials of the company fail to reach a satisfactory settlement before May 1, 1921, the company should be notified that an arbitrary reduction in wages and change in working conditions will not be accepted.

A conference between the representatives of the union and company officials did not bring any definite results. While the company is willing to consider arbitrating the entire agreement with employees, arbitration of the wage question alone is not looked upon with favor by the company.

In a letter sent to Frank W. Brooks, president of the company, the joint committee states that there appears to be either an oversight or misunderstanding on the part of the company as to the time the present wage went into effect. While the company officials seem to be under the impression that the present wage went into effect on May 1, 1920, the men contend that the present rate did not go into effect until May 16, 1920, and that it was to be for one year.

As a basis of settlement for wages and other questions in dispute as submitted in the company's proposed agreement the committee makes the following proposition:

> That these questions should be submitted to a board of arbitration of three persons as the agreement provides and the decision of a majority of the board of arbitration to be final and binding upon both parties.
>
> That the present wage rate and working condition continue in effect until the board of arbitrators have made their award.
>
> That should the time of the board of arbitration extend beyond May 16 the arbitration board be empowered to say whether any decrease or increase which they may award shall be retroactive.
>
> That should there be an increase the company is to pay the same from May 16, 1921; if there be a decrease the decrease is to be taken from the wage of the employee from May 16, 1921, and in order to assure the company against any loss in case where an employee might leave the service of the company before the company had the opportunity to deduct any decrease the organization will place in the hands of the Peoples State Bank of Detroit, Mich., the sum of $50,000 to meet any such shortage.

For the purpose of completing and getting the arbitration board into operation the committee has named Frank D. Eaman as arbitrator for the men.

Following the conference with the men President Brooks issued a statement in which it was cited that representatives of the employees had been advised of the financial inability of the company to continue the present wartime wages on the existing rates of fare and that the necessity had been made clear for a wage readjustment on May 1 to meet existing conditions.

As to the matter of arbitration Mr. Brooks explained that the company now, as always, stood ready to submit all differences to the judgment and decision of such a board, and that if the offer the company has made is not acceptable then the company is willing to submit the entire agreement to a board of arbitration and pending the decision the rates of pay and working conditions offered by the company are to be put into effect on May 1, in accordance with the notice to the men.

Cost-Plus System Favored

The Fort Wayne Federation of Labor has expressed a preference for the cost-plus system of determining fares for the city lines in Fort Wayne and a resolution setting forth the federation's position in the matter has been presented to the City Council, as follows:

> The federation's committee appointed to investigate the railway situation has decided to ask the federation to endorse the cost-plus plan of railway operation and to ask the City Council to appoint a committee to confer with this committee to study the possibility of installing such a plan in Fort Wayne.
>
> Your committee is well aware that the company is entitled to a fair and just return on the money actually invested and no more. On the other hand, the citizens are entitled to a first-class service at as low a cost as is possible. We believe that the cost-plus plan if properly installed will meet the purposes.

In his statement giving the reasons for asking for a rehearing the city attorney alludes to the matter of maintenance.

"The city of Fort Wayne is desirous that proper service be maintained, but it believes it unjust to do an abnormal amount of maintenance work, rebuilding of lines and such in a very short time, thus taxing the present car riders more than their just burden to satisfy the desire of the present operator to get his Fort Wayne lines in the very best possible condition at the earliest possible moment."

Investigation in Boston

Outside Influence Shown to Be Negligible in Effecting Passage of Public Control Acts

The investigating committee of the Massachusetts Legislature, recently appointed to look into charges of irregularities alleged to have existed in connection with the passage of street railway legislation in 1918 and 1919, has been engaged in questioning the men who were members of the two houses during those years. The committee has appointed George S. Taft, former district attorney of Worcester County, to act as counsel. The committee itself consists of five members of the present Legislature, none of whom was connected with that body in 1918.

At present all testimony is voluntary, each former legislator being called upon to waive his immunity rights before testifying. All witnesses are duly sworn before giving testimony. Only two have so far refused to testify voluntarily.

GOVERNOR COX A WITNESS

Among those who have appeared before the committee is Channing H. Cox, now Governor of the State. Governor Cox was a prominent member of the 1918 Legislature, being speaker of the House of Representatives at that time. He upheld the street railway relief legislation as it was enacted at that time, and had no apologies to offer for it. He testified that he knew of no irregularities or improper influences exerted on legislators in behalf of the street railway bills.

There is some indication that an attempt will be made to invite Vice-President Calvin Coolidge, former Governor of Massachusetts, to come before the committee.

Several members of the former Legislature have admitted having purchased stock of the Boston Elevated and Massachusetts Electric companies, anticipating a probable rise in market value of those securities upon the passage of the public control and other favorable legislation. The ranks of the speculators included some legislators who opposed the bills and voted against them. In general they maintain that they believed they had a perfect right as individuals to do so, claiming their votes were not influenced thereby.

Each witness is first asked a series of specific questions designed to bring out whether or not any improper influence was brought to bear on him or whether any inducement was offered to secure votes in favor of the legislation. Each witness is also asked whether he bought any securities of the street railways involved, either directly themselves, or indirectly through others.

Although a few above mentioned admitted having speculated in the stock, all have denied any improper influence or inducement. Some have claimed that strong political pressure was brought to bear, and one or two have mentioned "corridor gossip" involving the possible financial advantage to be gained by speculating in the stock, but no specific names or concrete facts have been given of any irregular influences.

Following the standard interrogatories of counsel, each man is given an opportunity to make any informal statement he may desire. A number have taken the opportunity to praise the legislation, especially the Boston Elevated public control act, and have classed it as one of the most popular and cleanest pieces of corporation legislation ever passed.

The Boston daily papers, with the exception of the newly-established *Boston Telegram*, do not seem to take the present investigation very seriously. While fully reporting it in the news columns, very little editorial comment has been aroused. The Boston papers were unanimously in favor of the public control act in 1918.

Some little resentment has been aroused in banking and financial circles because of the action of the committee in sending an auditor to examine into their books and records of customers' transactions.

The committee's counsel, Mr. Taft, has given as his opinion that the Boston Elevated public control act is in the nature of a contract between the State and the Elevated Railway stockholders, and has hinted that legislators who owned stock and voted on the legislation relating to this alleged contract are liable to prosecution under the laws of the Commonwealth.

New Franchise in Effect

Details Are Reviewed of Outstanding Provisions of New Service-at-Cost Grant at Findlay

The new service-at-cost franchise for the city lines of the Toledo, Bowling Green & Southern Traction Company at Findlay, Ohio, went into effect on March 17. Fares are now 8 cents. C. E. Hart, D. Fortflowers, and M. D. Neff have been named by the City Council as the members of the first street railway commission. They will have power under the ordinance to regulate the service and determine when fare increases or decreases shall take effect under the new plan. The service and safety director of the city has since been named street railway director.

THE new service-at-cost franchise accepted on Feb. 14 by the Toledo, Bowling Green & Southern Traction Company modifies the twenty-five-year franchise in Findlay granted on Feb. 23, 1915. The franchise contains a number of interesting features.

One of these covers the appointment of the Commission of Control. This body is to consist of three members, each elected for a term of three years. The commissioners serve without pay. The Mayor transmits to the Council a list containing twice as many names as places to be filled, and from this list the Council fills the vacancies. The control of the service is in the hands of this commission except that it is not permitted to make "such requirements as will prevent the production of sufficient revenue to maintain the stablizing account."

Moreover, the commissioners have no control over temporary or emergency measures that may be taken by the company, and they work through the present city official known as the director of public service, who receives no extra compensation for the added responsibility but can employ necessary assistants at the expense of the railway.

Section 5 provides that the "traction company," which includes the interurban lines, shall pay 0.45 cents per ton car mile to the city street railway for the use of the track by the interurban passenger and freight motor cars and trailers in addition to a power charge.

Funds derived from the sale of property and not applied to the payment or retirement of outstanding bond issues may be used for extensions, betterments of permanent railway improvements, provided it is so agreed by the traction company, the trustee for the bondholders and the commission, but no additions are to be made to capital value for extensions, improvements and betterments so required. These funds may also be used for the renewal of existing equipment or property. If funds received from such a sale are not used for improvements of the property the capital value of the city street railway is to be reduced proportionately.

Section 10 provides that the value of the physical property of the city railway be set at $180,000 and on this amount the company is permitted a return of 7 per cent.

Section 11 provides for the stabilizing account which is to be $20,000, less prepaid accounts on the books of the city street railway, and this sum is recognized as part of the capitalization of the city street railway.

Section 12 provides that the traction company shall receive an allowance of 15 cents per car mile for operating expenses such as power, insurance, payment of claims, overhead expenses proportionate to the service, etc. The operating allowance is also to include not more than $400 a month to the traction company for joint services such as executive salaries and rental expense. These joint charges are not to be in excess of 12 per cent of the total operating allowance for any one month.

Section 13 provides for an additional allowance of 3½ cents per car mile exclusive of the car miles traveled by work cars for maintenance, which will be used exclusively for the upkeep of the city street railway property. In addition there is an allowance of 3 per cent of the capital value of the property (less land value and stabilizing account) for renewal and depreciation allowance. Such allowance cannot be used to make improvements which can be capitalized.

There is a sliding scale of fares, beginning at 8 cents cash, fourteen tickets for a dollar, or seven tickets for 50 cents. Increases or decreases are made according to regular schedule when the $20,000 stabilizing fund reaches $25,000 or drops to $15,000.

In case the traction company fails to carry out the conditions of the franchise after thirty days' written notice the commission can take over the street railway property and operate it until the traction company complies with the terms of the ordinance. During the time the city operates the railway all net income after paying current operating and maintenance charges are to be credited to the stabilizing account.

City Attacks New Law

An order was obtained on April 25 by the City of New York in the Supreme Court for the new Transit Commissioners of New York to show cause why they should not be restrained from entering upon their new duties and that the present Transit Construction Commissioner should show why he should not be restrained from turning over to the new body the records of the commissioner's office. The new commission in New York City has since taken charge over the protest of Rapid Transit Construction Commissioner Delaney.

Jitney Operators Arrested

The police of Albany, N. Y., under the direction of Public Safety Commissioner Frost, on April 22, started making wholesale arrests of jitney bus operators. All of those arraigned demanded jury trials, were admitted to bail and in many instances resumed operation of their cars.

The situation is a peculiar one in that Mayor Watt has recently been served with an injunction restraining the operation of jitneys in competition with the United Traction Company's cars and has made an appeal on the injunction. Corporation Counsel McManus holds the Mayor without authority to stop jitney service pending the result of the appeal, but the Commissioner of Public Safety has gone over the Mayor's head in the exercise of the police power to stop the service.

In spite of the fact the railway states the strike of its trainmen is broken Justice Hinman of the Supreme Court on April 21 ruled that the ban against picketing by former employees of the United Traction Company be continued.

For the first time since the strike began twelve weeks ago service was resumed by the United Traction Company in Rensselaer on April 22.

Interurban Announces Wage Cut

Wages of motormen and conductors employed by the Cleveland, Columbus & Southwestern Railway, an interurban road that taps territory southwest of Cleveland, are to be reduced on May 1, officials of the company have just announced.

The exact amount of the reduction has not been definitely determined but officials have stated that the financial conditions of the road makes it necessary to reduce the wages of the trainmen at least 20 per cent. This is the amount of the reduction accepted by the local Cleveland trainmen.

The wages paid by the Cleveland, Columbus & Southwestern Railway now are 55 cents an hour for first three months; 58 cents an hour for the next nine months and 60 cents an hour for all men in the service longer than one year. It is likely that the highest rate the men will receive after May 1 will be 48 cents an hour.

Changes in Proposed Florida Bill

With ten Florida cities represented by their mayor or some other high official protesting vigorously and presenting protests from fifty other communities the Railroad Commission has decided it will not press its bill for the creating of a Florida public utilities commission in its present form and that the clause giving the proposed commission control over municipally owned public utilities will be stricken from the proposed measure. The announcement was made by the commission's chairman, R. Hudson Burr, after a hearing of one hour on the bill by the Senate committee to which it had been referred by the Senate now in session at Tallahassee, Fla.

The proposed bill would create a public utilities commission to take over the duties of the present Railroad Commission and to take control of all public utilities such as electric, gas, water plants, etc. It was drawn by the Railroad Commission, presented by its attorney, who is a state Senator, and was referred to a committee of which the attorney was a member. This series of circumstances has heightened the hue and cry against the measure.

Peter O. Knight, general counsel for Stone & Webster in the Florida district, has expressed himself as follows:

> I have become convinced that regulation of public utilities has come to stay. I know when I'm licked; and if we have to have regulation the companies I represent want intelligent regulation by an efficient body that can demand and enforce its demands. We do not want picayunish political regulation as inconsistent as the wind of hot-air politicians. We want what we are entitled to and that's all. I am not particularly in favor of this bill but I am not fighting it. We are willing to accept it as preferable to political regulation, that's all.

$1,700,000 for Rapid Transit Changes in Queens

The problem of how to operate trains of the Interborough Rapid Transit Company and Brooklyn Rapid Transit Company with cars of different width over the same tracks in Queens Borough, New York City, has been solved by Transit Construction Commissioner John H. Delaney. Double rails will be laid, the Interborough using those already placed and the Brooklyn Rapid Transit trains to use those to be laid immediately. The double rails will make necessary some minor changes in equipment.

The tracks were laid by the Interborough Company, which uses cars about 12 in. narrower than those of the Brooklyn Rapid Transit Company. The Interborough refused to spend money to make changes for the accommodation of a rival, even though the contract called for dual operation. Commissioner Delaney ordered the company to make the changes and the courts were appealed to. The litigation resulted in a victory for the Interborough. Mr. Delaney on April 9 said that 16 miles of single track would be affected, and he estimated the cost of track changes at $800,000. Independent signaling and third-rail service will cost $300,000 more, and the cost of structural changes at the various stations on the new line in Queens is estimated at $600,000.

Commission's Powers Widened

Authority of Minnesota Body Extended to Electric Railway Rates, but Cities Control Service

General satisfaction exists in cities in Minnesota that have electric railways over the final passage of the amended street railway bill by the Minnesota Legislature and its signature by Governor J. A. O. Preus. The bill passed the House on April 13 by a vote of sixty-nine to fifty-seven. The amended bill passed the Senate on April 14, when the body concurred in the House amendments. It was signed by the Governor on April 16.

UNDER the new law rate control is vested in the State Railroad & Warehouse Commission with jurisdiction to the cities over routings and extensions. The commission is authorized to establish an emergency increase before a revaluation can be made and a permanent rate established.

The law settles the status of franchises soon to expire in the various cities by providing for the new indeterminate franchise method. The measure is on this account expected to stabilize business and to assist the companies in arranging new financing.

Not the least of the benefits will be to remove the question of fares from city councils and place it in the hands of a commission which is expert in the matter of rates and of valuations. However, the right of the cities to appeal to the courts under proper circumstances is reserved, as well as all local matters pertaining to new lines, etc., thus leaving intact the cities' home rule.

The railway lines in both Minneapolis and St. Paul are operating at a 6-cent fare. In Minneapolis the Twin City Rapid Transit Company already had authority to increase the fare to 7 cents, and in St. Paul to 7 cents after the Council had determined whether the railway has established service previously agreed upon as being necessary.

A summary of the provisions of the bill follows:

Section 1. Defines terms used in the bill.

Section 2. Provides that existing grants to street railways of the state and those made in the future shall be indeterminate permits—permits to do business until purchase of the property by the city or until termination or modification of these permits by the legislature. Acceptance of the indeterminate grant by companies now operating is optional, however. All terms, conditions and obligations of existing franchises are continued in force except as otherwise provided in the bill.

Section 3. Provides for purchase of the company's property by the city at a valuation fixed by the commission, whose decision in the matter is subject to appeal to the District Court of the county in which the company operates. This property may, moreover, be acquired by condemnation proceedings, or by agreement.

Section 4. Perpetuates the right of the cities to say what manner of service the street railways must furnish. This authority is made final and is not subject to appeal by the street railway.

Section 5. Grants the Railroad and Warehouse Commission authority to fix reasonable rates of fare, subject to appeal to the District Court of the county in which the company operates.

Section 6. Provides more particularly for continuous intercity passenger service, having in mind more particularly the peculiar situation which exists because of the physical proximity of Minneapolis and St. Paul.

Section 7. Provides that the company must obtain authority of the commission before it can issue stocks, bonds or other evidences of indebtedness payable at periods of more than one year, and further provides that the street railway shall not issue evidences of indebtedness when their value, together with other outstanding securities exceeds the fair value of the property. This makes watered stock impossible.

Section 8. Gives the commission authority to establish rates of fare, either on its own initiative or on the application of either the city or the street railway, and provides that such rate shall be based on a valuation of the street railway's property. This section further provides that the commission shall have access at all times to the records and accounts of the street railways.

Section 9. Authorizes the commission to determine and fix the fair value of the street railway if the petition of the city be filed with the intention of acquiring such property. If the petition be to fix a rate of fare, the commission is to allow a rate which will yield only a reasonable return on the fair value of the property.

Section 10. Provides that the city or street railway may appeal to the District Court of the county in which the street railway operates from any ruling of the commission, and that the court shall try the case *de novo*, taking into consideration any evidence offered, whether excluded by the commission or not. An appeal from the decision of the District Court may be taken to the Supreme Court.

Section 11. Provides for use of city lines by suburban railway. The compensation to be paid is to be fixed by mutual agreement if possible, subject to the approval of the Council, but in the event of the failure to agree the Council is to fix the compensation, subject to appeal to the District Court.

Section 12. Declares that no grant shall be issued to a street railway to operate in a city in which another street railway is then operating unless a certificate of convenience and necessity is first obtained from the commission after a hearing.

Section 13. Vests in the commission the authority to prescribe a system of accounting, prescribe depreciation, and control the disposition of money in the depreciation fund. This section compels the company to furnish the commission annually full financial reports, and any additional reports that the commission may request.

Section 14. Reserves to the state the right to modify, amend or repeal the act, or to cancel or modify any indeterminate permit. It prohibits the granting of an indeterminate permit to other than a Minnesota corporation.

Section 15. Repeals all legislation conflicting with the provisions of the act.

Section 16. Makes the act effective from and after its passage.

Formal acceptance of the provisions of the new law was sanctioned by the directors of the Twin City Rapid Transit Company on April 22. President Horace Lowry said:

> The board decided to accept the indeterminate permit as provided by the law, and to work under the new act. As to the service in the Twin Cities there will be no immediate effect except that we will continue our efforts to improve the service. Details of changes will have to be worked out.

In commenting on the act when it passed Mr. Lowry said:

> I am glad the Legislature has seen fit to pass a law which will strengthen the credit of street railways and will, I hope, enable our companies to obtain the funds necessary to build up and expand our system of transportation to meet the needs of these growing cities and the surrounding country.
>
> The public, however, must realize that under the act it will take the commission some little time to determine the fair value of the property and that this must be done before we can ask the investing public to lend us the money we need to do even the work and paving now ordered.
>
> The company, through its officers, during the discussion of the bill pledged itself to do its best to go forward in the public interest. The passage of this act increases the responsibility of the company to the car riding public, and at this time I wish to assure our patrons that we propose to the best of our ability in letter and spirit to live up to all that we have promised.

The exact date for filing of declarations with the city clerk is not determined. The certificates which the clerks will issue, when filed with the Secretary of State, place the companies under the indeterminate franchises provided for in the new law.

Strike Likely on Eastern Massachusetts Street Railway

Unless some unexpected eleventh hour development occurs to change their plans, the employees of the Eastern Massachusetts Street Railway are expected to go on strike on May 2. According to figures given out by the union officials, the men voted overwhelmingly against accepting either of the alternative propositions offered by the public trustees. The latter on Feb. 25 announced a 20 per cent reduction in wages, effective May 2, the union contract expiring May 1, and since then, as an alternative, have offered to arbitrate the wage question, but only on condition that an open shop policy will be followed. Neither of these was acceptable to the union.

The men are demanding arbitration on the basis of possible changes in the existing agreement. The trustees, however, in their original notice to the employees, signified their intention to cancel in its entirety the present union agreement at its expiration, May 1.

The trustees have announced that they intend to operate the road whether or not the present employees quit.

The trustees have sent announcements to the public officials and the newspapers in the various cities and towns that their intentions in reducing wages are solely along the lines of making reductions in car fares, and that the company does not expect to profit by lower wages.

Advantageous Advertising Contract

United Railways, St. Louis, Will Increase Revenue 300 per Cent Under New Arrangement

In letting a contract to the Western Advertising Company for space on and in the cars of the United Railways, St. Louis, Mo., beginning on Oct. 1, 1921, Rolla Wells, receiver, has included the dashboard space which heretofore has been reserved by the railway for civic and charity purposes, or used to stimulate travel. This increased space was a factor in the 300 per cent increase in revenue the company will gain from the new advertising contract.

$191,300 FOR TEN YEARS

The contract is for ten years at $191,300 a year. When the receiver took charge two years ago, the company was receiving $64,000 annually for advertising space. Last year this sum was raised to $80,000, under a temporary settlement effected in the United States Circuit Court. Last month, by order of the court, new bids were called for and they were opened a few days ago. There were four bids, and the minimum under the new allotment of space including dashboards was $150,000.

Separate bids for inside and outside the cars were not called for, and therefore no indication was given as to how much the bidders considered the dashboard space to be worth—two dashboards on the fronts of all the 1,500 cars operated by the company. The periods of time called for were five and ten years, and it was found that the Western Advertising Company, the highest bidder, offered $10,000 a year more for a ten-year contract than a five-year contract. The receiver accepted the ten-year agreement, $191,300 annually, and it is expected the Federal Court will approve it.

RAILWAY RESERVED LITTLE SPACE

The only space reserved by the company for its own purposes is the lightbox sign space, and on the glass of the windows when the windows are closed. The company's publicity will take some other form, and Col. A. T. Perkins, manager for the receiver, is now considering the publication and distribution of folders for car riders. It is figured that 500,000 folders can be printed and distributed every month for about 4 per cent of the increased revenue the company gets for the advertising space.

Wage Cut Demanded

Railway at Youngstown Insists Upon 25 per Cent Reduction and Changes in Working Conditions

G. T. Seely, vice-president and general manager of the Pennsylvania-Ohio Electric Company and president of the Youngstown Municipal Railway, has transmitted to the trainmen in the employ of these companies a draft of a new agreement for the ensuing year embodying a wage scale of 45 cents an hour for the first three months, 48 cents for the next nine months and 50 cents an hour thereafter, with 5 cents an hour additional for operators of one-man cars.

The present contract governing the wages and working conditions of the trainmen has been in force since April 1, 1920. It expires May 31, 1921.

TWENTY-FIVE PER CENT REDUCTION

The rates of wage paid under this contract are 60 cents an hour for the first three months of employment, 63 cents an hour for the next nine months and 68 cents an hour thereafter, and 5 cents an hour additional for operators of safety cars. By far the largest number of men come under the higher classifications. The rates of wage in the last previous contract were 43 cents an hour for the first three months, 46 cents an hour for the next nine months and 48 cents an hour thereafter. The rates in the present contract are more than 40 per cent above those specified in the last previous contract and 120 per cent greater than the rates of wage paid in 1914 prior to the beginning of the world war.

Mr. Seely explains to the men that after a year's experience with the present scale, it has been conclusively demonstrated that this rate of wage cannot be continued as the earnings are not sufficient properly to maintain the property or provide any return on the investment. Mr. Seely says that the only excuse for such an intolerable condition being permitted to exist temporarily was the excessively high cost of living in effect in April, 1920, when the last contract was negotiated. In this connection he says:

> Now that the cost of living has materially declined, this temporary situation no longer exists and the public interest requires an adjustment; and I am, therefore, taking this opportunity to inform you that this company cannot continue the present wage agreement beyond the date fixed therein, May 31, 1921, and that any new wage agreement must of necessity be much lower than the present wage in all rates.

At the same time Mr. Seely has explained that some of the working conditions under the present contract are a survival of years when different operating conditions existed and are of such a nature as to interfere with efficient operation. He says that the conditions which should be modified or eliminated are those—

1. Requiring and enforcing absolute closed shop and interfering with free selection of men.
2. Requiring all runs to be early and late—a situation which renders operation costly and inefficient.
3. Requiring unnecessary expenditures

for pilots to accompany crews already familiar with road.

4. Requiring higher rates of wages for certain work that would be largely sought by trainmen at standard rates.

5. Requiring excessive penalty payments for overtime.

6. Prohibiting operation of safety cars on lines on which special agreement has been made, thus tending to limit the company in providing adequate service to the public.

Cars Reflect Europe's Devastation

A recent traveler through after-the-war Europe has brought back to this country harrowing tales of the electric railway industry in Budapest. He says:

> As for the street cars, I never saw such woe-begone specimens as those of Budapest. They used to be brown or yellow, but now nearly every one of them is a nondescrpt blackish-gray, a color without a name. Their wheels and the rest of their machinery are so rusty that the poor cars wheeze and creak and groan as if they were about to fall to pieces any minute. Their windows won't work; the platform steps sag when one puts a foot on them. As these faded imitations of trolley cars jolt along Budapest's dirty thoroughfares they seem like mangy street curs sneaking along the gutters in search of a bone.

Some Contemporaries of the Five-Cent Fare

Nelson, Cook & Company, Baltimore, Md., in their market letter of April, comment upon the agitation for a restoration of the 5-cent fare in that city. They say:

> Now is not the time to restore the old 5-cent fare, nor would it be feasible for the city of Baltimore even if the proposition were considered a good one, to take advantage of the old agreement contained in the original franchises whereby the city has the privilege at given periods of purchasing the old City Passenger Railway lines. The return of the 5-cent carfare will be contemporaneous with the return of the 1-cent newspaper, the $4 a day mechanic, the $10 a week stenographer, and similar quotations of a former day.

News Notes

Carmen Suggest Wage Cut.—The manager of the Altoona & Logan Valley Electric Railway, Altoona, Pa., has been notified that the employees will voluntarily accept a wage reduction of 5 cents an hour beginning May 1. The scale has been 55, 57½ and 60 cents, according to length of service.

Wage Offer Rejected.—Employees of the Des Moines (Ia.) City Railway, by an overwhelming vote, have rejected the proposition submited by the company which placed the maximum wage at 60 cents. The present working agreement between the men and the company expired on March 1. If an agreement cannot be reached the wage question will be submitted to arbitration.

Plans Study of Trackless Trolley.—An investigation of the feasibility of installing the trackless trolley in Cincinnati, Ohio, was started by William C. Culkins, formerly director of street railways. Mr. Culkins said that the trackless trolley might be very useful and successful in parts of the city where extensions of the railway are really needed but where the expense of installing such railway extensions would be prohibitive.

Sioux City Men Face Wage Cut.—Sufficient revenue has not been obtained by Sioux City (Ia.) Service Company from fare granted last year to maintain the present wage scale and a readjustment has been asked. The men were granted an increase last year, making the hourly scale 50 to 60 cents with 7 cents additional per hour for operating one-man cars. It is intimated that a 10 per cent reduction will be asked.

Safety and Courtesy Win Merit.—To place special emphasis on safety and courtesy the Los Angeles (Cal.) Railway has announced a slight change in the merit system, under which credits are computed for the Christmas cash bonus. The 25 credits formerly given for a clear record for one month will be discontinued and instead, regardless of the number of demerits which a man has received for other reasons, ten credits will be given monthly to each man who maintains a clear courtesy record for one month and ten credits to each man who maintains a clear safety record for each month.

Municipalization Urged.—A large delegation from Niagara Falls, St. Catharines and other surrounding municipalities waited on J. D. Reid, Minister of Railways and Canals in the Dominion Government, recently to request the Government to acceede to the immediate purchase of the Niagara, St. Catharines & Toronto Railway by the Niagara Radial Railway Union. In reply Dr. Reid stated that it was impossible to take any action pending the report of the Royal (Sutherland) Commission appointed by the Ontario Government and which is now investigating the whole question of Hydro Radials within the province of Ontario.

No Progress Made on Toledo Agreement.—The possibility of a strike of trainmen of the Toledo Railways & Light Company, Toledo, Ohio, has been hinted by the union men, who are now working without any contract covering working conditions or wages. At the expiration of the contract nearly a month ago negotiations were begun looking toward a new agreement but no progress has been made. The company proposed a slight reduction in wages, but the men turned the contract down and have not made any compromise offer. In view of the deficits in the operation of the Community Traction system it is almost a certainty that the street railway commissioner will ask for a reduction of wages as an effort to forestall an advance in fares in August.

Nine-Cent Wage Increase Asked.—Employees of the Syracuse & Suburban Railroad, Syracuse, N. Y., which since its resumption a month ago has been operating one-man cars, have taken the initiative with respect to a contract to replace the present agreement, which expires on May 1. They have submitted a new contract calling for a wage increase from 56 cents an hour, the present scale, to 65 cents, basing their demand on the increased difficulty of operation of the one-man cars. The present contract was negotiated last May as the result of a strike. After the road suspended operation on Jan. 1 of this year General Manager Allen declared that the shut-down canceled the contract, and if the road resumed it would pay the men only 42 cents an hour, a reduction of 25 per cent. It was later decided to continue the scale in effect for two-man cars to the one-man car operators until the expiration of the contract.

Glasgow Against Underground Lines.—In reference to the great congestion of street traffic in the center of Glasgow, James Dalrymple, general manager of tramways, reported early in March to a committee of the Town Council against the construction of elevated or underground electric railways on account of the enormous capital cost and because the traffic would not yield sufficient revenue to meet the working expenses. What was needed, he said, was two additional bridges across the Clyde. The committee is recommending the construction of one of the proposed bridges with tramways on it, half the cost to be paid by the tramway department. The bridge and the necessary land are estimated to cost £840,000. For linking together outlying districts, where the present cost of tramway construction would be too high, Mr. Dalrymple favored the trackless trolley system of cars which could be worked much more cheaply than petrol motor omnibuses.

Objection Raised to Norfolk Grant.—At a recent public hearing before the City Council of Norfolk, Va., Tazewell Taylor, retained as special counsel by the Retail Merchants' Association in connection with the proposed new railway franchise for the Virginia Railway & Power Company, sharply criticised the franchise draft largely the work of A. Merritt Taylor, Philadelphia. He also entered objections to the provision for a utility board and for an 8 per cent return through a thirty-year franchise. He further attacked the idea of the city's pledging itself to renew the franchise or buy the property at the end of thirty years. Mr. Taylor believed that an examination of the company's books by the city would enable the city to fix a fare that would give a "just and fair return on the actual investment." The Norfolk Chamber of Commerce has retained Delos F. Wilcox, New York, as its adviser. A report by him on the pending franchise is expected within a few weeks.

Meeting of Association

New York Electric Railway Association

The thirty-ninth annual meeting of the New York Electric Railway Association will be held at the Fort William Henry Hotel, Lake George, N. Y., on Saturday, June 11.

Financial and Corporate

Call for Columbus Briefs

Special Master Hearing Charges of Mismanagement Expected to Report Soon

After months of intermittent hearings attorneys for the Columbus Railway, Power & Light Company, Columbus, Ohio, and for E. W. Clark & Company, Philadelphia, respectively, have closed their arguments and the master commissioner who has been hearing the testimony has asked for the filing of briefs by both sides in the controversy between the two interests.

The litigation arose through the filing of the Slaymaker receivership suit many months ago, brought by a stockholder to compel an accounting and if possible precipitate a receivership. Into this situation attorneys for the Columbus Railway, Power & Light Company injected evidence tending to place the blame for the alleged mismanagement of the company on the Clark interests, engineering and financial agents for the railway for years.

Charges were made at the hearings that the Clark company realized a large profit for handling the bonds and notes of the Columbus company, while at the same time it was receiving fees for acting as its agent. An analysis of the Clark company's records was introduced by the rail-light attorneys covering various transactions. In one instance alone, that of Feb. 1, 1916, it was sought to show E. W. Clark & Company received from the rail-light company $3,500,000 in bonds, at 90 per cent of par, or $3,150,000, and that the Clark company within ten days made a profit of $82,557 on the bonds.

This record, attorneys for the company contend, bears out the charge made by Charles L. Kurtz, president of the company, that at the time the bonds were disposed of a much better price than 90 could have been secured by the company. One million dollars of bonds issued on May 3, 1917, are alleged to have gone through a somewhat similar procedure, despite objections raised by Mr. Kurtz, then merely a stockholder.

Further testimony was adduced to the effect that cash vouchers for money drawn by E. K. Stewart, general manager and treasurer of the Columbus company during the Clark alliance, were unsupported by any accompanying papers.

Documentary evidence was also introduced by Attorney Edward C. Turner, counsel for the rail-light company, purporting to show that the Clark company drew labor and construction fees totaling $165,075, in connection with the building of power stations. Mr. Turner contended that the Clark company was not entitled to these fees in addition to what it was already receiving. He also held improper a discount of $86,000 taken by the Clark company on securities handled by it.

It was testified in connection with the reorganization of the railway in 1919, after the court had threatened to appoint a receiver unless a new management should be provided, that Mr. Stewart refused to vote either for the ousting of the Clark interests or for any new official or director. Two other directors who voted against a change switched their votes later but Mr. Stewart held out, it was testified.

Master Commissioner George B. Okey, in charge of the case, may not report his findings for some time.

$152,119,927 of Securities Authorized

During the twelve months ended Dec. 31, 1920, California utilities filed with the Railroad Commission applications to issue securities that aggregated $179,668,083. The commission approved applications to the extent of $152,119,927, denied applications totaling $250,500, dismissed requests aggregating $3,491,560 and on Dec. 31 had pending applications totaling $50,678,783. In only two years since the effective date of the Public Utilities act, March 23, 1912, has the amount of securities authorized by the commission in 1920 been exceeded. In 1914 the commission authorized $226,725,501 and in 1916 $186,633,146. In 1919 the issues amounted to $72,774,902. Since March 23, 1912, the grand total of securities authorized by the commission amounts to $1,084,560,452.

Permission to issue securities was obtained by the several classes of utilities as follows:

	Twelve Months Ended Dec. 31, 1920	Twelve Months Ended Dec. 31, 1919
Steam railroads	$4,523,354	$4,812,811
Electric railways	46,434,279	8,867,562
Gas and electric companies	82,515,708	56,095,461
Water companies	12,215,650	1,445,831
Telephone and telegraph companies	2,990,755	161,390
Warehouse companies	401,050	634,200
Paper companies	....	....
Pipe line companies	....	....
Steamship companies	14,100	540,340
Motor companies	3,025,031	217,305
Total	$152,119,927	$72,774,902

The securities authorized to be issued were for the following purposes:

Purpose	Twelve Months Ended Dec. 31, 1920	Twelve Months Ended Dec. 31, 1919
To install additions and betterments	$73,045,192	$43,708,588
To refund indebtedness	3,508,460	18,526 152
To be used for collateral	29,580 000	797,000
For reorganisation purposes	43,594,500	9 743.162
For miscellaneous purposes	2,391 775	....
Total	$152,119,927	$72,774,902

Bondholders' Status Fixed

Holders of Underlying Securities Benefit by Ruling of Court of Appeals of Ohio

Holders of the underlying bonds of the former Cincinnati, Dayton & Toledo Traction Company's system between Cincinnati and Dayton, Ohio, benefit by a decision handed down by the Court of Appeals at Cincinnati, Ohio, in a case which came up from the Butler County Courts. The decision written by Judge Wade Cushing and concurred in by Judges F. M. Hamilton and Robert Z. Buchwalter gives these mortgagees rights in a $500,000 power plant near Hamilton built by the Cincinnati Traction Company.

The Cincinnati, Dayton & Toledo Traction Company was formed by consolidating six separate companies which operated portions of what later became the single traction line. The Butler County Common Pleas Court ruled against the holders of the bonds of these companies upon their claims against the power house, and they appealed to the Court of Appeals. That body now holds that the underlying bondholders or mortgagees are entitled to have their rights restored to the condition they were in when the system was operated as the Cincinnati, Dayton & Toledo Traction Company, or to have such an interest in the new power house as would equal the cost of such restoration.

This ruling was made upon the ground that when the new power house was built the five separate power houses were destroyed. The decision also holds that the underlying bondholders have similar rights in the new rolling stock, which was bought to replace old rolling stock sold or scrapped by the new company. Regarding the dispute over $250,000 which accumulated in the net earnings fund the court declares the operating company and the State Public Utilities Commission were neglectful as the net earnings should be apportioned among the several divisions on the basis of their earning capacity, and the court suggests a master commissioner be appointed to decide the proportion of distribution.

Two Years' Operation Compared

Service-at-Cost in Boston Proves to Be Earning More Nearly the Fixed Return

During the twelve months that ended Dec. 31, 1920, total expenses of the Boston (Mass.) Elevated Railway including dividends as guaranteed under the public control act, exceeded total receipts by $346,952. This result, however, is a great improvement over the preceding year, which showed a loss of $2,366,494.

The text of the report is the same as that included in the trustees' report to the General Court for the year ended Nov. 30, 1920, which was reviewed in the ELECTRIC RAILWAY JOURNAL of Jan. 22, page 197, and Feb. 26, page 420. All figures, however, are brought down to Dec. 31, 1920.

The average cost of service during the entire year was 10.246 cents per revenue passenger against average receipts of 10.143 cents. The average cost of coal was $10.07 per ton.

The views of the public trustees on the subject of fares are clearly expressed in favor of continuing the 10-cent flat rate for the time being. The 5-cent fare service on certain short lines not in competition with 10-cent lines is considered experimental until results can be determined.

Proper provision for depreciation is another highly important factor cited by the trustees as a reason and necessity for maintaining fares at higher levels than in the past. In concluding their report, they say:

> The occasion for the advance in fares on street railways is not alone the greater cost of labor, materials and supplies, but as well a radical change in policy with reference to provision for depreciation. It is now generally admitted that no sane management would fail to set aside from current receipts a sufficient amount to meet renewal and replacement of property that is wearing out day by day. The practice of maintaining these properties by hand to mouth methods has proved disastrous and is being abandoned.

INCOME STATEMENT

Operating Income:	Year Ended Dec. 31, 1920	Year Ended Dec. 31, 1919	Percentage Change
Passenger revenue	$33,096,764	$28,752,675	15.2
Special car revenue	12,183	14,869	*18.1*
Mail revenue	737	722	2.1
Express revenue	88,658	89,003	*0.4*
Miscellaneous transportation revenue	4,383	3,002	46.2
Total revenue from transportation	$33,202,725	$28,860,271	14.8
Station and car privileges	300,228	293,872	2.2
Rent of tracks and facilities	39,059	41,477	*5.8*
Rent of equipment	1,644	5,210	*68.5*
Rent of buildings and other property	100,500	82,514	21.2
Power	92,192	46,349	99.0
Miscellaneous	14,515	74,898	*80.5*
Total revenue from other railway operations	$548,138	$544,320	0.7
Total railway operating revenues	33,750,863	29,404,591	14.7
Railway Operating Expenses:			
Way and structures	3,226,275	3,783,715	*14.7*
Equipment	4,033,850	4,290,049	*6.0*
Power	4,568,992	2,980,659	53.2
Conducting transportation	11,524,823	10,530,882	4.4
Traffic	3,358	4,758	*29.4*
General and miscellaneous	2,411,824	2,110,285	14.2
Total railway operating expenses	$25,769,122	$23,700,339	8.8
Net revenue, railway operations	7,981,741	5,704,252	40.0
Taxes assignable to railway operations	1,142,988	1,045,502	4.2
Operating income	6,838,753	4,658,753	16.8
Non-Operating Income:			
Income from lease of road	823	823	....
Dividend income	9,180	9,180	....
Income from funded securities	6,357	6,290	1.0
Income from unfunded securities and accounts	233,380	42,853	444.0
Income from sinking fund and other reserves	28,853	33,280	*13.3*
Miscellaneous income	2,181	1,565	38.5
Total non-operating income	$280,774	$93,991	199.0
Gross income	7,119,527	4,752,741	49.6
Deductions from Gross Income:			
Rent for leased roads:			
West End Street Railway Co	$2,590,258	$2,540,893	2.0
West End Street Railway Co., Tremont Subway	177,686	176,545	0.6
Other roads	48,304	57,794	*16.4*
Total rent for leased roads	2,816,248	2,775,232	1.5
Miscellaneous rents	1,612,746	1,339,502	20.8
Net loss on miscellaneous physical property	9,326	7,986	16.8
Interest on funded debt	1,307,019	1,309,477	*0.2*
Interest on unfunded debt	207,945	246,313	*15.5*
Amortization of discount on funded debt	34,860	44,291	*21.3*
Miscellaneous debits	14,882	8,070	84.2
Total deductions from gross income	$6,003,026	$5,730,871	4.8
Net income transferred to credit of profit and loss	1,116,501	978,130	14.0
Proportion of dividends	1,463,668	1,403,970	4.3
Net loss or gain (including proportion of dividends)	*$347,167*	*$2,382,100*	85.2
Profit or loss—delayed items	215	15,605	....
Total deficit	*$346,952*	*$2,366,495*	

TRAFFIC STATISTICS

Year Ending December 31: Revenue Miles:	1920	1919	Percentage Change
Rapid transit passenger cars	14,540,474	14,139,619	2.9
Surface passenger cars	36,697,053	39,393,903	*6.8*
Express cars, etc	106,635	175,020	*39.4*
Sprinkler cars	15,693	12,707	23.2
Total	51,359,855	53,721,249	*4.4*
Revenue Car Hours:			
Rapid transit passenger cars	984,150	978,591	0.8
Surface passenger cars	3,643,145	3,770,727	*3.3*
Express cars, etc	10,218	16,765	39.1
Sprinkler cars	1,516	1,017	49.1
Total	4,639,029	4,767,100	2.7
Passengers Carried:			
Revenue passengers on rapid transit and surface cars	335,526,561	324,758,685	3.0
Miles of line	248.16	248.42	....
Miles of revenue track	461.87	462.56	....

Italic indicates deficit or decrease.

Financial Rearrangement Proposed

Another change is proposed in the financial structure of the Northern Ohio Traction & Light Company, Akron, Ohio. On May 16 the stockholders of that company will vote on reclassifying the present 6 per cent preferred stock, of which $10,000,000 is authorzed, so that $5,451,800 will be 6 per cent preferred stock and $4,548,200 will be 7 per cent preferred stock. The amount of common stock is to remain at $10,000,000. All preferred stock dividends are to be cumulative and save as to the rate of dividends, both classes of preferred stock are to have identical preferences and voting powers.

It is explained that during the past four years the company has more than doubled its gross earnings. Also during this period more than $7,900,000 has been expended in enlargements and improvements. More money is now required for like purposes. The course open to the company is to sell bonds, debentures or stock. As the present 6 per cent preferred stock cannot be sold at a reasonable price the management has decided that it would be advantageous to increase the dividend rate to 7 per cent and put out more stock than to issue debentures or other short-time obligations which would take precedence over the preferred stock and have a fixed maturity. The stock at the price offered will give the purchaser a return of 7.37 per cent. Stockholders are to be offered the opportunity:

1. To subscribe for 7 per cent preferred stock at 95 and dividends. For each share of 7 per cent preferred stock so subscribed, two shares of 6 per cent preferred stock may be exchanged for two shares of 7 per cent preferred stock.

2. To exchange 6 per cent preferred stock for 7 per cent preferred stock without subscribing for 7 per cent preferred stock upon the payment of $10 per share on condition, however, that the holders agree not to sell prior to Jan. 1, 1923, for less than $95 per share the 7 per cent stock so acquired. This requirement is to protect the company's market during the campaign which it proposes to conduct for the purpose of selling preferred stock to customers.

The company will accept payment in installments over a period of eight months.

A Road Without an Owner

The Monterey & Pacific Grove Railway, operating between Monterey and Pacific Grove, Cal., will have to raise $8,000 and be prepared to spend that amount in putting the system in shape, before any relief will be given in the shape of increased fares. This is the order of the Railroad Commission of California issued on April 11, on the application of the utility for authority to increase its charges.

The line was once controlled through stock ownership by the Coast Valleys Gas & Electric Company. The ownership, according to the Coast Valleys company, changed in May 1920, when the stock of the railway was sold at public auction in New York City to L. T. Fetzer. It brought $184. The Coast Valleys Company, however, still owns the carhouse and shops. James S. Pollard, president of the Coast Valleys, says there is no corporate connection between his company and the owner of the railway line.

Neither the New York owners nor the Coast Valleys are willing to assume liability for the railway company's bonded indebtedness or other debts. At the public hearing on the matter held by the commission the local manager of the road was asked if he or some other authority would make available a few hundred dollars necessary to make urgent track repairs.

"There is no such authority," he answered.

The commission is satisfied that the local management is capable, but it says the needed cash must be placed at his disposal before higher fares will be considered. Investigation by the commission shows that there is outstanding common stock of the par value of $300,000 and $270,000 of bonds. The total investment in road and equipment, as shown by the company's last annual report, December, 1920, is $612,833. Against these figures the commission's engineers find a reproduction cost of $132,488 and a depreciated reproduction cost of $73,214.

Bond May Remove Need for Receivers Acting

Action taken by Homer Hennegar, judge of the Tippecanoe County Circuit Court at Lafayette, Ind., in the appointment of receivers for the Lafayette Service Company, was suspended recently when the defendant company filed an appeal bond in the sum of $75,000. In consequence the local railway is again placed in the control of the Lafayette Service Company and Edward M. Watson and Frank Scott, receivers, are relieved of their duty until the Supreme Court of Indiana rules on the appeal.

Mr. Watson and Mr. Scott recently took over the management of the railway as receivers following proceedings instituted by a local property owner, who alleged that by reason of the company's failure to relay tracks and resume service on East Main Street his property there had been damaged.

A special attorney for the city asked that the appointment of a receiver be delayed in the interest of the Eastern bondholders. The court refused to defer action and said that the receivers would be empowered by the court to proceed with the relaying of the East Main Street track and make other needed repairs. The railway attorneys gave notice of appeal.

It is said that the attorney of the bondholders made a statement at the hearing on the petition for a receiver that the line would be improved generally and the Oakland Hill line rebuilt, and that six new one-man cars would be put in operation in Lafayette by Sept. 1. The filing of the bond will now afford the company an opportunity of carrying out these suggestions of the attorney.

Cheerful News—Seattle Has a Surplus

If Seattle can keep up the pace of earnings established by the Municipal Railway in March then two years hence the present cash deficit in the operation of the road may be wiped out. This is the assumption based on the surplus of $18,538 shown for that month. Mayor Caldwell has never waxed very enthusiastic about the Municipal Railway, but he is cheered by the change from red to black in the statement of earnings. He said:

> The financial report of the Seattle Municipal Street Railway for March, delivered to me by the general superintendent of railways, shows the total revenues $545,382.
>
> This was swelled by some forteen odd thousand dollars received in March for property previously sold, thus swelling the receipts to $564,098.
>
> The total expenses for March were $383,129. To this expense should be added interest on general bonds, $2,979; interest on utility bonds, $68,533; discount on utility bonds, $575; miscellaneous interest (warrants), $1,375; or a total expense for March, exclusive of depreciation, $456,593; to which should be added one-twelfth of the installment of principal due next March, $70,250, or a total expense, including installment of interest and principal of $526,843, with revenues of $545,382, or a surplus of $18,538 to apply on the actual cash deficit or on depreciation charge.
>
> If this basis continues for two years we will be able to wipe out the actual cash deficit. The receipts of the fourteen odd thousand dollars above referred to will also go toward wiping out the actual cash deficit.
>
> The only other full month on the present 8⅓-cent fare is February, with its twenty-eight days. By taking 28-31 of the March revenues of $545,382, we get $492,603, for twenty-eight days as against $492,758, revenues for February, or practically the same.
>
> The total number of passengers of all kinds carried during the thirty-one days in March was 8,398,294 as against 7,523,915 for the twenty-eight days of February and as against 8,466,553 for January, eight days of which were under the 6¼-cent fare. The figures show that Easter Sunday, March 27, there were 237,947 passengers, or 42,000 more than on *any* other Sunday in the month. Evidently a lot of people go to church once a year.

Service Resumed by Commission Order

Public Service Commissioner Barrett authorized the Brooklyn Rapid Transit Company on April 24 to resume service on the Church Avenue line without transfers. The order followed the enactment of the bill of Assemblyman Walter F. Clayton, under the terms of which the Public Service Commission was granted authority to permit service for a 5-cent fare minus transfers. The original charter of the old Nassau Electric Railroad provided for transfers, but Receiver Garrison said the line could not be operated at a profit if the transfer privileges were insisted upon. The line has not been running since the strike in August of last year. It carried 1,000,000 passengers a month, about 600,000 of whom the company claimed took transfers. The shutting down of the line has been a great inconvenience to the traveling public, the line being the only crosstown line in that section of Brooklyn.

Financial News Notes

Mr. Adair Resigns as Atlanta Director.—Forest Adair has resigned as a director of the Georgia Railway & Power Company, Atlanta, Ga. He has been a director of the company since 1912.

Abandonment Approved.—The Millville (N. J.) Traction Company has been granted permission by the City Commission of Millville to abandon its line in South Millville and the tracks will now be removed.

Rhode Island Company Losing.—In its report for February, 1921, recently submitted the Rhode Island Company, Providence, R. I., failed by $109,141 to meet its fixed charges. This makes a deficit for the first two months of the year of $183,219. The passenger earnings, however, increased $61,827 or 12.5 per cent over the same month a year ago.

Receiver for Austin Street Railway.—William J. Jones, president of the Austin (Tex.) Street Railway, has been appointed receiver of the company on the application of the Rochester Trust Company, Rochester, N. Y. *Moody's* gives the only bonded indebtedness of the company as $780,000 of 6 per cent bonds dated 1911 and due 1936, with the Equitable Trust Company, New York, N. Y., as trustee.

$800,000 Written Off.—In connection with the payment of the dividend for the first quarter of 1921, at the rate of 7 per cent, the Capital Traction Company, Washington, D. C., announced that increased earnings during the last two years have made it possible for the corporation to write off losses of previous years due to the enforced retirement of single-truck cars. Some $800,000 was written off.

Car Trusts Offered. — Alexander Brown & Sons, Baltimore, Md., recently offered for subscription at prices to yield about 8 per cent, according to maturity, $240,000 of 7 per cent car trust bonds of the Annapolis Short Line

Railroad. The bonds are dated Jan. 1, 1921, and are due $24,000 annually from Jan. 1, 1922, to 1931. They are unconditionally guaranteed as to principal and interest by the Washington, Baltimore & Annapolis Electric Railroad.

Sale Decree Filed.—An agreed decree approving the sale of the Gary (Ind.) Connection Railway and the Gary & Valparaiso & Northern Railroad to representatives of the first mortgage bondholders of the two companies was filed with the clerk of the Federal court recently. The object of this suit, it is said, is to enable the first mortgage bondholders to continue the operation of the roads and to clear the bonds and lift the receivership. Actions to declare the roads insolvent were filed in 1918.

Commission Modifies Bond Issue.—An order has been made by the Public Service Commission of Indiana modifying a former order permitting the Indianapolis & Louisville Traction Railway, Scottsburg, Ind., to issue $178,000 of 5 per cent first mortgage bonds, dated April 1, 1912, and maturing in thirty years. The previous order permitted the sale at 80 per cent of par, but the bonds may now be sold at not less than 75 per cent. The proceeds are to be used solely in paying 80 per cent of the cost of improvements and additions made between June 16, 1919, and Sept. 20, 1920. The company has been absorbed by the Interstate Public Service Company, Indianapolis, Ind.

Limit to Indebtedness Removed.—The limit of indebtedness of the Minneapolis Street Railway, which has been $1,200,000, has been removed by an amendment to its articles, filed with the Secretary of State. The directors voted a resolution which reads: "Whereas it is deemed advisable by said Minneapolis Street Railway that said limitation of indebtedness or liability be removed, now, therefore, be it resolved that Article 4, limiting indebtedness and liability to $1,200,000, be and the same hereby is amended to read as follows, to wit: "The amount of indebtedness or liability to which said corporation shall at any time be subject shall not be limited."

B. R. T. Wants Transfer Points Discontinued. — Although Public Service Commissioner Barrett has approved the application of three companies at present under the receivership of Lindley M. Garrison to resume experimental operation on a part of the Park Slope line the Brooklyn Rapid Transit Company, Brooklyn, N. Y., has refused to put its own plan into effect. A new condition for restoring service in that section is that the Public Service Commission should permit the discontinuance of the 2-cent transfer at thirty-six other points in the borough. Service on the Park Slope line has been suspended since Jan. 13. The operating companies promised resumption if the route were made shorter. When the commission did not approve of shortening the route service was abandoned.

Hartford Lines Doing Well.—President Lucius S. Storrs of the Connecticut Company said at a recent hearing before a committee of the Legislature at Hartford that the 10-cent fare—raised from 7 cents on Nov. 1, 1920—has been very successful from a financial standpoint. The Connecticut Company's local charter requires the payment to the City of Hartford of 2 per cent of gross receipts. This amounted to $34,283 on an income of $1,714,176 in 1919 and $42,883 in 1920, when the gross receipts were $2,144,194. Thus there has been an increase in income on Hartford lines of $430,017 in the past year. In Hartford jitneys were eliminated by means of a city ordinance, so that the company is free from competition that has grown to serious proportions in other cities in which the Connecticut Company operates.

$15,000 Voted for San Francisco Appraisal.—At a meeting of the public utilities committee of the Board of Supervisors of San Francisco, Cal., on April 13, it was voted to recommend that the finance committee provide $15,000 for the city engineer's appraisement of the properties of the United Railroads and to fix a valuation at which San Francisco can acquire the system by paying for the property out of the earnings of the railway without a bond issue. According to Amendment 30, carried by a 30,000 majority on the November, 1920, ballot, an enabling act was approved providing for the purchase of public utilities on a "pay-as-you-go" basis. It is expected that a proposal for the purchase will be placed on the ballot at the general election in November.

$221,786 Surplus at Richmond.—Incident to changing its year from June 30 to the calendar year stockholders of the Virginia Railway & Power Company, Richmond, Va., met on April 21. Only routine matters were discussed and the present directors and officers were re-elected. The statement of earnings and expenses of the company compiled for the system for the six months ended Dec. 31, 1920, showed the total gross earnings to be $5,779,545, an increase of $987,494 over the same period of 1919. Operating expenses totaled $4,280,682, an increase of $1,074,314 over the same period of 1919. Taxes and licenses paid by the company for the six months amounted to $354,701, an increase of $28,339. The surplus over fixed and all other charges, including depreciation, for the entire operations for the period was $221,786.

Dallas Steadily Going Behind.—A detailed statement of operating costs and revenues for the thirty-nine months of its operation under the present franchise was presented by the Dallas (Tex.) Railway before the Board of City Commissioners in the fare hearings now being conducted on the company's application for a 7-cent fare. The operating statement shows that the company incurred a deficit of $651,374 between Oct. 1, 1917, and Dec. 31, 1920, and that the return realized for the first three months of 1917 was 4.55 per cent; in 1918, 3.75; in 1919, 5.09, and 1920, 4.87. The return for the operation of the terminal for these periods was somewhat less. The pay of platform men has increased 113 per cent since 1915, according to figures in the statement. The property value of the company has increased from $7,662,069, to $9,317,813 in the last three years. The original valuation was agreed upon when the franchise was granted and each addition has been made in accordance with the terms of the franchise and on authority of the Supervisor of Public Utilities.

Even Electric Railway at Miami Prospered.—The wealth of the world goes to Miami, Fla. Moreover, the wealthy don't all ride around in the lap of luxury in their own Packards or Rolls Royces. Not at all. Proof of this is available. Look at the Miami Beach Electric Company's record. Bringing the total number of passengers for the season up to more than a quarter millon—263,165 to be exact—the Miami-Beach Electric Company, Miami to Miami Beach, Fla., hauled 80,166 passengers during the month of March, according to figures announced by Manager Ellis. Then, too, the company paid the county of Dade, which built the causeway the electric company uses, $1,101.16 during the month. This represents 1½ cents for each passenger that crossed the causeway by trolley. Mr. Ellis now proposes to take up with the county commissioners the question of building four switches, 300 ft. long, two of which have to be built on the causeway, so as to permit a ten-minute schedule between Miami and Miami Beach.

Protective Committee Recommends Refunding.—Owing to the continuation of the receivership of the Birmingham Railway, Light & Power Company, Birmingham, Ala., the company found it impossible to pay off the $1,200,000 of 6 per cent two-year gold notes which fell due on April 1. The notes originally came due on April 1, 1919, but were extended to April 1, 1921, at 7 per cent. The protective committee representing the noteholders has entered into a tentative agreement with representatives of the owners of the equity of the property, under which it is proposed to issue to the depositing noteholders general and refunding mortgage twenty-year 8 per cent bonds, Series A, par for par. In addition the company proposes to use the proceeds of $800,000 of general and refunding mortgage twenty-year, Series B, 8 per cent bonds, together with cash from the sale of securities junior to these bonds, to reduce the floating debt to an amount not to exceed $450,000. Failure on the part of the committee to deliver 85 per cent of the outstanding notes for exchange will defeat the plan. At the time the proposal for the exchange was made to the security holders there were on deposit with the committee $1,197,000, par value, out of the $1,200,000 total of notes outstanding.

Traffic and Transportation

Eight-Cent Fare Still

Court Restrains City of New Orleans from Reducing Fare of Railway in Receivership

Judge Henry D. Clayton, Montgomery, Ala., presiding in the Federal District Court at New Orleans, La., in lieu of Judge Rufus E. Foster, who excused himself at the suggestion of the officials of the city government, has sustained the contention of the New Orleans Railway & Light Company and granted the company a temporary injunction restraining the city from interfering with the operation of cars there or changing the rate of fare, fixed by the court at 8 cents.

An ordinance adopted by the city placed the rate of fare at 7½ cents. This rate of 7½ cents Judge Foster refused to approve. Moreover, Receiver O'Keefe, of the railway, refused to put the new rate in force under the ruling of the court. The city has two weeks to answer the temporary injunction and City Attorney Ivy G. Kittredge and his assistants are now engaged in preparing the city's defense against a permanent injunction.

The people have taken the decision uncomplainingly, but not so the city officials. It is the belief of Commissioner Maloney, of the Public Utilities Commission, that the ruling of the court paves the way for an ultimate fare of 10 cents. He bases his opinion upon the ruling of the court which restrains the city from interfering with the 8-cent fare or any other rate of fare which the federal court and the receiver of the company may determine as necessary to give a fair return upon the valuation of the property.

From figures taken from the petition of the railway and reports of the business transacted by the company during the first two months of 1921 Commissioner Maloney draws the conclusion that there will be a difference of $1,425,549 between the 3.1 per cent earned at present and the 8 per cent return petitioned for. With reference to this matter Mr. Maloney says:

> From the petition of the receiver it is noted that the alleged value of the railway property is given at $29,400,000 and that the rate of return he asks is 8 per cent.
>
> During the first two months of this year the system earned a net return of 3.1 per cent. He asks the court for such other fare as the court may find necessary to enable the payment of all operating expenses, the usual reserve and a "fair return" on the valuation of the property.
>
> The city is enjoined from interfering with the 8-cent fare or the other fare that the court may fix.
>
> On the basis of 110,000,000 passengers carried yearly an increase of 1.3 cents per passenger would be required. Interest on the new money would call for an additional increase bringing the total fare up to about 10 cents.

There is talk on the part of representatives of the city of permitting the jitneys to return.

It is reliably reported that a representative of the Eastern investment bankers, now on his way to New York, called on Commissioner Maloney to learn his final stand on the matter and that nothing will be done until word is received from this representative.

Bus Regulation May Go to a Vote

The old traction fight at Toledo, Ohio, will again be brought before the people at an election this fall through the filing of a referendum on the bus regulatory ordinance passed by Council a month ago. It had been proposed to put the ordinance into effect on April 21. It provided for tax of from $25 to $100 for each vehicle and required the bus owner to furnish bond from $5,000 to $10,000 depending upon carrying capacity.

The measure was counted upon to put the bus business on a fair competitive basis with the cars of the Community Traction Company, and it was thought it would divert between $500 and $1,000 a day to the railway system. Street Railway Commissioner Wilfred E. Cann and city officials favored the regulation of the buses. They will probably make an active fight before the people for passage of the ordinance.

Progress is reported on the fixing of a fair rate for power to be charged by the Toledo Railways & Light Company for the operation of the traction lines. David Friday, Ann Arbor, economist, and V. B. Phillips, Cleveland, consulting engineer, have been retained by the city to fix the charge for this service.

Five-Cent Fare Lines Planned in Medford

The trustees of the Boston (Mass.) Elevated Railway have authorized the extension of the 5-cent fare for local riders to six lines operating in Medford and part of Somerville to the Sullivan Square terminal of the main rapid transit line. As in the case of the 5-cent fare service in Malden and Everett, started recently, a fare of 5 cents will be charged for a local trip without transfer by means of payment to the conductor on the car, while a 10-cent fare will be charged if the passenger continues his ride on the rapid transit line to Boston. A local cross-town service will also be started in this community, operated with one-man cars, on a 5-cent fare basis.

No date has been set for commencing this service, but it will be undertaken as soon as the necessary arrangements can be made for the collection of 10-cent fares from inbound passengers arriving at the Sullivan Square Terminal on these lines.

Railway Protest Unavailing

Autos to Compete with Bamberger Electric—Commission Must Not Bar Progress

An automobile stage line is to be operated between Salt Lake and Ogden, Utah, a certificate of convenience and necessity having been issued by the Public Utilities Commission of Utah, after a hearing on the application for the permit of Bruce Wedgwood and Fred A. Boyd.

The application of Wedgwood and Boyd was contested by the Bamberger Electric Railroad and the Oregon Short Line Railroad, on the ground that they are prepared and ready to give adequate freight service, by means of equipment and rights-of-way obtained at a huge expense, and that there is no public necessity or convenience to be served by the new method of transportation that they cannot serve or are not willing to serve. They further set up that the proceeds of the taxes they pay go in part to the construction and maintenance of the highways. The applicants, it was pointed out, would operate over these highways, without contributing anything to their construction or maintenance.

CLAIMS OF THE TRUCK OPERATORS

On the other hand the operators of the truck service contended that they are able to give a superior service, one that would be speedier in its operation, and would also require the handling of the goods fewer times. The commission yielded to this argument, but in deciding that service may be established also sets up some conditions.

In its decision the commission said in part:

> The applicants must furnish stations, warehouses and persons to take charge of and keep, with reasonable safety, the freight intrusted to their care. There must likewise be an assurance that the parties giving service will be able to furnish sufficient rolling stock to take care of the business. Such direct handling and hauling of freight would clearly indicate that a service would be rendered that would be more convenient and direct than is given by the railroads.
>
> The commission should not attempt to bar progress. The power vested in the commission is intended to be constructive, not repressive. The public is entitled to the best service possible to be given, and to the freest utilization of valuable new inventions. If the motor truck can demonstrate its superiority over the railroad for the transportation of short-haul .freight, and if by its use economy of time or money is effected, public convenience and necessity will require its being brought into service, and ultimately it will be used, with or without sanction.
>
> Even now trucks are carrying great quantities of freight over the route in question here. This is being done under private contract, which places the service outside the range of regulatory law. If this petition is granted it is probable that much of this traffic will come under control, and rates and service will be stabilized and made more satisfactory and dependable every way to the shipping public than it now is under private contract operation.

The order requires the publishing of schedules of rates and fares and of arriving and leaving time at the various stations to be served by the new service. It is effective on due notice to the commission and the public, which means thirty days after filing with the commission.

San Antonio Decision Prompts Filing of Supplementary Brief

Recent decisions of the United States Supreme Court in public utilities rate cases, especially the case in favor of the electric railway at San Antonio, have prompted Churchill Humphrey, attorney for the Louisville (Ky.) Railway, to file a supplemental brief in the United States District Court of Appeals at Cincinnati, claiming that the litigation now pending between the Louisville Railway and the city of Louisville in the Federal Courts is analogous to the conditions governing the San Antonio case.

Mr. Humphrey holds that the two cases are alike in that the city of Louisville is without legislative authority to enter into an irrevocable contract with the company, since by so doing it would lose its right to regulate the operation of the railway system.

A Dead Cow Is Worth More Than a Live One

A combination of paris green to turn the grass brown and the free-range law in Florida have just cost the Tampa Electric Company $11,000—for the usual array of registered cattle that always bobs up where only the tick-infested breed sprung before the railroad knocked 'em over, or in this case the railway poisoned them.

In an endeavor to eradicate weeds and grass growing between its tracks on the suburban line to Port Tampa the Tampa Electric Company sprinkled the way with a solution of paris green. During the night the "sacred" cows of folks along the line and in Port Tampa indulged freely of the grass and weeds and a total of 102 died within the succeeding ten days. Of course they all died from the poisoned grass. When it came time to settle the cows came high. The owners even refused to allow for the hide and collected in a total, more than $11,000 according to T. J. Hanlon, Jr., general manager.

The Tampa *Tribune*, waging a fight for a No-Fence law abolishing free range, seized upon the incident to show passengers one of the reasons why railroad rates and trolley rates seem high—because the public must foot the bill for such follies as free range.

Railway May Take Over Jitneys

The possibility was discussed of bringing the entire transportation facilities of Muskegon, Mich., and surrounding community under the ownership of the Muskegon Traction and Lighting Company and under control of proper, publicly constituted authority at a hearing recently conducted by the Michigan Public Utilities Commission.

A joint committee representing the various interests of the community was named to compile a definite report as to the possibility of the traction company buying the bus equipment now in use, and to gather all other necessary data relative to a revolutionary move of this kind.

If the traction company finds it possible to finance such an undertaking it appears likely the committee will recommend that this solution of the present and long-standing problem be adopted.

President George Steinwedell said he would take the matter up with the company at once and would know in a short time if it would be possible for the company to purchase the jitneys, which have a present value of about $50,000.

East St. Louis-St. Louis Rates Upheld

The Interstate Commerce Commission has dismissed the complaint of the Greater Belleville Board of Trade against the fares on the East St. Louis & Suburban Railroad for the transportation of passengers from Belleville and East St. Louis, Ill., to St. Louis, Mo., finding them not unreasonable, unduly prejudicial, or otherwise unlawful. It was charged that the railway had not only increased materially the interstate fares previously in effect, but had changed the basis of such fares by establishing various fare groups or zones.

The complaints further stated that the fares assailed materially exceeded the one-way and commutation fares previously in effect, and that the time within which commutation fares could be used had been reduced from sixty days to a calendar month. They contended also that the present fares were unreasonably high, distances considered, in comparison with fares in effect over defendants' city line, and that the disruption of long-existing fare groups retarded the development of these communities, and imposed an undue burden upon their inhabitants.

Witnesses for the railroad testified that electric interurban lines generally throughout that section were charging 3 cents per mile, having obtained injunctions from the federal courts wherever the provisions of state statutes were contravened. They showed that the fares on the Belleville division had been maintained on a lower basis than those applying over their other interurban lines. The former, as increased on the dates previously mentioned, average slightly more than 2 cents a mile from Belleville to St. Louis, and a fraction under 2 cents to East St. Louis, whereas the latter were increased at the same time to 3 cents per mile. The travel over the other divisions is not as heavy as over the Belleville division, but the witnesses for the company said that due consideration has been given to this factor.

"Tokens" for Convenience and Economy.—The Peoria (Ill.) Railway is using "Tokens" exclusively on its city lines at the rate of two for 15 cents or in multiples of 15 cents. The cash fare in Peoria is 8 cents.

Retention of Five-Cent Fare Recommended

City Attorney, Robert L. Shinn, of Sacramento, Cal., recently received a report from the California Railroad Commission offering recommendations for the operation of the Pacific Gas & Electric Company "with increased revenue without sacrificing service." Among the suggestions are the following:

A continuation of the present 5-cent fare.

The installation of thirty-six new one-man cars.

The construction of a loop at the Southern Pacific station.

The elimination of duplications of service at a saving of $29,000 for the year.

The continuation of bus service.

In the matter of continuing the present 5-cent fare, which was the point at issue when the Pacific Gas & Electric Company sought the survey, the elimination of coupon books is suggested, thus making all regular fares 5 cents. It is also recommended that a full half fare be charged school children and that all free transportation except to those in the transportation department be denied. Commissioner D. N. Carmichael has stated that he is willing to carry out the recommendations of the State Railroad Commission if the company will assist the city.

Civic Bodies After Des Moines Jitneys

The two leading business men's organizations and the women's club took a hand during the week ended April 16, in an effort to help bring order out of chaos in the Des Moines City Railway-City Council-jitney controversy. The Greater Des Moines Committee and the Chamber of Commerce each chose committees to make it their special business to help solve the problem, while the women's club adopted resolutions urging elimination of the buses.

A meeting of the two committees named by the commercial organizations with members of the City Council, representatives of the street railway employees unions and officials of the Des Moines City Railway was set for April 18 and it was the hope of the civic organizations that some tangible good would result.

In its preliminary work the committee of the Chamber of Commerce offered three possible suggestions:

1. Abrogation of the present working agreement between the company and its trainmen, and placing the men on an open shop basis.
2. Elimination of the buses from the streets on which street cars operate.
3. Reduction of the fare from 8 cents to 6 cents.

According to the terms of the Lake jitney bus bill, passed at the recent session of the Iowa Legislature, councils of Iowa cities may by vote restrict the operation of jitney buses to streets which are not occupied by electric railway tracks. This law will give the City Council of Des Moines a chance to rid the city of the buses in case a settlement is made of the street railway question.

Prefer 10-Cent Fare to Zone System

The Massachusetts Department of Public Utilities has announced a public hearing to be held on May 4 in Boston, on the petition of eleven cities and towns served by the Worcester Consolidated Street Railway for a revision of the suburban zone fare system now in effect. The petitioners protest the 7-cent zones and request a return to the old fare limits, generally speaking the boundaries of cities and towns, a 10-cent flat fare being suggested. The city of Worcester is not included in this matter, a 10-cent fare having been established there on Feb. 6 by order of the Department of Public Utilities. It was at that time that the fare on the suburban line zones was increased from 6 to 7 cents per zone, this increase having lead the suburban patrons to petition for a flat 10-cent fare in preference to the short zone system and 7-cent rate.

Transportation News Notes

One-Man Cars for Entire System.—The Madison (Wis.) Railways has petitioned the Railroad Commission for permission to equip its entire system with one-man cars.

Ten-Cent Fare in Effect.—The New Jersey & Pennsylvania Traction Company, Trenton, N. J., is now charging a 10-cent fare on its Pennsylvania divisions running out of Trenton, the increase having been allowed by the Public Service Commission of Pennsylvania. The company had been charging 8 cents.

Eight Cents in Scranton.—Under an order recently handed down by the Pennsylvania Public Service Commission the Scranton Railway is authorized to collect an 8-cent cash fare upon thirty days' notice, with four tickets for 30 cents. The present rate is 7 cents, with four tickets for 25 cents. At the expiration of a year, during which time the new rate will be in effect, the commission will review the railway finances and give a new finding.

Ten Cents in Alton. — An increase from 8 cents to 10 cents in fare on the Alton lines of the Alton, Granite City & St. Louis Traction Company has gone into effect. The rate between Venice and Brooklyn has also been raised from 8 cents to 10 cents, with tickets at five for 40 cents. Federal Judge English has granted an injunction restraining Illinois authorities from interfering in the fare adjustment by the company, which is in the hands of federal receivers.

Galveston Railway Gets New Hearing.—Judge Hutcheson recently granted the motion asked by counsel for the Galveston (Tex.) Electric Company for a new hearing, after having recently decided the case in favor of the City of Galveston in denying an injunction against the enforcement of the 5-cent fare ordinance. The court indicated that more information on the cost of maintenance and depreciation will be forthcoming through the appointment of a special engineer by the court for investigation of the costs.

Ten-Cent Fare Denied.—The Board of Public Utility Commissioners of New Jersey has declined to consider an application of the Jersey Central Traction Company for permission to increase fares on all its lines from 7 to 10 cents, pending action by the State Supreme Court on an appeal from a ruling of the old board which rejected a similar application. The application was based on a statement that under the present tariffs the company has lost money steadily and will be forced into the hands of a receiver unless relieved.

Recommendation Reported Incorrect.—H. C. Eddy, street railway engineer of the Board of Public Utility Commissioners of New Jersey, denies that the recommendation was his that patrons of the Trenton & Mercer County Traction Company, Trenton, N. J., be required to have the exact fare ready when they board the cars or be made to pay 10 cents for a ride. Reference to this recommendation was contained in an item entitled "Commission Inspector Reports on Crowding," which appeared in the ELECTRIC RAILWAY JOURNAL for April 9.

Eight Cents in Cedar Falls.—Fares in Cedar Falls, Iowa, were increased from 7 cents to 8 cents on April 1. This change is in accordance with an agreement made between General Manager Cass of the Waterloo-Cedar Falls Northern Railway, Waterloo, Iowa, and the City Council that the company could advance the rate if after operating for a month under the 7-cent fare the revenue was found to be less than the average monthly revenue derived from the 10-cent rate which had been in existence for the five months previous. A statement issued from the offices of the company's auditor shows that there has been a decrease of 15.3 per cent as compared to the average daily receipts for the five months previous.

Fares Lowered in Rockford. — The Rockford and Interurban Company, Rockford, Ill., has lowered cash fares from 10 cents to 8 cents within the city limits of Rockford. The company has been charging 10 cents since March 1, 1921, and the new fare became effective April 1. The rate of cash fare is the same on both interurban and city cars within the corporate limits. The decision of the company to reduce the fare 2 cents was reached following complaints of Rock View residents, who objected to paying 10 cents, inasmuch as they live adjacent to the Elgin and Belvidere Electric Company and the Fifth Avenue cars of the City Traction Company of Rockford, both of which now charge 8 cents. All cash fares are now equal.

Reasons for Fare Increase Explained.—Increases granted to the Orem Electric Railroad, Salt Lake City, Utah, in passenger fares are not for the purpose of paying dividends, according to W. C. Orem, president of the company. To make this plain Mr. Orem has had prepared a number of bulletins for display in all of the waiting rooms of the company. The bulletins set forth the amount of increases allowed, which is from 3 cents to 3.6 cents a mile for one-way, with 180 per cent of the one-way fare for the round trip. The former fares for round trips were 190 per cent of the one-way fare. Commutation and school tickets have not been increased in price. Following this citation of fares is a statement that the increased revenues are for the purpose of meeting increased wages, high cost of materials, higher taxes, and interest on money borrowed.

Two Zones Instead of Three.—The Public Utilities Commission of Utah has rendered a decision establishing two zones on the Holliday line of the Utah Light & Traction Company instead of the three which have prevailed in the past. The order is issued as a result of a petition filed by patrons of the line alleging that the three-fare rate was discriminatory and had held back the settlement of the southeastern territory served by the railway. The complainants further alleged that the three-fare system worked an injustice on the traveling public and especially children attending school in Salt Lake. In answer the Utah Light & Traction Company alleged that the fares were just, in that the territory served is sparsely settled, and that the three-fare rate was necessary to produce adequate revenue. The new two-fare system became effective on April 6.

Fares Changed at Columbia.—The Columbia Railway, Gas & Electric Company, Columbia, S. C., discontinued the use of free transfers on Feb. 14, putting into effect on that date exchange tickets at a price of 3 cents each. In other words, the company installed the same kind of system that has been in use by the Philadelphia Rapid Transit Company for some time. The company has since applied to the Railroad Commission for permission to increase the fare from Columbia to Camp Jackson. Ever since the construction of the Camp Jackson line in 1917 it has charged 10 cents, or 5 cents for each zone, the line having two zones. The soldiers were given the benefit of the reduced rate by charging them 15 cents for the round trip when they purchased tickets at the camp exchange. If the company secures permission from the Railroad Commission to charge 7 cents in each zone, the special rate to soldiers will be discontinued and they will be required to pay the same rate of fare as civilians.

Personal Mention

Railwayman President

J. W. Shartel, Oklahoma Railways, Elected to Presidency of State Utilities Association

John W. Shartel has been re-elected to the presidency of the Oklahoma Utilities Association, the precedent of a single term for this office having been abandoned. Mr. Shartel is one of the pioneer electric railway builders of that state. He organized and built in 1902 the Oklahoma Electric Railway, Oklahoma City, Okla., of which he is now vice-president and general manager.

By virtue of the keen and farsighted policy of Mr. Shartel in providing abundant transportation facilities it has been possible for Oklahoma City to grow from a town of 15,000 to a city of 100,000 population in the brief period of about twenty years. The company has been liberal, almost to the extent of being radical, in building new lines through unsettled districts awaiting developments and has successfully carried a large percentage of unproductive mileage until the time when the volume of traffic became sufficient to make it self-supporting.

At the time the undertaking was started, the communities all being small, the street extensions were laid out with private rights-of-way in the center for car tracks, with the result that more than 110 miles of the 145 miles comprising the interurban and city systems are now on private rights-of-way. In advance of the growth of the city the rights-of-way procured for high-speed entrances for interurban cars into the centers of all cities are without grade crossings at either highway or railway. The company has acquired approximately 100,000 sq.ft. of valuable land leading into the heart of the city, where its present terminals are located and where it contracts all its interurban and city transfer business.

The growth of the property has been remarkable. It has been the product of a single mind from its inception to completion and has involved no loss by changes or reconstruction. Notwithstanding high war-time prices and conditions generally adverse to electric railways it has successfully withstood every strain and is now in a prosperous and flourishing condition.

Mr. Shartel was born in Harmonsburg, Pa., on May 1, 1862. Soon after his parents moved to Missouri, where he received his early education in the county schools. He was graduated from Kansas Agricultural College, Manhattan, Kan., in 1884. After leaving college he went to Topka, Kan., and studied law. Having been admitted to the bar in 1885 he practiced law in Topeka for a year and then went to Sedan, Kan. After serving three years there as county attorney in 1890 he formed a partnership with W. C. Hackney, and practiced at Winfield, Kan., until Jan. 1, 1893, when he moved to Guthrie, Okla., where the firm of Asp, Shartel & Cottingham was formed.

In 1898 Mr. Shartel came to Oklahoma City and became general attorney for the Choctaw, Oklahoma & Gulf Railroad, which position he held until 1901. Several years later he formed a law partnership with J. R. Keaton and Frank Wells, which continued until 1912, when he retired in order to devote his time to the Oklahoma Electric Railway, which he organized in 1902 and which had grown to such proportions that it required the greater part of his time.

J. W. SHARTEL

Obituary

Z. V. Taylor Dead

Z. V. Taylor, president of the Piedmont & Northern Railway, Charlotte, N. C., and president of the Southern Public Utilities Company, which operates street railway systems and other utilities in Charlotte and Winston-Salem, N. C., and Greenville and Anderson, S. C., died suddenly on the private car of J. B. Duke while en route from Charlotte to New York.

Mr. Taylor was active in the promotion of the Piedmont & Northern Railway, which was organized in 1912. The rapid growth of the road is shown by the fact that it now operates over 127 miles of track. At the time of his death Mr. Taylor was about to make extensions to the road, which had been blocked by the government's taking over the system in 1916.

The public has best understood his identity with the Southern Power Company as president of the Public Utilities Company and as president of its interurban lines. His spirit and energy permeated all branches of that organization. Perhaps the greatest business tribute paid to him was that shown eleven years ago when the Southern Power Company wanted a fair, diplomatic and astute man to give advice on those problems which confront a fast-growing corporation. He was chosen and secured for his company by winning words and a just, legal show of the facts, privileges and franchise concessions that made his services of great value.

It was in 1910 that Mr. Taylor, then head of the Greensboro Traction Company, was recognized by larger interests as a man whose ability was needed to help develop what later became the Southern Power Company. After three years at this work he and his associates formed the organization of the Southern Public Utilities Company, uniting electric and railway interests in four or five of the largest cities in North and South Carolina.

The stamina which Mr. Taylor had been able to inject into this merger of big concerns went far to make the company a success, and though tried at periods by business depressions it has never been threatened with a serious difficulty.

Mr. Taylor was born in Sparta, Tenn., in 1868. His early training was in the public schools of Oak Ridge, but later he carried on his education without school aid. He next read law under Judge W. P. Bynum at Greensboro, with whom he later formed a law partnership.

Arthur Busse, chief engineer of way and structure of the Great Berlin Street Railway, is dead. Mr. Busse was recognized as the greatest authority on track on the Continent and also was always interested and thoroughly familiar with American practices. During the last two years he had been in such poor health that he had retired from active operating duties, but his ardor for his work remained with him to the end. He was a great admirer of Theodore Roosevelt, whom he strikingly resembled.

J. Henry Meyer, president of the California Street Cable Railroad Company, San Francisco, Cal., and a director in nearly a score of large western firms, died on March 30. Death came after several months' illness. He was a native of Sacramento and sixty-six years old. As the business executive of Antoine Borel, a leading financier in San Francisco's early days, and later as an independent banker, Mr. Meyer exercised great influence in the development of the street railways in San Francisco and the street railway system in Los Angeles. Other firms thrived notably under his guidance. At the time of his death he was interested in many banking, realty and public utility companies.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Price of Trolley and Bell Cord Again Reduced

Reductions the Middle of This Month Made in Effort to Stimulate Buying —Stocks Are Curtailed

In an apparent effort to stimulate buying producers of trolley and bell cord have made further price reductions, effective April 13 and 18 in different instances. The price of cotton has been about holding its own for a considerable length of time now so the cost of material is no lower. At this writing spot cotton is quoted at 12.30 cents per pound, New York. Buying shows no improvement and producers are keeping their stocks low, though deliveries are made promptly.

The following prices are now in effect, the range representing the spread between different manufacturer's prices, and the quantity being in each case coil lots or 1,200 ft.: Bell and register cord, mahogany No. 6, 73 to 76 cents per lb.; No. 8, 70 to 73 cents; drab No. 6, 68 to 70 cents; No. 8, 65 to 67 cents; trolley cord, best grade sizes 8 to 12, 59 to 61 cents. Cheaper grades of waterproof trolley cord can be obtained at 51 cents per lb. and at 33 cents per lb., sizes 8 to 12. Mahogany trolley cord with a wire center is quoted by a leading producer at $22 per 1,000 ft. for No. 6 and $27, for No. 8 in coil lots.

Scrap Steel Market Declines During Past Month

Under Prevailing Prices Dealers Are More Anxious to Buy than Holders to Sell—Railroads Withdraw Lists

During the past thirty days prices of scrap iron and steel materials have been forced still lower than the prices quoted the last of March. Machine shop turnings have shown no change, holding at 5½ to 6 cents in net tons at Chicago, but other materials have receded from ½ cent to 2½ cents.

Prices quoted at Chicago now, in net tons, show No. 1 cast to be off ½ cent to 14-14½ cents; No. 1 R.R. wrought is down one cent to 10½-11 cents; No. 2 is down a cent to 9½-10 cents. Steel springs show a 1½-cent drop to 12-12½ cents; old steel axles have come down ½ cent to 14-14½ cents, while old iron axles have dropped 2½ cents to 24-25 cents.

For gross ton lots at Chicago, quotations are off one-half cent on car wheels to 13½-14 cents; R.R. malleable is lower by three-quarters cent to 14.75-15.25 cents and frogs, switches and guards have dropped one cent to 11-11½ cents. In the rails, old iron rails fell one-half cent to 17-17½ cents, old steel shorts fell one cent to 12-12½ cents and rerolling steel rails are lowered one and one-half cents to 11½-12 cents.

With these so-called low prices ruling at which dealers will consider buying, sellers are not anxious to get rid of their scrap as there is a feeling that an upward turn in the market is not far distant. Many buyers, on the other hand, are taking lots here and there in anticipation of a rise in market. Some railroads which had placed lists of scrap materials in the market have withdrawn these lists on hearing of the prices prevailing. Still other lists have gone through. Although buying has been light there is a better feeling in the trade since the leveling of steel prices two weeks ago. There is a reported scarcity in New York of steel car axles.

Asphalt About $8 per Ton Lower than 1920 Peak

Producers Feel that Quotations Are Close to Bottom—Good Stocks Are Held with Prompt Shipments

Prices of asphalt have hit bottom, according to the view of representative producers. The market on natural asphalt delivered hot in tank boats ranges from $33 to $35 per ton and for asphalt delivered cold in barrels from $33 to $36 per ton. On Mexican asphalt the quoted price in a representative instance is $22 per ton f.o.b. plant. The above prices represent decided reductions from the peak prices of 1920, which on natural asphalt ranged from $41 to $44 per ton. Prices have now held steady for nearly two months.

Stocks of the finished product with producers are fairly large, too much so in some instances. As a consequence immediate deliveries are generally quoted. Shipments of the raw product are prompt, the shortage which was existent last year under transportation difficulties having disappeared. Crude asphalt prices have declined somewhat as reflected in the finished product.

The volume of buying on the part of electric railways this spring has been below the level of other years, though in certain large communities there is a fair amount of activity. Demand on the part of municipalities for paving work of course represents the bulk of the buying, but the present year apparently will not quite come up to normal in that quarter either. There is a distinct tendency to hold off on making purchases and on that account producers expect business to improve this summer.

Lower Prices on Tubular Steel Poles

Recent Reduction in Steel Anticipated in Pole Prices Though Little Increased Buying Has Resulted

Inquiries in the market for tubular steel poles are numerous, it is stated, but there have been very few actual orders placed by electric railways this year. There has been some buying of combination railway and lighting poles, however, the main factor there being the insistence of merchants and municipalities that these orders be placed so as not to delay street improvement work. Several large railways have made inquiries covering their year's requirements on poles, but reluctance to buy has generally been shown because of expectations of price reductions.

In this connection an attempt has been made to check up the effect which recent price reductions on standard pipe and other steel products by the Corporation may have had upon tubular pole prices. One of the leading interests in this market states that it does not always follow that a reduction in standard pipe prices affects the selling price of poles, as on the latter product each sale is a transaction by itself so far as delivery and price is concerned. The price question in this instance is therefore left unanswered. Another large producer, however, made a decrease of $15 per ton on steel poles during February, and this cut, it is stated, more than anticipated the recent drop in the price of pipe of which poles are made. Therefore no additional reduction is contemplated from this source before the beginning of the third quarter, and no decrease will be made then unless steel prices undergo another decline.

Although present deliveries in this line are good, with shipments ranging from sixty to ninety days, prospects for improved buying are uncertain, according to producers. The view is expressed that electric railways will hardly purchase poles this year unless forced to do so by franchise conditions or extensions ordered by city councils.

Austria Asks for Car Bids in this Country

The United States Bureau of Foreign and Domestic Commerce, Washington, D. C., reports that quotations by cable are requested from Austria for twenty-four street cars, of which twelve are to be equipped with motors and twelve are to be operated as trailers. Seating capacity of the cars is to be sixteen persons, with standing room on the front platform for eight people and on the rear platform for ten. The distance between the rails is 1,445 millimeters and between the wheels 1,440 millimeters. Further information about the cars, which it is stated are urgently needed, can be obtained from the bureau or its district offices by mentioning 34,743 as a reference number.

Stranded Steel Wire Prices Follow Steel Down

Shipments Maintaining an Even Pace, but There Is Only a Small Volume of Orders

Activity in the market for stranded steel wire is not very marked at present. New construction work is not large in any field apparently, at least the volume of orders for this class of material does not show it. Shipments are being made right along, it is true, but there is no volume to the demand. A leading producer reports that orders for the first three months of this year maintained an even pace or about a million and a half feet of stranded wire shipped from New York City territory, though only about one-quarter of this was for construction work. One of the large manufacturers in this field has been out of the market altogether for the past six months, the inference being lack of buying activity.

Stocks of the finished product are large at factories, and immediate shipment can be made on common sizes. Prices on stranded steel wire declined recently in view of the drop in steel quotations. The reduction, it is reported, amounted to 10 to 15 per cent, or expressed in exact figures, $5 per ton with a representative producer.

$225,000 Loss in Pacific Electric Railway Fire

Fire of mysterious origin on April 20 completely destroyed the Pacific Electric Railway's divisional carhouse and shops at Redondo Beach, Cal., with an accompanying loss of $225,000. Besides the complete loss of the combination one-story brick structure serving as carhouse and shops, which covered half a city block, rolling stock consisting of seven of the company's heavy-type interurban cars, one city-type car, one line car, one electric freight locomotive, one box car, one flat car and one steel flat car was entirely destroyed. Several other cars were damaged; though the prompt removal of gasoline tank cars stored near by prevented more serious loss. The fire also destroyed a vast quantity of expensive repair material stored at the shops. Of the total loss sustained $150,000 was covered by insurance.

Electrification in Zanzibar

Along with extensive improvements to Zanzibar Harbor, extending over the next three years, one of the projects mentioned is a narrow-gage electric railway to run the length of the island, according to Guaranty Trust Company.

Standardization Being Discussed by Gear Manufacturers

The fifth annual meeting of the American Gear Manufacturers' Association is being held in the Hotel Sinton, Cincinnati, Ohio, April 27, 28, 29 and 30. Standardization and uniform cost accounting will be among the subjects discussed, and important action is expected by the association tending toward the establishment of a more complete standardization of the products of the gear industry.

According to the program that has been prepared G. M. Bartlett of the Diamond Chain & Manufacturing Company will discuss "The Ideal Chain and Sprocket Drive"; A. R. Mitchell of the Andrews Steel Company will speak on "Industrial Gears from the User's Standpoint"; J. B. Foote, president Foote Brothers' Gear & Machine Company, has been assigned "Worm Gearing," and J. B. Doan, president American Tool Works, has an unannounced subject.

Thirty-Mile Line Projected in China

According to the Guaranty Trust Company an electric railway line from Siangtan to Changsha, China, a distance of 30 miles, is under consideration. Plans include the possible purchase of fifteen cars.

Rolling Stock

Southern Pacific Company is expecting delivery of twelve new passenger coaches about May 12 to be placed in service on the Portland-Corvallis division about the middle of July. The cost of the cars, it is stated, is $37,000 each. The new equipment will provide surplus cars for emergency operation and to take care of excursion travel.

Detroit (Mich.) Municipal Railway, mentioned in last week's issue as placing an order for twenty-five safety cars, has issued the following information and specifications on these cars:

Number of cars ordered	25
Date of order	April 15, 1921
Date of delivery	June 16, 1921
Builder	Osgood-Bradley Car Company
Type	18 ft. safety
Weight, total	16,800 lb.
Interior trim	Cherry
Air brakes	Westinghouse DH-16
Bumpers	O. H. 6-in. rolled channel section
Car signal system	Faraday
Car trimmings	Statuary Bronze
Control	K-63
Curtain fixtures	Curtain Supply Company
Curtain material	O'Bannon double-coated, diced
Designation signs	Keystone, glass back
Door operating mechanism	Safety Car Devices Company
Heater equipment	Cutler-Hammer, truss plank
Headlights	Golden Glow, HDB-96
Lightning arresters	Westinghouse
Motors	Westinghouse, 508
Paint	Sherwin-Williams, Old Dutch, oil enamel
Registers	International, type R-10
Sanders	Osgood-Bradley
Sash fixtures	J. L. Howard & Company
Seats	Reversible slat, cherry
Step treads	Feralun
Tail lights	Nichols-Lintern Duplex indicating
Trolley catchers or retrievers	Ohio Brass
Trolley base	Ohio Brass, form No. 1
Trucks	Osgood-Bradley, 25-96

Track and Roadway

Los Angeles, Cal.—Construction of a tunnel to relieve the downtown congestion of Los Angeles, Cal., has been started and will have a considerable effect on street car travel. The bore is known as the Second Street tunnel and will run from Hill to Figueroa Streets, a distance of 1,502 ft. Car tracks have been removed from Second Street.

Detroit (Mich.) Municipal Railway.—Contract for furnishing 11,200 tons of steel rails and special work for the Detroit Municipal Railway has been awarded to the Lorain Steel Company, the only bidder on the entire equipment for which bids were recently opened. The excavation work and construction under way and contemplated by the commission are being rushed.

St. Paul City Railway, Minneapolis, Minn.—The St. Paul City Railway is to begin its 1921 paving program between the tracks at once. This proposal was accepted by the City Council. This is a matter that has been held in abeyance for a long time owing to the company's inalibity to finance the work, and even now the money will be taken from sums laid aside for other purposes. This will provide for a beginning until other funds are available.

Fort Worth, Texas.—The City of Fort Worth, Texas, has made a guarantee to the Federal Government that a car line will be built and put in operation to Lake Worth, the city resort about nine miles northwest of the city. This pledge was made to comply with one of the conditions incident to the selection of the proffered site at Lake Worth for the Soldiers' Rehabilitation Hospital to be built by the Government.

Oil Fields Electric Railway, Eastland, Tex.—An extensive system of interurban electric railways is to be built in this part of the State by the Oil Fields Electric Railway, being organized by W. Y. Fleming and associates. Preliminary surveys have been made for a line to run from Fort Worth to Cisco, through Graham, Breckenridge and other towns. Another line is to run from Wichita Falls to Abilene, through Stephenville and Brownwood. A branch line will run from Caddo to Ranger, thence through Eastland to Cisco. From Ranger a branch line will be built to Desdemona. From Cisco, lines will go to Hilburn, Rusing Star, May and on to Brownwood. Another line from Cisco will run through Putnam and Baird to Abilene. From Caddo a main line will be run to Breckenridge and will branch off to Eliasville, through Ivan, from Eliasville to Graham and from Graham to Loving, Archer City to Wichita Falls. The principal office of the company will be at Eastland.

Olympia Light & Power Company, Olympia, Wash.—The Olympia Light & Power Company expects to replace three miles of plate joints with continuous rail joints on the present 40-lb. rail.

Seattle (Wash.) Municipal Street Railway.—The utilities committee of the City Council has made a tentative decision to recommend several extensions of the Seattle Municipal Street Railway, and D. W. Henderson, superintendent, has been asked to submit new estimates on the cost of extending the Beacon Hill line to Chicago Avenue, the Alki line and the Fifteenth Avenue and Cowen Park lines. It is the intention of the committee, if favorable action is decided upon, to recommend the sale of utility bonds, and if the bonds are not readily disposed of, to give residents of the district served an opportunity to subscribe to the issues.

Willapa Electric Company, Raymond, Wash.—The Superior Court of Thurston County on March 31 reviewed the order of the Public Service Commission of Washington, requiring the Willapa Electric Company to construct and maintain an extension of its railway. On April 4 the court ordered that the order of the commission be set aside. The requirement of the commission that the railway build certain extensions was referred to in the ELECTRIC RAILWAY JOURNAL for March 5, page 474.

Power Houses, Shops and Buildings

Berlin (N. H.) Street Railway.—The Berlin Street Railway within the next month will build a new carhouse.

Charleston Interurban Railway, Charleston, W. Va.—The Charleston Interurban Railway has purchased nearly an entire block of city property and is planning the erection of a modern terminal. T. S. Clark, attorney for the company, states that the company has outgrown its present station and that the new improvement will tend to eliminate a lot of congestion which prevails under the present system of operating cars.

Cincinnati (Ohio) Traction Company.—Bids for electrical equipment of substations which will be built by the Cincinnati (Ohio) Traction Company, before the contract for power with the Union Gas & Electric Company becomes effective were submitted to the office of the Director of Street Railways, recently for approval. The Westinghouse Electric Company bid $380,000 while the General Electric Company asked $409,925. It is planned to have the substations ready for operation on Sept. 1. There will be seven substations—Price Hill, Norwood, Hartwell, Chester Park, Cumminsville, Depot Street and Twelfth and Walnut Streets.

Professional Note

The Harry M. Hope Engineering Company, Boston, Mass., has established offices in the Dominion Express Building, Montreal, to handle its Canadian business. George W. Saunders, formerly with S. Pearson & Sons, London, is Canadian manager.

Trade Notes

The Rome Wire Company, Rome, N. Y., has added weatherproof wire to its manufacturing schedule, and its new weatherproof wire mill is now completed and in operation.

The Green Fuel Economizer Company about May 1 will move its general sales office and engineering department from 90 West Street, New York City, to the factory at Beacon, N. Y. The New York sales office will remain at 90 West Street, and Mr. Brinkerhoff will continue in charge.

The Esterline Company, Indianapolis, manufacturer of graphic recording instruments, announces the appointment of Walter W. Gaskill, 141 Milk Street, Boston, as New England representative of the company.

The Stoker Manufacturers' Association, J. G. Worker secretary, Phoenix Manufacturing Company, Eau Claire, Wis., has changed the date of its annual meeting to June 14, 15 and 16 at the Red Lion Inn, Stockbridge, Mass.

The Batterman-Truitt Company, 736-8 West Monroe Street, Chicago, has negotiated a lease covering additional floors in the Gordon Building, 730-38 West Monroe Street, tripling its facilities and equipment for the manufacture of ventilating fans and blowers.

Morton Manufacturing Company, Chicago, Ill., announces the appointment of Frank N. Grigg as southeastern sales manager, with offices at 630 Louisiana Ave., Washington, D. C., to handle the sale of the company's entire "Acme Line" of railway appliances. C. H. Kadie, formerly master mechanic of the Southern Railway, is associated with Mr. Grigg as sales representative.

American Di-Electrics, Ltd., New York City, manufacturers and engineers in the field of insulation, are moving to larger quarters at 71-73 West Broadway on May 1. John P. Rockwood, metropolitan distributer, is also moving to the same address. The change will enable the company to enlarge its lines and deal in all kinds of insulation in addition to those produced in its own factories. The company's Pittsburgh agent, the Electrical Engineering & Manufacturing Company, has also recently moved to larger quarters at 907-909 Penn Avenue, Pittsburgh.

Sanford Riley Stoker Company, Worcester, Mass., announces that the sales management for Riley underfeed stokers and Murphy furnaces has been concentrated under one head. William Pestell, formerly Western sales manager with headquarters at Chicago, now becomes sales manager with headquarters at 1226 Woolworth Building, New York City. W. L. Bigelow becomes district manager of the Pittsburgh territory, while C. Lincoln Smith goes to Cincinnati in the same capacity. To serve better the territory in and around Kansas City, the F. M. Beeson Machinery Company, 308 Mutual Building, Kansas City, has been appointed sales agent for both Riley stokers and Murphy furnaces. Sales in Denver territory will be handled by the Stearns-Roger Manufacturing Company, 1718 California Street, Denver. The Boston, Buffalo, Cleveland, Detroit, Chicago, and St. Paul offices remain unchanged.

New Advertising Literature

Pumps.—"Ten Years' Progress in Water Works Pumps" is a 100-page publication of the De Laval Steam Turbine Company, Trenton, N. J.

Stokers.—The Files Engineering Company, Inc., Providence, R. I., is distributing a sixteen-page booklet covering its hand-operated Files stokers.

Bond Welder.—The Ohio Brass Company, Mansfield, Ohio, as general distributer, is circulating a folder on the Wilson Plastic-Arc Rail Bond Welder.

Steam Turbines.—General Electric Company, Schenectady, N. Y., has issued bulletin No. 42,201-B, superseding No. 42,201-A, on Curtis steam turbines of 100-kw. to 3,500-kw. capacity.

Outdoor Switching.—"The Skeet Switch and Skeet Transformer Station," an eighteen-page publication has been issued by T. J. Johnson, Jr., Electric and Gas Building, Atlanta, Ga.

Hydraulic Valves.—Bulletin No. 52 has been issued by the Wellman-Seaver-Morgan Company, Cleveland, entitled "The W-S-M Balanced Plunger Hydraulic Valve," a new product developed by the company.

Wood Block Floors.—The Jennison-Wright Company, Toledo, Ohio, has issued a booklet describing and picturing installations of "Kreolite" wood flooring blocks for machine shops, car shops, loading platforms, roundhouses, etc.

Commercial Possibilities in Africa.—National Foreign Trade Council, Hanover Square, New York City, has issued for distribution a booklet dealing with the "Commercial Possibilities of the Union of South Africa."

Hammer Drill.—Chicago Pneumatic Tool Company, 6 East Forty-fourth Street, New York City, has issued bulletin 639, on its BQ-46 Hammer Drill which is primarily adapted for demolition work such as removing pavement along rails and between ties.

Foundry Practice.—The Farrell-Cheek Steel Foundry Company, Sandusky, Ohio, has just issued a complete handbook on foundry practice which describes and illustrates each operation required in making a casting, the same casting or pattern being used throughout.

Fire Fighting and Safety Devices.—American-La France Fire Engine Company, Inc., Elmira, N. Y., manufacturer of fire-fighting equipment and safety devices, has issued edition No. 6 of its 205-page catalog on "Fire-Fighting Equipment, Accessories and Supplies," and also edition D of its catalog specifically devoted to safety devices.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, May 7, 1921 *Number* 19

Rigid Periodical Inspection Should Be Insisted Upon

THE evils of haphazard inspection, of inspection which is not thorough and rigid, was brought forcibly to attention the other day while details of a certain truck were being examined. One of the motor bearings had collapsed and broken and was on its way out of the housing in pieces. It was caught just in the nick of time by the accident that this particular truck, out of a large number, was selected to be removed for the study being made. Most properties, and this one is doubtless no exception, have a regular schedule for inspection, but since inspection is by human beings, mistakes will be made.

In this case, something was overlooked which points to the necessity of equipment superintendents and master mechanics insisting upon not only periodical inspection but rigid and thorough inspection. The mechanical side of the economies and safety of operation of rolling stock is up to the equipment men. Constant inspection to catch every fault before it becomes serious is the basis of this part of the business. This also emphasizes to the executive the value of a well trained engineer in charge of the equipment. He is always worth more than most companies can afford to pay him.

How Some Proposed Taxation Would Affect the Industry

ONE of the questions which the present Congress will have to settle is that relating to future taxation. A repeal of the excess profits tax seems to be generally demanded, partly because of its complexity and partly because, with present business conditions, it is so much less productive than during the hectic years of business ended by 1920. In its place the substitutes principally recommended have been the sales tax, an increase in the normal tax, as levied on corporations or individuals or both, and a modified tax on corporation profits.

Various forms of "sales tax" have been suggested, but a common form, if not the most common form, provides a tax of 1 per cent each time the merchandise is sold, whether in the course of the manufacture of manufactured articles, or in the course of the distribution of merchandise among wholesalers, jobbers and retailers. Thus, in any merchandise which passes through several hands, the tax would be added each time, but some of the advocates of the sales tax have estimated that this cumulative tax would not amount to more than an average of about 3½ per cent on the cost of the article to the ultimate purchaser. It is generally expected also that the tax would not be laid on sales of certificates of ownership, such as stocks, bonds or notes, or on payment for services, either personal or those furnished by utilities, or on sales of real estate.

The discussions on this tax at the recent meeting of the Chamber of Commerce in Atlantic City as well as discussions on the tax elsewhere have disclosed a considerable diversity of opinion on its merits. Generally speaking, the tax has been favored by the financial, manufacturing and retail interests of the country with certain notable exceptions, however, and has been opposed by the agricultural and labor interests, and others who have proposed other taxes in its stead. This, in fact, is the position of Secretary Mellon, whose recommendations made public May 2 include increases in corporation taxes, increased stamp taxes and licenses for the use of automobiles.

As between the excess profits tax and the sales tax, the interest in the matter by electric railway companies so far has been largely academic. Very few electric railway companies have been affected by the excess profits tax, because they had no excess profits, and the nature of their services would exempt them from the sales tax as usually proposed. In fact, it would be impossible for the electric railways to collect from their patrons 1 per cent on a 6-cent or a 10-cent fare, and it is the understood purpose of the sales tax that it should be paid by the consumer.

The effect on electric railway companies of an increase in the normal tax or of an added corporation tax on net profits would depend entirely on the form and extent of the latter tax. The most serious possibility would be any considerable tax on undivided surplus. No matter what one may think of the principle of taxing the undivided surplus of ordinary corporations, such a policy if applied to the utilities would be detrimental, both to them and the public. It is only by the use of this surplus to finance essential improvements that many companies during recent years have been able to serve their growing communities at all adequately. From one point of view such a policy has been hard on the stockholders, but they have had the satisfaction of knowing that their property was continuing to fulfill its public functions and that, in some critical cases, this plan was better than to borrow money for extensions at the very high interest rates which would have to be paid for it during these abnormal times.

Should Periodical Re-examinations of Employees Be Held?

IN THE issue of this paper for Dec. 18, 1920, there was an editorial reference to the necessity for physical and mental examination of prospective employees. This was in connection with a forthcoming report of the committee on personnel of the American Electric Railway Transportation & Traffic Association. Since that time some of the larger electric railway companies have extended the scope of such examinations with results so satisfactory that an "experience meeting" in connection with the next convention should help to impress on the railway representatives the importance of giving more attention to this feature of successful management.

It is an easy matter for a railway company to require all prospective employees to submit to a physical and mental examination before entering the service. This affords an opportunity to weed out undesirables before they have come under the protection of a workmen's compensation act and without giving them a chance to endanger the lives of passengers. It is an entirely different matter to carry out a policy of re-examination of employees after they have been working for some time. This involves the question of what to do with an old employee who has been found wanting in some serious particular as to physical requirements. Shall he be carried on a pension roll, or transferred to some less hazardous occupation, or summarily dismissed?

Adherence to a high physical standard undoubtedly would be an advantage to the riding public, to the company and to the employee himself. But if in the carrying out of such a policy a workman faces discharge after twenty or thirty years of faithful service, it is worth while to consider what can be done. Few railway companies are sufficiently prosperous to be able to set aside an adequate pension fund for employees. In some cases where the employees are strongly unionized objection has been raised by their representatives to the establishment of a company pension plan. This probably is due to fear that the men would be won over to a company organization. The alternative plan of finding work for the disabled employee in some other department would be all right until all possible jobs were filled. The last alternative of dismissing the workman meets with objections from the humanitarian standpoint, yet it is one which will have to be faced in a serious recognition of the duty owed to the public of furnishing safe men as well as safe equipment. A defective wheel or brake would have to be discarded. What about the defective employee? The subject opens up a broad field for discussion.

Is It Better to Cut Wages in a Lump or By Installments?

THE Boston Elevated Railway employees have fallen in line with those of Cleveland in accepting without strife a decrease in their basic rates of pay. Conditions governing the decrease, which amounts in all to about 10 per cent, call for its being made in installments. For men on the surface lines in service more than one year, in other words for those in this class receiving the maximum pay, the hourly wages will be decreased 2 cents per hour on July 1 and 3 cents per hour additional on Jan. 1, 1922. This corresponds to a total reduction of 7.14 per cent from the present rate of 70 cents. Elevated motormen and guards have reductions of from 4 to 6 cents per hour, also in two installments of six months each.

It is this method of reduction which makes the Boston program of especial interest. Those who favor the plan will doubtless argue that the division of the reduction into two installments more easily permits the employee to adjust his scale of living to his income, hence that the plan is a wise one. Those opposed will probably declare that where a reduction in wages is no more than in the cost of living no adjustment by the employee in his scale of living is necessary. Such changes, they argue, should be definite for a definite time and future periods can very properly be cared for on their merits whenever there is a material change in living costs.

The more general practice of using the immediate settlement plan of adjustment seems to indicate its greater popularity among railway men. But this is not conclusive, as it is not known that the installment plan was thought of and considered in other cases. It is worth examining.

Another interesting departure in wage agreements is the recent arbitration award in the case of the New York pressmen, handed down this week and accepted by both sides. This award calls for a reduction in wages of about 12 per cent and is made retroactive to April 1. Retroactive wage increases are common and there is no reason against retroactive reductions, but they are not frequent. The men expect to pay back the sum thus awarded by deductions from their payroll during May.

Philadelphia Co-operative Spirit Carries Down as Well as Up

THE present problem of effecting necessary reductions in wages, no matter by what detail it is actually carried out, places a test on the satisfactory nature of the relations of management to men on electric railway properties which is probably as severe as any which has ever been applied to this relationship. There has already been comment in these columns on some cases which have arisen, Cleveland being an outstanding one. Other recent cases are Altoona, Pa.; Albany, Ala.; Hudson, N. Y.; Saginaw, Mich., and Boston, Mass., commented on above. Another case of interest to the industry is Philadelphia, where wages have been determined according to contract with the men by averaging the rates in effect in Buffalo, Cleveland, Detroit and Chicago. The method of computing the Philadelphia wage is of course a mere mechanism and may be open to the criticism of "letting George do it," but it seems to have worked successfully.

The manner in which the men are reported to have accepted this reduction, voluntarily, is an indication, possibly, of their sense of partnership in the enterprise, certainly of the understanding of the necessity for and justness of the decrease. The way was paved for this present reduction, however, last summer when the last increase went into effect. Mr. Mitten warned the men at the time that this was all temporary and that they should consider the increase in income as "velvet" and store it away, not establishing a scale of living based on the new wage, for this was bound to come down soon.

Each property will develop its own relations in this respect largely as the result of the individual characteristics of the men on both sides. Indications are that these relations are improving all over the country, in spite of the strain on them caused by the past several years. Philadelphia's record of ten years of industrial peace, recently celebrated there at the tenth anniversary of the successful co-operative plan on the P. R. T., is one instance to prove this.

Has Paris Solved the "Incentive" Problem in Railway-City Contracts?

IT IS universally admitted that the most pressing problem before both the electric railway and its community today is to find a means of combining an attractive rate of return to the investor with a continued growth in the usefulness of the transportation system. The service-at-cost and public trusteeship plans are steps in that direction, but many of these agreements are thus far on the wrong side of the ledger and on the wrong side of the traffic count. If, then, the present agreements do not look like the last word on the subject, what can we learn from those who have had longer experience with contracts of that kind?

Fortunately, a most interesting experience in this direction has come to hand through the changes now taking place in the Paris metropolitan district. Here contracts in which fares went up or down according to traffic density were made as early as 1910. However, it seems that they failed the public before the war in producing the expected enlargement and betterment of service and that they failed the company during the war in proving flexible enough to meet the situation in wages and materials, brought about by the war. Then, too, the division of the territory among six companies, although only one dominated Paris proper, was a hindrance to progress.

It is not necessary to set forth here the detail terms of the superseded contracts and the agreement with the new State-backed operating company, as these are presented elsewhere in this issue, but it is pertinent to see what weaknesses were disclosed during the operation of these early agreements. From the public's point of view, the weakness lay in the fact that the company's rate of return depended too closely upon a definite and undesirable density of traffic. Therefore, as a business proposition, the company hesitated to do anything which would impair this density of traffic, whether in extensions of routes or shortening of headways. From the company's point of view, conditions had reached the point where the rate of return was no longer insured by bearable increases in rate of fare. The mere relinquishment of the city's percentage of gross earnings would have been but a drop in the bucket.

The community, which includes the districts contiguous to Paris, therefore found it necessary to devise a plan whereby the profit possibilities of the transportation system would be made secondary to its usefulness. Obviously, private capital could not be expected to run a transportation system on that basis. On the other hand, direct government ownership and operation did not offer any definite guarantee of efficiency. So it comes about that the plan evolved is one which places the capital invested in the leasing company upon the same plane as a government bond and elevates the management and the employees to the position of supreme responsibility for results. Now what are the results expected? Does the government expect that there shall necessarily be a surplus big enough to meet the cost of operation and all overhead, including the sinking fund payments to amortize the securities of the superseded companies and 6 per cent to the shareholders in the new company? No. The mark of efficiency will be primarily in enlarging the usefulness of the undertaking—in getting more riders; and secondarily in taking advantage of any improvements that will lower costs but not decrease service. The government frankly does not expect that the most able management will be able to show a surplus for some years to come, but it is determined to make the transportation system as valuable to the community as possible without incurring extravagance. Hence there is seen a system of awards based upon both greater usefulness and technical progressiveness.

In sum, the outstanding features of this contract, in contrast with the usual service-at-cost plan, are that the rate of return will not have to come out of more revenue from less riders at higher fares, usefulness of the mass transportation system being predominant, and that a reward for attaining this enlarged usefulness will go to those whose brain and brawn are most closely responsible for results.

Use Judgment in Welding Reclamation

EVERY one knows of the great importance and value of welding in the reclamation of electric railway equipment. Welding has virtually saved the lives of many companies, both in its ability to keep the wheels turning and more permanently in the fine economies effected. During the war the inability often to get new equipment at any price justified the use of the welder to an extent that would not be considered good practice from the standpoint of either safety or economy in normal times. Times now are perhaps not normal, but conditions have eased sufficiently so that there is no longer any need to carry the reclaiming work to the extremes that were formerly necessary. The master mechanic particularly should check up on the welding work he is having done with two considerations in mind, namely, safety and cost. The more important of these is safety, for even though an economy may be shown it is inadvisable, at least with the present limited knowledge of the art, to weld at vital points such parts as car axles, flanges of wheels used in high-speed service and other parts that are subject to high strain and the failure of which might mean a serious accident.

The principal points of breakage of axles are between the gears and hub and between the journal bearing and hub of the wheel. These points are the vital points of a car axle, and as these parts cannot be increased in size above normal, because of the necessity for a machined finish at these points, it appears inadvisable to attempt welding repairs at such locations. Until there is more definite knowledge about the molecular effect of welding upon the metal greater caution may well be used.

While one's pride may be flattered by the statement that "we never scrap anything," still it is a very easy matter to be fooled about the relative economy of welding a broken or worn piece of equipment versus the scrapping and replacing it with a new one.

Quotation from the Federal Electric Railways Commission Report

No. 19

THE commission is not pessimistic as to the future. The electric railway problem admits of a satisfactory solution, once the elements that compose it are made known and the principles of ordinary economic and business common sense are applied.

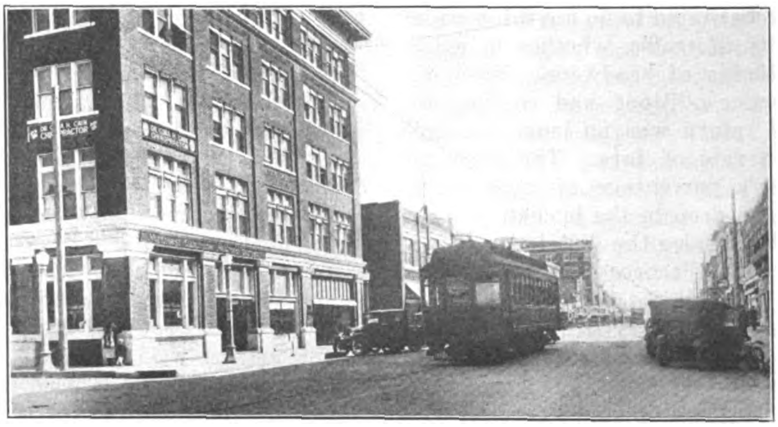
The duty both of the public authorities and of those who control the electric railway enterprises of the country is plainly indicated. The time has come for stable and satisfactory settlements of traction difficulties.

The commission can go no further than to point out the principles upon which readjustment should be based. The task is really that of the state and local authorities upon the one hand and of the companies upon the other. Failure to rehabilitate the industry and the service is possible only if those upon whom the responsibility rests fail to undertake the work or pursue it in a spirit that makes settlement impossible.

The Baby Electric Railroad Is a Buster

Recently Electrified Short Railroad Line in Northeastern Oklahoma Immediately Proves Advantages of Electrification—Gives Excellent Freight and Passenger Service to Zinc and Lead Mining Communities—Contemplates Early Extension to Much Larger System

WHAT is probably the latest member to enter the electric railway field is the Northeastern Oklahoma Railroad Company, located in the northeastern corner of the State of Oklahoma and feeding what is probably the largest lead and zinc field in the world. As was noted three or four months ago in this paper, this railway started electrical operation about the first of February this year. It had previously been a steam road, which had been operating for about eight years, but whose service had been growing more and more unsatisfactory to the mining companies. During the latter part of 1919, in order to purchase the steam railroad property, the Northeast Oklahoma Railroad Company was formed, largely from mine operators and business men in Miami, the principal terminus and location of the main offices of the company. J. F. Robinson, president of the company, is also president of the Commerce Mining & Oil Company, the largest mining group in the Miami field. The road was formerly known as the Oklahoma, Kansas & Missouri Railroad.



MAIN STREET, MIAMI, SHOWING CATENARY OVERHEAD WITH CONCRETE POLE CONSTRUCTION

The main office of the company and a passenger waiting room are in the large building in the foreground

The accompanying map gives some indication of the character of the layout of this road. The entire area shown on this map is practically as flat as a table top and twelve or thirteen years ago was Indian farm land of no particular importance. About 1911 lead and zinc were discovered and developed at and around Commerce, though there were some little developments north of that. It was at this time that the Oklahoma, Kansas & Missouri Railroad was started to handle the traffic from this new mining field to the St. Louis & San Francisco and the Missouri, Oklahoma & Gulf (now the Kansas, Oklahoma & Gulf) Railroads at Miami. During the world war the demand for lead and zinc caused a rapid expansion of this field, until at the close of the war there were some 280 lead and zinc mines operating here. Immediately these mining towns took on a new importance, for these are mining towns in the truest sense and remind one very much of the early days of Leadville, Cripple Creek and other centers of mining activity, busy with the creation of considerable new wealth. Practically all of these mines are located on land whose mineral rights have been leased from Indians, who hold title to the land under government supervision. Some of the Indians had fabulous incomes during 1917, 1918 and 1919, tales of $20,000 to $50,000 per month being not unusual. The writer had the opportunity of going over this interesting territory in March to inspect the railroad and its community. Mining activity has, of course, now ceased in many of these mines and here lie the large groups of frame houses or shacks, practically all one-story in height, making up these mining towns, with populations which are ever variable.

Miami itself has a population of about 8,000 and North Miami of 600. This is rather stable population. If a normal figure can be set on the population of the other towns, it is about as follows: Commerce, 3,500; Tar River, practically a part of Commerce, 4,000; Picher, 10,000; Century, 1,500, and Treece, a town just above the end of the spur which reaches up into Kansas, 3,000. The officials of the road figure on a population of about 45,000 on the line and in the contiguous territory. From this, records show a passenger business of about 75,000 per month.

As this territory grew, the old steam road extended its lines to many of the mines, as did also the Miami Mineral Belt Railroad, which came in from the east to tap the field. This road also has connection with the Frisco and K. O. & G., as shown.

Miami is a Western town which would surprise most people who have not been to Oklahoma. It has wide streets, 90 per cent of which are paved. It has excellent schools, is the home of one of the state mining schools, has one of the best hospitals in a radius of several hundred miles and is the trading center for a large area with which it is connected by excellent roads made from the chat which is the refuse from the lead and zinc mines. Mountains of this chat, by the way, surround each of the mines and give one the impression that the topography is not so flat after all. This chat, too, forms one of the sources of revenue for the company, for it can be secured and hauled away at very low cost for use in paving and in concrete work. Miami is also the home of a new industry of tripolite products, used for polishing purposes in the metal trade and also for facing casting molds. The great Krupp works in Essen, Germany, are said to secure their tripolite from the Miami field.

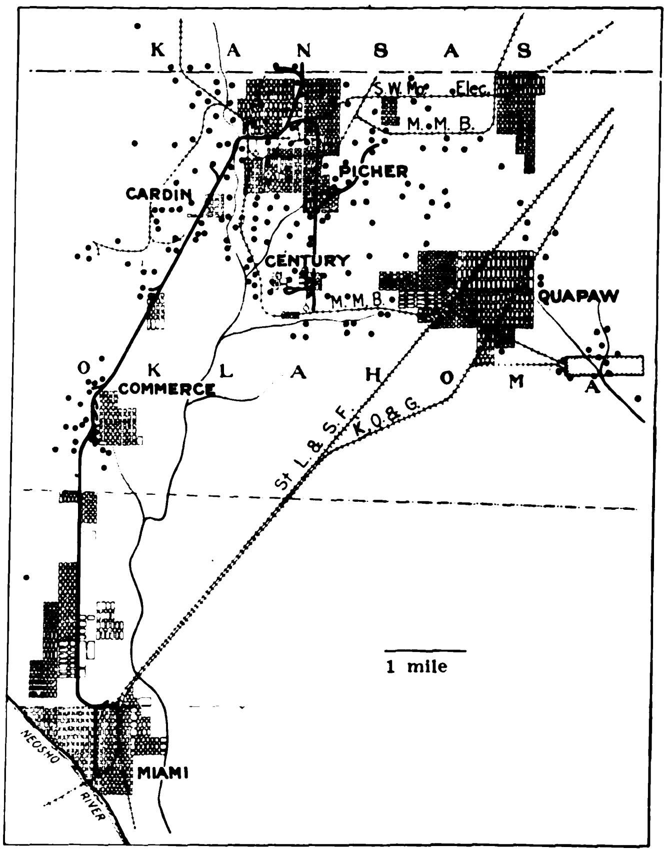
As to the road itself, the original equipment consisted of four steam locomotives, six passenger cars, used as trailers on the steam trains originally and retained as emergency trailers, and four General Electric gasoline-electric passenger cars, in addition to freight equipment described later. The steam locomotives are being put into shape to sell, except that one will probably be held to operate work trains in case of making any extensions to the system, as planned, in the next five or six years. The four gasoline-electric passenger cars are also being repaired and overhauled for sale.

The entire system has been overhauled and track regraded and rehabilitated by the new management. The rail is standard 70-lb. rail on red and white oak ties, some of which are treated. The ballast is of the ever-present chat and averages a depth of 12 in. under the tie. The maximum grade in passenger service is 1.26 per cent; in freight, 1.05 per cent; the maximum curvature on the main line is 8½ deg. and in yards 16 deg. All rail joints are bonded with 0000 strand bonds and cross-bonds of the same capacity are placed every thousand feet. The entire line is constructed on private right-of-way varying in width from 150 ft. at stations to 40 ft. at other points to suit conditions.

Necessary sidings, most of which are at least 1,500 ft. long; spurs, wyes, etc., were in the original layout or have been added so that the railroad can adequately take care of all necessary traffic.

The overhead, and all of the electrical work, is naturally new and has been added by the present management. The overhead construction, some illustrations of which are shown herewith, was designed by the Ohio Brass Company and is of the flexible catenary type. It is an example of how to put up overhead. The distribution scheme, with a substation at Picher and with one at Commerce, consists of a 500,000 circ.mil Roebling feeder cable installed the full length of the main line electrification. A 0000 grooved trolley, hard-drawn copper, furnished by the Standard Underground Cable Company, forms the contact wire and is suspended from the catenary by hangers spaced 15 ft. apart. The feeder is attached to the trolley wire every 1,000 ft. and lightning arresters have been placed at this same spacing.

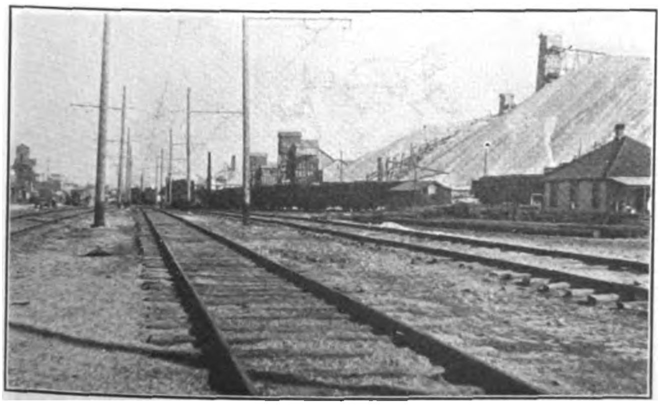
Western red cedar poles have been used, spaced 120 ft. on tangents, and on curves spaced to suit the curvature. These poles have been butt-treated, with hot application and then cold application, both brush applied. All poles are set 6 ft. in the ground, whether 35 ft. or 40 ft. in length. In the city of Miami, in place of wooden poles, reinforced concrete poles have been used both as a feature of artistic appearance and to give necessary strength. The transverse spans on Main Street, shown in one of the accompanying illustrations, are 60 ft. long, and in order to hold the overhead as rigidly as desired are under very heavy strain. The concrete poles used here are what are known as the 1,500 class furnished by the Massey Reinforced Concrete Products Company. They are 33 ft. long, with a 15-in. butt and 5-in. top, round, and reinforced the entire length with six longitudinal rods and also with annular rings of steel.



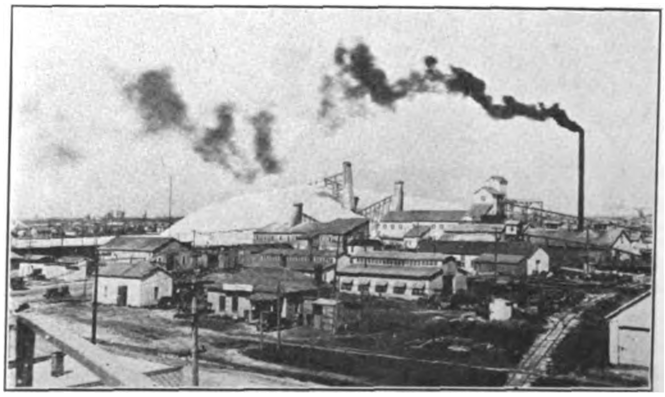
MAP OF THE NORTHEASTERN OKLAHOMA COMPANY—THE ORE LINE (INDICATED BY HEAVY BLACK LINES)

A telephone line runs the entire length of the main line of the road. To reduce interference to a minimum, this telephone line has been placed on the inside end of the cross-arm, the feeder being on the outside end; in addition to this, the telephone line is transposed every third pole.

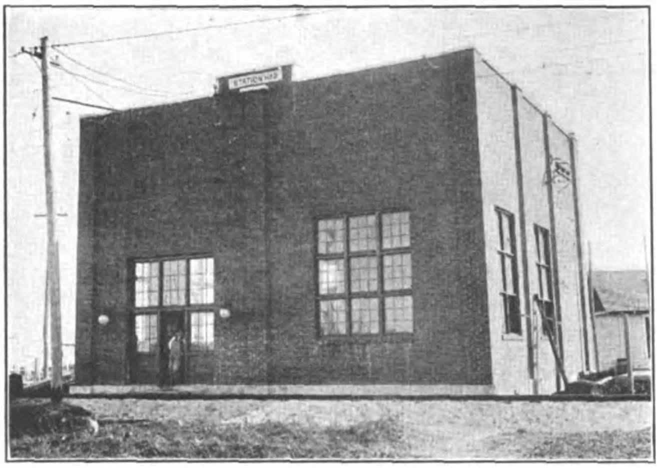
Electrical energy is purchased from the Empire District Electric Company at 33,000 volts, three-phase. In order to have equipment furnished on time, it being found impossible to get satisfactory shipping dates from manufacturers on new equipment, the substation equipment was purchased from the Cincinnati & Columbus Railway. Only one substation is now operating, but the



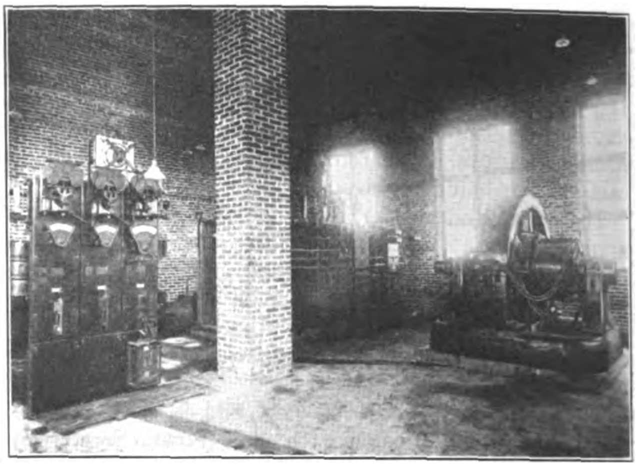
VIEW SHOWING FREIGHT SIDINGS AND OVERHEAD. NOTE THE HUGE "CHAT" PILE AT THE RIGHT



A TYPICAL MINE, AT PICHER, WITH THE NUMEROUS ONE-STORY MINERS' SHACKS IN THE DISTANCE



OUTSIDE SUBSTATION NUMBER 2—AT PICHER—NOW OPERATING



INSIDE SUBSTATION NUMBER 1—AT COMMERCE—NOT YET OPERATING

other will be put on the line very soon. The one operating is located at Picher and contains one 400-kw. G.E. converter, fed from three 145-kw. General Electric transformers. The other substation, located at Commerce, contains two 400-kw. General Electric converters and is being equipped with three 250-kw. new Pittsburgh transformers. The original transformers, from Ohio, had been used at 16,500 volts, and it proved desirable to make a new installation for satisfactory operation at the higher voltage rather than try to use the old transformers.

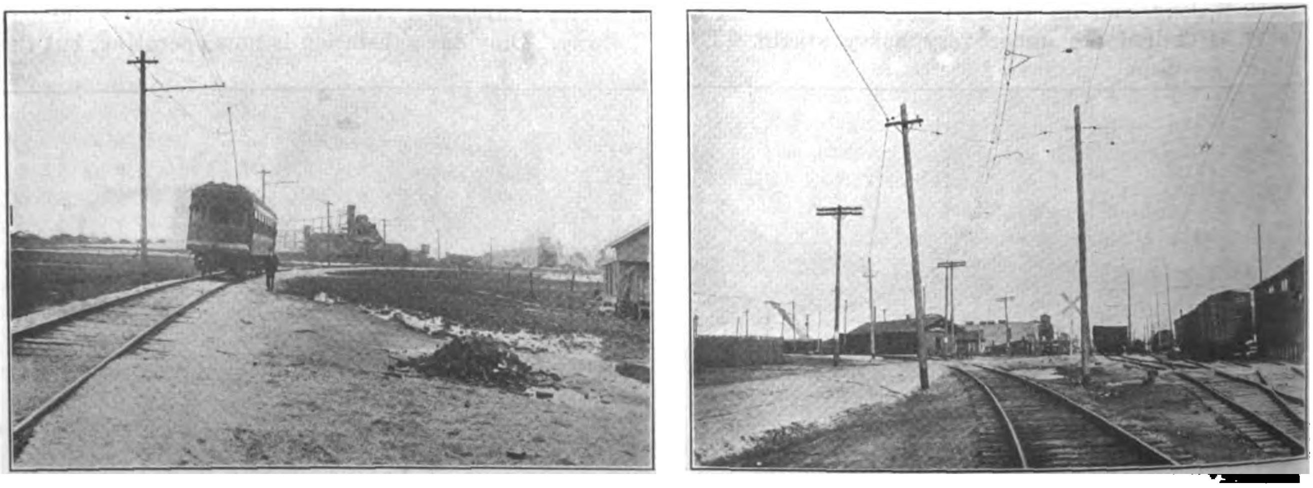
Both stations are being equipped with Westinghouse electrolytic lightning arresters. Both are equipped with Burke remote-control, high-tension switches.

The rolling stock of the company was likewise purchased from other railways, in order to secure it on time. Two large motor cars for passenger service were purchased from the old Blue Grass Line at Nashville, Tenn. These are equipped with four 100-hp. G.E. 205 motors and are of the interurban high-speed type. Four smaller cars, purchased from the Cincinnati & Columbus Railway at Ohio, are used for lighter traffic. These are equipped with four 50-hp. G.E. 57 motors. The road also has one Westinghouse-Baldwin 50-ton locomotive and the former freight equipment of the steam road, namely, ten gondolas, three flat cars, one ice car, two cabooses. The third caboose inherited from the former management has been converted into a line car. There is also a motorized package freight express and baggage car which is used for handling small package shipments.

The regular schedule calls for sixty-six passenger trains per day over the line and freight service as demanded. The passenger traffic is largely composed of miners, many of whom commute daily from their homes in Miami to the mine, and also an interchange of miners from the other towns back and forth. The average passenger car-miles per day are something over 850. The exact figures for the month of February were 24,922. Already the officials of the road have some statistics which show the advantage of electrical operation. Measured at the substation, and including station loss, conversion, etc., the watts per car-mile are estimated to be about 3.87 in passenger service. At the present cost of electrical energy, this figures about 7.3 cents per car-mile and about 0.7 cents per passenger-mile. With the former operation of motor cars, the fuel cost alone was about 18 cents per car-mile.

On the freight side February showed 2,088 loaded car-miles and 2,196 empty car-miles handled with a locomotive mileage of 629. On a basis of 40 tons per car dead load, with the weight of the car not included, the cost of coal in January figured $3.50 per car, whereas the cost of electrical energy for February figured $1.27 per car.

The passenger traffic is handled on a fare base composed of 5-cent units, with, however, a 10-cent minimum fare. The fares are, figured from Miami: To Com-



TWO VIEWS ON THE RIGHT-OF-WAY SHOWING OVERHEAD CONSTRUCTION ON CURVES AND GIVING SOME IDEA OF THE NATURE OF THE LINE merce, 4 miles, 10 cents; to Blue Goose, 7 miles, 15 cents; to Cardin, 8 miles, 20 cents; to Picher, 10 miles, 25 cents, and to Century, 13 miles, the end of the main line electrification, 30 cents. A commutation book, with 100 5-cent coupons, is sold for $4. Only about 10 per cent of the fares are paid by the use of these coupons, however.

The business of this road, as seen, depends almost entirely upon the activity of the lead and zinc industry, and particularly of the Miami field which this road feeds. Traffic in the latter part of 1920 and the early part of 1921, for instance, is considerably off from what could be considered normal. Of course, it is probably never expected that the war-time conditions of two twelve-hour shifts of seven days in the week will reappear. Road building should give some impetus, however, to traffic in this field on account of a possible demand for chat.

More than 4,000 carloads of this chat were shipped over the lines of the Northeastern Oklahoma Railroad alone during 1920.

But there are opportunities for diversifying the business of this railroad near at hand. Some 150,000 acres of coal land lie southwest of Miami; large coal lands also lie near Columbus, Kan., just to the north of the present lead and zinc field. As this territory becomes more and more developed by lease from the Indians or as the Indians obtain the right to sell the land and it becomes more attractive to outside capital there is a large territory which has no railroad facilities at all and which will offer opportunity for this newest addition to the electric railway field to expand. While no definite plans have been made, yet the management of the road realizes the situation and is awake to the possibilities of expansion, which it will probably undertake during the next four or five years.

And all of this expansion will be under electric traction, for the operating personnel of the road is thoroughly convinced of the efficiency of electrification. Compared with operation under conditions prevailing previous to electrification, the certainty of schedule, the decreased running time, the savings in power and other operating expenses, the general increased operating efficiency of the personnel itself are all features which have come on account of electrification and appeal to the management of the road.

Baltimore Tries Loading Platforms

Experimental Platforms Have Now Been in Use for Several Months—Results Show Their Value for Relieving Congestion and Also for Speeding Up Traffic—Thirteen Installed So Far

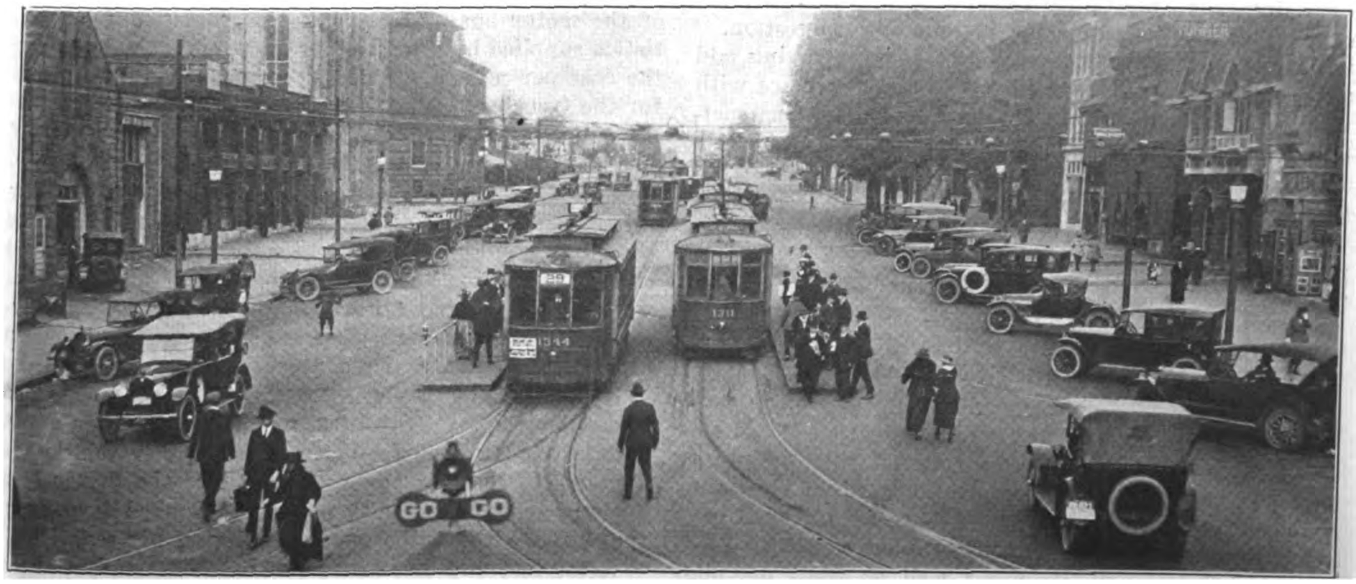
SOME months ago the subject of loading platforms was actively discussed in Baltimore between the public authorities and the officials of the United Railways & Electric Company and an experimental pair of platforms 5 ft. wide, 100 ft. long and 9 in. high were erected at North Avenue, at its intersection with Charles Street, which at this point is a thoroughfare 110 ft. wide between curbs, with the car tracks located in the center. On this pair of platforms rigid pipe railings were installed. These railings were carried 3 ft. above the level of the platform.

The results attending this original installation were very satisfactory, from the viewpoint of safety and convenience of passengers, from the standpoint of control of traffic by the police department and because of operating advantages to the railway company. Thereafter additional platforms were put in, until at the present time thirteen have been installed. A number of these were put in at the direct request of the Police Department.

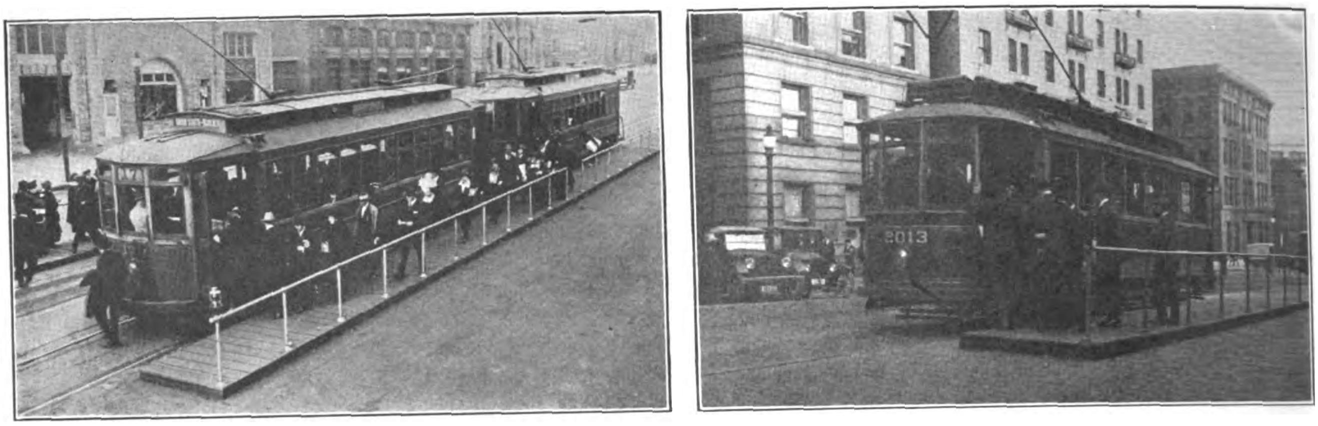
Queue loading is recognized as a very desirable and an effective aid to the rapid handling of passengers onto a car. One very satisfactory development from the use of these loading platforms has been what might be called automatic queue loading, as the comparatively narrow platform, with chains or rails on its outer edge, by its very construction promotes the unconscious adoption of the queue form of loading.

Plans were laid also for the installation of quite a few more platforms, but the Fire Department objected to their being put down in the narrower streets, because it felt that it would interfere with the operation of fire apparatus.

As a result of the Fire Department's objection the railway was unable to put platforms in at a number of locations where a study of conditions at the present time indicated their desirability and the Police Department had requested their installation. The co-operation of the Police Department has been of great assistance in successfully working out the plan, and the results from



LOADING PLATFORMS ON NORTH AVENUE AT CHARLES STREET



AT LEFT, PLATFORMS PRODUCE AUTOMATIC QUEUE LOADING. AT RIGHT, PLATFORM ON LIGHT STREET AT BALTIMORE

the public and operating standpoints have been very satisfactory.

On the original installations pipe rails were erected, but latterly chains have been used attached to upright stanchions, instead of the continuous pipe railing. This was found to be more desirable, because occasionally automobiles run into the platforms, and where the stanchions are connected by chains less damage is done than where a rigid rail extends the whole length of the platform. On the platforms and safety zones the Police Department supplies and maintains red oil lanterns during the night hours. On the ends of the platforms diagonal black and white stripes, similar to those used on railroad crossing gates, have been painted.

At a number of places where the company has been unable to get permission to install platforms because of the narrow streets isles of safety have been established. These were originally constructed with stanchions and iron pipes, making them rigid, but, for the reasons stated above, piping has been abandoned and the stanchions are now joined by chains. In some locations these stanchions had been in use before platforms were introduced, but recently the number of isles of safety have been materially increased.

A special study of traffic conditions at each location was made before platforms were laid down, and where practicable they were located around the corner from congested streets, this necessitating in some instances changing from the standard near-side stop to a far-side stop. This has been of value in relieving congestion.

The platforms are constructed of heavy planking laid on wooden sills and fastened to the street surface with drift pins. Consideration has been given to constructing them in a more permanent manner, with concrete curbs, either filled in with crushed stone or with an all-concrete surface, but for the present, until the experiment has gone further or the present platforms begin to wear out, no change will be made.

The accompanying illustrations indicate the method of locating these platforms and the additional safety which this improvement in the street car facilities of Baltimore provides for the traveling public.

Foreign exchanges record the inauguration of a trackless trolley line 1¼ miles in length and with four buses in York, England. The Bradford Corporation Tramway, which already has a number of these cars, has in contemplation a six-wheel trackless trolley bus, with seating capacity of fifty-seven, as well as some one-man buses with seating capacity of thirty each.

Trackless Trolley Demonstration

IN VIEW of the general interest in trackless trolleys, principally because of the present high cost of railway construction and competition from the motor bus, a practical demonstration of a new type trolley bus will be made at the Schenectady works of the General Electric Company the latter part of May.

A thirty-passenger type car, similar in external appearance to the front-entrance trolley car except that it has rubber-tired wheels, will be equipped with trolley pole, controller, motors and other necessary apparatus for the public demonstration. Suitable trolley wires have been strung, forming a loop for demonstration runs.

General Electric engineers estimate the cost of installing a single-track trolley line on an unpaved street as about $35,000. On a paved street, where the trolley company is forced to pay for the pavement between its rails and 2 ft. outside, the cost jumps to $75,000 per mile. The overhead for a single trackless trolley costs from $5,000 to $7,000 per mile, and where a double set of wires is strung the cost will average from $7,000 to $9,000 per mile. Comparing the operating cost with the motor bus, gas and oil costs on an average of 5 cents per mile, whereas with the trackless trolley the cost of electricity is but 2 cents a mile. The maintenance of equipment, including tires, averages 9½ cents per mile for the motor bus as compared with 4 cents for the trackless trolley. For depreciation, figuring the life of the motor bus at five years, as computed from statistics supplied by nine leading auto bus manufacturers, the cost per mile is 3.4 cents, compared with 1.9 cents for the trackless trolley, based on a life of ten years.

Totaling the above figures, the saving in favor of the trackless trolley is 10 cents per bus-mile. Figuring that the average bus runs 35,000 miles per year this means a saving of $3,500. From this amount there should be a slight deduction because of the lower initial cost of the motor bus, interest on money invested, etc., which, according to railway engineers, brings the saving in favor of the trackless trolley over its gas-driven competitor to $2,700 per car per year.

With a sliding trolley pole the trackless trolley has a leeway of 18 ft., 9 ft. either side of the trolley wires. This gives it ample facilities to pass other vehicles on the street. Directly over the head of the driver is a lever by which the trolley pole can be pulled down from the wires without the operator leaving his seat.

After test and demonstration in Schenectady the car will be sent to Richmond, Va., for trial.

Features of the New Paris Franchise

Earlier Agreements, Similar to American Service-at-Cost Franchises, Failed to Stand War Strain—New Deal Involves Consolidation of Properties, 4.9 per Cent Net Return to Investor Guaranteed by the State and Rewards to Management and Men Based on Increasing Traffic and Achieving Economies

THE city of Paris and the Department of the Seine (in which Paris is located) have approved a consolidation and refinancing of the local street railway and motor bus facilities of the most far-reaching nature. At last accounts, the new plan required only the formal consent of the stockholders of the absorbed companies before going into effect. The terms of the new arrangement will best be understood if a brief account is given of the conditions leading up to this franchise.

THE AGREEMENT OF 1910

The General Omnibus Company, organized late in 1854, was a consolidation of several small horse-omnibus companies, and soon after it was founded received a franchise for buses and also for street railways. Under this franchise, which was for fifty-five years, the company not only built a great many street railway lines and extended its bus system but had a practical monopoly of all surface transport within the walls of Paris itself, and it was the only system (except the later underground railways) with which the Municipality of Paris had actual contractual relations.[*] The exceptions to this monopoly were certain bus lines which the steam railroads were permitted to operate to carry passengers to and from their railroad stations and several street railways which were permitted to enter Paris upon payment to the General Omnibus Company of certain royalties. In consequence of this latter development there were in 1910, when this franchise expired, thirteen street railway companies in Paris and vicinity, and these companies were operating with every conceivable form of propulsion—horses, trolley, conduit, storage battery, compressed air, steam, etc.

In 1910 the Municipality of Paris concluded an agreement with the General Omnibus Company which contained a number of features of general interest, aside from the provisions for motorization of the buses and electrification of the street railways, partly to trolley and partly to the conduit system, the latter being compulsory within certain areas. Among these features were the following:[†]

Change from Unit to Two-Fare System within City.—Although there had been no startling rise in costs by 1910, the General Omnibus Company seems to have realized that a continuation of the unit fare with free transfer was uneconomic on a system with an ever-growing increase in average length of ride. The unit fares of 15 centimes (3 cents) second class and 30 centimes (6 cents) first class (the latter including transfer privilege) were replaced by a zone system in which the base fare was 10 centimes (2 cents) second class and 15 centimes (3 cents) first class.

Capitalization.—The capital of the General Omnibus Company was increased from 17,000,000 francs to 80,000,000 francs to take care of the reconstruction and electrification expenses. The company was required to set aside annually a sum amounting to not less than 5 per cent of its net profits to retire each year a portion of its stock, though the holders of the stock thus retired received "participation" certificates, entitling them to share in the profits after an initial dividend of 5 per cent had been paid on the unamortized stock and also to participate in any surplus after all stock had been retired at par when the company should be liquidated.

Return to the City.—In the agreement prior to 1910, the return to the city appears to have been confined to the usual paving upkeep tax and a tax based upon the number of cars. The agreement of 1910 retained the paving charge, but replaced the car tax by a charge on gross earnings. It was agreed that the bus system should pay the city 3½ per cent of gross earnings, with a maximum of 4 per cent if the receipts exceeded a certain set figure. On the other hand, the street railway system was to pay 3½ per cent minimum, if the return to stockholders was not more than 5 per cent, up to 6 per cent maximum according to the increase in return received by the stockholders. The city could call for a reduction in fare if the earnings per car-mile or bus-mile exceeded 32 cents and 33 cents respectively. This figure was based on the size of car then in use, but was to be changed according to a specified formula if cars of different capacity were put in service. The bus contract stated that the company would not be obliged to install certain additional routes until the average earnings per bus-mile attained a stated figure. So, too, the company was entitled to apply for higher fares if the average earnings fell below 33 cents per bus-mile, provided it operated a stated minimum mileage per annum. If all such payments to the city plus the local fuel tax (octroi) exceeded 6 per cent of gross earnings, the General Omnibus Company could apply for a reduction.

Full Regulation Retained.—The Municipality of Paris retained all rights to regulate routes, timetables and fares and to exert other police powers, such as approval of rolling stock and other equipment affecting the public safety and convenience. The company's accounts were to be audited by the city, city inspectors were to be carried free and the company was to pay all regulatory expenses up to a stated maximum per mile of route. Fines and forfeiture clauses to put teeth in the regulatory ordinances were also provided.

WHY THE 1910 AGREEMENT BROKE DOWN

The three or four years following the 1910 agreement, including the change to zone fares, saw heavy increases in traffic despite the large amount of reconstruction going on and the growing competition within old Paris of the underground railways. The public, however, felt that the company was not expanding its facilities and improving its service as had been anticipated. In all likelihood, the extensive rebuilding program of the company did not tempt it to develop experimental services which would lower the average return per vehicle-mile to uneconomic levels.

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[*] For further particulars of this franchise see STREET RAILWAY JOURNAL, January; 1897, page 16; May, 1899, page 275, and Jan. 4, 1902, page 18.

[†] For further particulars of this franchise see ELECTRIC RAILWAY JOURNAL, Oct. 1, 1910, page 505.

With the arrival of the war in August, 1914, all progress naturally had to cease. In fact, it was necessary to make tremendous cuts in service because of man-shortage and other difficulties incident to the war. By 1916, also, the increase in wages, fuel and materials had become so great that the company applied for relief. It was not until 1918, however, that the first increases in fare were granted upon recommendation of a commission which had been appointed by the Prefect of the Department of the Seine to study both the matter of immediate relief and a permanent settlement.

TERMS OF RECAPTURE AND CONSOLIDATION UNDER GOVERNMENT AUSPICES

At this time there were six surface systems in the Paris metropolitan area as follows: The General Omnibus Company, Tramways-Nord, Tramways-Sud, Est-Parisien, Chemin-de-fer-Nogentais and Rive-Gauche, with a total of 943 km. or 584 miles of route. The capital investment of these companies totaled 420,900,000 francs, or approximately $81,000,000 at prewar exchange. The General Omnibus Company alone constituted practically one-half of this total. Both the city and the department were agreed that unified operation of all these lines was the indispensable basis of any post-war arrangement. To purchase these lines outright and operate them jointly offered a host of administrative entanglements.

Aside from this it did not seem feasible to the dominant political parties to go to direct community operation if it were possible to devise a plan whereby the business management of the lines would be retained without injury to the life and business growth of the community.

A plan was finally worked out and proposed which was built on the basis of private management. Following this plan, a contract was first made by the department with the city to reimburse the latter for payments in taxes, etc., which it would have continued to receive under the old franchise. Also by agreement with the city, the department purchased from the General Omnibus Company as of Jan. 1, 1921, all franchises and such properties and equipment as were of direct use in operating the lines. A special clause in the agreement reserved for the city council all powers necessary for the fixing and modification of schedules, fares and routes. Certain supplies, cash on hand and in bank remained the property of the company, but the supplies, under the terms of agreement, could be purchased at cost of manufacture. The terms of sale were to be fixed by a group of experts, three named by the Minister of Public Works, three by the company recaptured and three by the unanimous consent of the first six. In case of failure to choose the last three, the judges of the Court of Appeals were to be asked to name the additional experts. The payment was to be made in sixty semi-annual installments and, in accordance with rules applying to properties operated fifteen years or more, was to be based upon the net average earnings of the best five years out of the last seven years preceding the sale, but in no case was this amount to be less than the net receipts of the last of the seven years of the test period.

The capitalization of the companies included was:

	Capitalization, Francs
General Omnibus Company	200,000,000
Tramways-Nord	81,300,000
Tramways-Sud	65,200,000
Est-Parisien	41,400,000
Nogentais	21,000,000
Rive-Gauche	12,000,000

THE LEASE AND THE LEASING COMPANY

While the actual contract with the leasing and operating company is made by the Department of the Seine, the city and the department have an agreement for the purpose of retaining for the city such rights as "long possession confer and vital rights demand." By this agreement a certain exchange of jurisdiction is also accomplished so that the city obtains additional jurisdiction over departmentally licensed railways within the city limits and the department over parts of municipally franchised lines which extend beyond the limits.

Most important of the provisions which form Article 3 of the covenant between the two are: The department shall endeavor to make such modifications of tramway lines within the city limits as the city council may demand by special resolution, after consultation with the commission which will supervise the working clauses of the lease; a similar provision regarding autobus routes; an agreement to submit all such changes proposed by the department to the city council; and the city fares cannot be raised or lowered without a special joint resolution of the municipal council of Paris and the council of the department.

The city is also to be the judge as to standards of line, track and paving upkeep, and is to receive certain costs plus a 10 per cent or 15 per cent payment from the company for work done in connection with these matters. Snow removal costs are to be shared equally.

The operation of the superseded companies has been taken over through contract with the Department of the Seine by a new company formed under the direction of Andre Mariage, director-generator of the General Omnibus Company, subject to various conditions as set forth July 12, 1920, by the Prefect of the Seine in a statement to the municipal and departmental councils, and abstracted herewith:

The leasing company is to have a capital of 60,000,000 francs, of which 6,000,000 francs is to be a guarantee fund, provision being made for increasing this fund as the mileage of the railway and bus routes is enlarged. This 6,000,000 francs must be invested in city of Paris bonds or other similarly stable securities approved by the department. The stockholders of the former companies have the first right to subscribe to the new company's stock on an equitable pro rata basis.

The company is to be guaranteed a gross return of 6 per cent on its investment, but the actual return, after income tax deductions and the like, is 4.9 per cent, which is less than the current rate of return on French government bonds.

The department expects that deficits will prevail for some years to come, but it does not wish the company's management to do anything that will limit the usefulness of the system to the public. It has therefore provided two forms of incentive for the operators.

A Reward for Increased Business.—In addition to the guarantee the company is to receive a bonus for increasing the gross receipts. This bonus is 0.75 per cent of the annual gross receipts up to 250,000,000 francs and 1 per cent of the gross receipts in excess of this amount. From this fund must be paid the salaries of the executive officers and of the directing board and inspectors of accounts. Good management is defined as consisting, in effect, of serving the largest population possible; and it is added that any economies realized must not result in a reduction in the number of passengers. (The actual French for the last eight words reads "de la compression des voyageurs!" The rank and file employees will receive a premium equivalent to 4 per cent of the gross receipts from traffic and advertising.

A Reward for Operating Economies.—The company will also be entitled to reward for any operating economies that do not lower the standard of service. This reward may be expressed by the formula: $0.04 \times (R - 0.65\,E)$ in which "R" represents the gross receipts and "E" respresents "operating" expenses as defined hereinafter. Out of this fund, 300,000 francs a year must be placed in a special reserve fund until the latter attains 3,000,000 francs and it must be kept at that amount. The purpose of this reserve is to have funds to make payments to the guarantee fund as the lines grow and to pay any penalties which may be levied against the company.

If the earnings, after subtraction of the awards, permit an 8 to 10 per cent dividend on stock or addition to surplus the extra above 6 per cent is to be divided between the department and the company. If there is enough to pay 10 per cent or more, the department will get three-fourths of the remainder.

ACCOUNTING METHODS

The accounts are divided under three heads as follows:

Financial, operating and remuneration. "Financial" covers all charges relating to the recapture annuities, certain minor war annuities, interest on reconstruction loans advanced by the department, etc. "Operating" not only includes the usual items connected with running a transportation system, but also include the cost of governmental regulation, of certification of accounts, of amortization of new investment in thirty years, of interest on guarantee and reserve funds, insurance, maintenance, renewals, and generally of all items not included under "financial" except the 6 per cent guarantee on investment and the efficiency awards which come under the head of "remuneration."

The company in taking over the properties guarantees to leave all employees undisturbed in their wages, seniority, privileges, etc., reserving merely the right to make changes in the case of employees receiving more than 25,000 francs per annum. It also agrees to continue the system of Workers' and Discipline Councils which were a characteristic of the General Omnibus Company's relations with its men. All employees must be French and must be chosen, so far as possible, from those who have lived at least three years in the Department of the Seine or in the contiguous departments; in the case of the latter the proportion of employees engaged should be in proportion to the mileage in their native department.

While the lease is for thirty years, the Department of the Seine reserves the right to annul the contract any sixth year upon two years' notice. In this event, the company will be reimbursed by the department for any capital not amortized and will receive the following amounts which are intended mainly to indemnify the executive officials; possibly to liquidate long-term contracts with these officials:

2,000,000 francs if annulment occurs Jan. 1, 1927.
1,750,000 francs if annulment occurs Jan. 1, 1933.
1,500,000 francs if annulment occurs Jan. 1, 1939.
1,000,000 francs if annulment occurs Jan. 1, 1945.

The Prefect of the Seine will form a consulting board made up of an equal number of representatives from the city and departmental councils plus representatives from the company, various government departments, commercial and labor bodies, etc., but these outside members must not outnumber those from the two councils. The chairman, also named by the Prefect, will cast the deciding vote in case of equal division. The functions of this board are purely advisory and cover only such topics as the Prefect assigns to it for consideration. This commission will study the allocation of the 4 per cent gross receipts bonus previously mentioned.

A more important commission is the control board made up only of representatives from the two councils and the administrative staff of the Prefect. This board will be the actual regulatory body so far as operation, audit and changes in executive personnel are concerned.

Trackless Trolleys in Germany

A RECENT inquiry in regard to trackless trolleys in Germany shows that before the war there were only three such lines in that country, one in Saxony, one in South Germany and one in Westphalia. Of these three lines only the first mentioned is now in operation, while the two others stopped work during the war. These three lines had only a total of 12 miles. The line now in operation is used as an auxiliary extension to the electric railway system of the town of Wurzen in Saxony. The two other lines served as communications between small towns.

As to financial results, the cost of installation was found to be only one-fourth to one-third of an ordinary line with tracks, but the maintenance of rolling stock cost 25 per cent more. The running expenses were found to be somewhat lower than in the case of motorbus lines. A prime condition of the trackless trolley is a well-paved road surface and no attempt has yet been made to use this form of traction with unpaved roads. The cost of installation of the overhead wire before the war was 16,000 marks per mile, and is now from 100,000 to 160,000 marks a mile.

The line in Saxony is using cars of 3 tons in weight, with space for from twenty to twenty-four passengers, ten to fourteen of whom can be seated. The cars have solid rubber tires. In times of ordinary traffic they are run with one man. The cars are using a short-circuit brake, trolley poles of the most simple design and motors of 15 to 25 hp. with worm drive. The cost per car before the war used to be 40,000 marks and is now 100,000 to 125,000 marks. The present wages paid to the attendants on the Wurzen line are 5 to 7 marks per hour. The fare, which before the war was only 5 to 10 pfennigs, has, in the case of the one line in operation, risen to 30 pfennigs. Only in one case are data given as to total cost of running operations and revenue per kilometer. The first was 21½ pfennigs, and the second 24½ pfennigs in 1912. The German Street Railway Association, which collected these data, declares that trackless trolley lines have found little favor in Germany and there is no likelihood of their development in the future.

No Reason to Change Standard Birney Safety Car Design

An Analysis of the Situation Is Convincing Proof that the Present Standard Should Be Retained Until Some Definite and Reasonable Arguments Are Forthcoming

By W. H. Heulings, Jr.
Vice-President and General Sales Manager the J. G. Brill Company

THE article by J. C. Thirlwall, General Electric Company, which appeared in the April 16 issue of the Electric Railway Journal under the caption "Why Alter the Standard Safety Car Design?" was an excellent presentation of sound and sensible facts which deserve the thoughtful attention of all officials of street railways having safety cars in service or in contemplation.

The advantages of standardization to railway companies are so great that every precaution should be taken that no change in safety car design should be requested which will destroy the manifold advantages of the present standard design by increasing the weight of the car, the cost of operation and the cost of production and by lengthening the time of delivery.

Will Build Special Safety Cars

The J. G. Brill Company built the eight special double-door safety cars for Madison and the four double-door cars for Lancaster, these being the only cars out of 2,839 safety cars our plants have built which have double doors. The remaining 2,827 cars have the standard single door and are responsible for the remarkable savings and earnings which have been attributed to safety cars generally. We do not recommend anything but the standard Birney safety car as designed, but where demanded we will make changes at a higher cost and longer delivery, but we certainly advise against such deviations from standard.

Smaller Cars and More of Them

From reports received from Madison it is evident that both the public and the railway company are satisfied with the double-door arrangement on the cars which we built for them. It would be foolhardy to deny that the simultaneous ingress and egress of passengers is quicker than with the single door, but what does this amount to? If the time saved is sufficient to warrant the additional expense and the loss in power saving which results from the increased weight, then the double-door car possesses an economic advantage. This is, in my judgment, very uncertain; in fact, I should almost say, "It certainly is not." Our experience with the safety car indicates that railways making their installations on ratios which mean more frequent service to the public have had the best results, and there is no overcrowding as there is sufficient space for the standing passengers on each car.

Public Must Be Considered

In installing safety cars on a car-for-car basis advantage is taken by the operating company of the saving in platform wages and power consumption, but the public loses car space. They may get the same number of seats, but if the same number of standing passengers are jammed into a smaller space naturally they'll be dissatisfied and no one can blame them for kicking loud and long.

It is true that Madison tried out five standard Birney safety cars but, as stated in the March 12 issue of the Electric Railway Journal, the installation was made on a car-for-car displacement basis. This should certainly be taken into consideration when analyzing the safety car experience in that city.

Safety Car Must Be Small

To increase the length and other dimensions of the standard safety car is simply to defeat its object. In order that operating companies may reduce headways to compete with other forms of transportation by running more cars it must be possible to do this at less total cost than previous service, and this is only possible with the use of smaller light-weight units.

Mr. Thirlwall referred to another installation where the manager of the road changed some of his cars to a double-door platform type. This company had already improved its service by reducing its headways and it was only the desire on the part of the manager to speed up loading and unloading by the simultaneous ingress and egress of passengers that prompted him to convert these cars to a double-door arrangement. He soon found that the advantage in loading and unloading time gained was offset by other difficulties which are attendant to double-door operation on one-man cars and then rechanged his cars to the smaller standard single-door platform.

It is therefore evident that there has really been no convincing argument advanced that a change of the standard design of the Birney safety car to a double-door platform arrangement would satisfactorily meet general operating conditions and at the same time retain for the railway companies the maximum economies in initial cost and in cost of operation.

The city of Terre Haute, Ind., has certainly made a success of safety car operation, and since the safety cars have been in service this city has been visited by railway managers not only from cities in this country but also from foreign countries, and the fact must not be lost sight of that, during the course of an address at the convention of the American Electric Railway Association in Atlantic City last year, E. M. Walker, general manager of the railway lines, stated, "We attribute our success with safety cars principally to the fact that we have stuck religiously to the standard car."

Changes Proposed in British Classification

A COMMITTEE of British accountants of tramway undertakings has been considering revisions in the standard form of tramway accounts. The present form was drafted in 1904 by a joint committee of the Institute of Municipal Treasurers and Accountants and the Municipal Tramway Association, and since has been adopted by practically all municipal tramway undertakings and some of the companies operating tramways. Time has shown that different interpretations have been placed upon the directions given in the standard form. In consequence, the municipal tramway managers at Leeds, Sheffield and Manchester and the London group of company-owned tramways arranged for a conference of the accountants of those organizations. The accountants met in December of last year and have now recommended some alterations and additions to the standard form, without, however, fundamentally changing it.

Lists of accounts were also recommended for motor bus operation and trackless trolley operation.

The Engineer and Eminent Domain*

Legal and Engineering Problems in Condemnation Procedure Analyzed and Various Pitfalls Pointed Out—Determination of Advisability of Condemnation Sometimes Difficult—Complete History Is Given of One Condemnation Case, with All Documents

By CHARLES R. HARTE
Construction Engineer the Connecticut Company, New Haven, Conn.

EMINENT domain is the right or power of a sovereign state to appropriate property to particular uses for the purpose of promoting the general welfare. Whether, as was said by the Supreme Court of Connecticut, it "is a reserved right attached to every man's land, and paramount to his right of ownership," or whether, as is more generally held, it is a power which the state may exercise for the welfare of the community, is of much less consequence to the engineer than the fact that there is a power by which property needed to promote the general welfare of the public may be taken from the owner when for any reason he is unwilling to dispose of it at a fair price. Unlike the police power, however, which regulates the use and enjoyment of a man's own property by himself so that he shall not interfere with the general welfare of his community and compels him to submit, without compensation, to any inconvenience or loss he suffers in consequence of that regulation—the Volstead act being a shining example—eminent domain is a forcible exchange, and the taking can be effected only when just compensation is made to the owner.

THE LEGAL SITUATION

The power is a legislative one and may be delegated by the Legislature, to any one properly authorized, to promote the general welfare of the public. Unfortunately, however, the courts have been by no means agreed as to just what is such a proceeding, and while the Legislature delegates the right and must therefore decide upon what it considers a public use, the correctness of this opinion is subject to the decision of the courts, and as one perplexed judge said, "No question has ever been submitted to the courts upon which there is a greater variety and conflict of reasoning than that presented as to the meaning of the words 'public use' as found in the different state constitutions regulating the right of eminent domain." A striking example of this difference of opinion is seen in Connecticut and Rhode Island decisions. In the first state a transmission line between the power and substations of an electric railway is a public use, and, provided of course the company is authorized to exercise the right of condemnation, the necessary right-of-way may be taken by eminent domain. In the sister state just east, however, "that which pertains simply to means of supply is the private business of the company," and the Rhode Island Suburban Railway was consequently unable to exercise the power that way. And because the power is an unsuual and a "harsh" one, the courts quite generally have been very critical both to be sure that the company or person actually had been delegated the power and that its exercise was in strict accordance with the rights it had.

From the legal standpoint, then, in case condemnation is under consideration, it is essential to know, first, whether the company actually has received the right from the Legislature; second, whether the proposed use of the property desired is one which the courts of the state in which it is, have accepted as "public," or, at least, is not one they have classed as a "private" use, and, finally, that the proceeding itself is in strict accordance with the requirements of the state. It is therefore highly important that the legal advisers be not only good lawyers but that they be also familiar with condemnation proceedings as administered in the state involved.

IS CONDEMNATION WISE?

Before condemnation proceedings are started, it is well for a company to consider what is involved and what is to be gained.

In delivering the opinion of the United States Supreme Court in the Minnesota rate cases, Justice Hughes said of the railroad: "It is equipped with the governmental power of eminent domain. In view of its public purpose it has been granted this privilege in order to prevent advantage being taken of its necessities. It would be free to stand upon its legal rights, and it cannot be supposed that they would be disregarded."

Unfortunately, while this is perfectly true from the legal point of view, it disregards a practical fact that is often of the greatest importance. Under favorable conditions the proceedings may be short and sweet, and in a few states after a preliminary hearing the company, upon depositing an approved bond with the court, may proceed with the work while the lawyers fight out the questions of the final settlement. In the large majority of the states, however, it is possible for the owner to prevent possession for a very considerable time. If the proceedings have been started well in advance of the date on which the property is necessary, this may cause but little trouble; more usually these cases arise at the last minute. Of course, if the owner refuses to sell on any terms, and the project is not to be abandoned, there must be condemnation or relocation. Such cases, however, are comparatively rare. The trouble usually arises over the amount. It then becomes an interesting question what to do; namely, (1) condemn, and have the expenses of the proceeding and the interest on the investment kept idle until possession is obtained, and in many cases the increased cost of the work which has to be done in an adverse time because of the delay to be added to the award for the land, or (2) pay out of hand the price asked and save the costs and annoyances of the holdup, but establish a precedent which may make trouble later on, and is unfair to those who sold at a reasonable price.

At the time of the Minnesota rate cases, although every one who had had experience in buying right-of-way knew that its cost averaged materially higher per acre or square foot than similar adjacent land, there were available no definite proofs of the claim made by Mr. Cooper of the Northern Pacific, that while city land cost but little more per unit when bought for right-of-way than for other purposes, farm lands averaged in cost three times as much for the one purpose than for the other. The court refused to accept his belief, but recent investigations in connection with the federal valuation of the railroads, however, indicate that Mr. Cooper was quite right. In view of the facts that the ratios for the several classes of land do not materially vary in different parts of the country, it may fairly be considered that the costs of condemnation and the consequent delays, but not including the normal price of the land condemned, in the case of farm lands are at least double the normal price of all the farm lands of the right-of-way; that in the case of suburban land the extra cost is equal to the normal price, while in city land the excess is about one-fourth, normal price referring to the price which would be paid for similar land in ordinary parcels and sales.

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*See "The Engineer and the Right-of-Way," by Mr. Harte, ELECTRIC RAILWAY JOURNAL, June 26, 1920, page 1301.

The moral of this is that condemnation is expensive, and the possibility of adjustment in a different way should be carefully considered before it is employed.

THE ENGINEERING SITUATION

If it has been decided that condemnation must be resorted to, the engineering features demand consideration. While there are wide differences of opinion as to many legal features, the authorities are quite generally agreed that the actual taking must very closely follow the petition.

If the taking describes a strip of sufficient width for all structures there will be little difficulty provided it is not held unnecessarily large—some of the states are very strict in this respect—but particularly in the case of a transmission line; locations for the individual poles, guys and other elements can usually be obtained with far less trouble and expense, and if the description is properly made and includes right of access, such a taking serves as well as a strip unless changes are necessary at a later date.

Just what should be included in the description depends upon the attitude of the courts. In some states it has been held that the right of the company to exercise the power of eminent domain should be most carefully considered, but once its right to employ it is established the intent of the Legislature rather than a literal interpretation should be considered. In others a most exact compliance with all the forms has been insisted on. As it is desirable to have the taking as elastic as may be safe, this is a matter which calls for close co-operation between engineer and counsel, and the former should not forget that the owner's title extends above and below the surface of the ground, and that the wires between the poles, the overhang of the cross arms, and the underground portions of anchors and braces occupy the property no less than the poles themselves, and, further, that the right of location does not of necessity carry with it the right of entry at a later date for the purpose of maintenance and replacement. Still further, it should be remembered that a long pole cannot be taken around a sharp bend in a narrow right-of-way without overhanging adjacent land and that a right of access to the line for the purpose of maintenance may be held to apply only to the land of the grantor, and not to give the right to team or go over it to reach a part of the line on other land unless it is so stated. Finally, not only should there be set out the right to trim to a definite distance from the center line all existing trees, but it should also be borne in mind that old trees grow and new ones are planted from time to time, and the right should definitely provide for proper future trimming. In New York "the right to trim such trees as may be necessary to protect said line from interference" was held too indefinite a statement to permit the determination of the damage to be compensated for.

It should not be supposed that every case of condemnation involves such complications, however. Probably in nine cases out of ten, even with a very faulty taking, no questions will be raised, but in case of trouble the matter may prove very serious, as there have been decisions holding that one condemnation exhausted the power, and it is the part of wisdom to be sure rather than sorry.

THE ACTUAL TAKING

The details of the actual taking differ materially in different states, but there are certain general features common to nearly all. It is generally necessary to state that the parties cannot agree upon a price, and there must be a vote by the proper parties that the property in question, so described as to definitely fix it, be taken. Thereafter come such hearings, viewings, determination of damage, awards, appeals, and final decisions as may be required by the state in which the land or property is located.

It may be of interest to see just what steps were followed in a case in Connecticut, where, however, the award was not appealed.

PROCEDURE FOLLOWED IN CONNECTICUT

In 1917 the Connecticut Company found it desirable to build a transmission line between New Haven Station "A" and North Haven, and having made a location, on July 21, 1917, filed with the Public Utilities Commission a petition (Exhibit I) for the approval of the location and the method of construction, whereupon the commission appointed (Exhibit II) a date for a hearing when all parties might be heard, and, following the hearing, made a finding of approval (Exhibit III).

Most of the desired location was secured with little trouble, but one John S. Palmer, while not hostile to the company—in fact, the action was rather a friendly one—asked a price which seemed all out of reason. Accordingly on Nov. 3 the directors of the Connecticut Company voted (Exhibit IV) to locate upon and take the necessary land. The petition to the commission for the taking asked a reapproval of the plans, since the first plan did not show the necessary detail for condemnation. This petition and the notice of a hearing on it were repeated in the finding of necessity (Exhibit V). Then followed a petition (Exhibit VI) to the Superior Court to appoint appraisers; the court order (Exhibit VII) for a hearing on the taking; the hearing, at which appraisers were presented to the court and accepted (taker and owner each select one and these two choose a third); the formal court approval (Exhibit VIII); the trips of the appraisers to the spot to view the land and determine the damage; and, finally, the return (Exhibit IX) of the appraisers to the court, which has the effect of a court judgment. It will be seen that from the vote of the directors on Nov. 3 to the judgment was a trifle over sixty days. This was a friendly suit, speeded by all, with no appeal. In the Stevens case, also in Connecticut, the matter was dragged out for five years.

Documentary Exhibits in the Palmer Condemnation Case

Exhibit I—Petition for Approval

TO THE HONORABLE PUBLIC UTILITIES COMMISSION OF THE STATE OF CONNECTICUT.

The petition of the Connecticut company respectfully represents:

1. That it is a company organized and existing under and by virtue of a charter granted by the General Assembly of the State of Connecticut, for the purpose of constructing and operating street railways, and having its principal office at New Haven in said State.

2. That it has the right to construct a transmission line consisting of two circuits, each of three stranded 2/0 copper cables on porcelain insulators with metal pins bolted to 3⅝ x 4⅝ yellow pine cross arms having angle iron braces, all on "Class B" chestnut poles, details being shown on the attached sketches, said line to run from Station A of said Connecticut Company in New Haven on the poles carrying the present Branford transmission line as far as Middletown Avenue, New Haven, and thence on private way and along and across highways as shown on the accompanying plan to the North Haven substation of said Connecticut Company.

3. That it has caused to be made a plan showing the highways in and through and over which it proposes to build said transmission line and also detail plans showing the construction at highway, railroad and wire line crossings, which first named plan is entitled, "The Connecticut Company—New Haven Lines—Office of Construction Engineer, New Haven, Conn.—Proposed transmission line—Station A, New Haven to North Haven substation—Scale 1:20,000 Date July 21, 1917," and which detail plans, of which four show pole top construction and twelve show crossings set forth in their respective titles, the location of each kind of construction and of each crossing.

WHEREFORE, it prays your Honorable Body, after public notice and hearing thereon, to accept and adopt said plan, and make all necessary orders to render available the location of said transmission line and its structures as approved by your Honorable Board.

Dated at New Haven, Conn., this twenty-first day of July, 1917.

THE CONNECTICUT COMPANY,
by Charles Rufus Harte,
Construction Engineer.

Exhibit II—Notice of Hearing by Public Utilities Commission

PUBLIC UTILITIES COMMISSION STATE OF CONNECTICUT DOCKET NO. 2,437.

In the matter of petition of the Connecticut Company for approval of proposed method and manner of construction of a transmission line from station "A" of said petitioner in the city of New Haven to Middletown Avenue in said city, and thence on private way and along and across highways in the town of North Haven.

On July 23, 1917, the following petition was presented:

STATE OF CONNECTICUT, OFFICE OF THE PUBLIC UTILITIES COMMISSION.

Upon the foregoing it is ordered that same be heard at the office of the commission in Hartford, Room No. 47, State Capitol, on Monday, July 30, 1917, at 11:30 o'clock in the forenoon and that notice of the time and place of said hearing be given to the petitioner, to the city of New Haven, to the town of North Haven and to the various pole line companies whose wires it is proposed to cross, by Henry F. Billings, secretary of this Commission, by forwarding by registered mail, true and attested copies of said petition and of this order of notice for hearing, addressed one to Victor S. Curtis, secretary the Connecticut Company, New Haven, Conn., one to the Mayor and Board of Aldermen of the city of New Haven, Conn., one to the Board of Selectmen of the town of North Haven, North Haven Conn., one to the Southern New England Telephone Company, New Haven, Conn., one to the United Illuminating Company, New Haven, Conn., one to George M. Yorke, vice-president Western Union Telegraph Company, No. 195 Broadway, New York, N. Y., one to S. L. Hays, general foreman Western Union Telegraph Company, New Haven, Conn., one to Postal Telegraph-Cable Company, Connecticut Mutual Building, Hartford, Conn., and one to Arthur E. Clark, secretary the New York, New Haven & Hartford Railroad, New Haven, Conn., on or before the twenty-fourth day of July, 1917, and due return make hereon.

Dated at Hartford, Conn., this twenty-third day of July, A. D., 1917.

PUBLIC UTILITIES COMMISSION,
By *Henry F. Billings*,
Secretary.

Hartford County, ss.

Hartford, July 24, 1917.

Then I deposited in the post office in Hartford, by registered mail, true and attested copies of the foregoing, addressed to the parties as directed in said order.

Attest:

Henry F. Billings,
Secretary.

Exhibit III—Finding of Commission on Petition for Approval

PUBLIC UTILITIES COMMISSION STATE OF CONNECTICUT, DOCKET NO. 2437.

In the matter of petition of the Connecticut Company for approval of proposed method and manner of construction of a transmission line from station A of said petitioner in the City of New Haven to Middletown Avenue in said city, and thence on private way and along and across highways in the town of North Haven.

On July 23, 1917, the following petition was presented.

(Here followed the petition in full.)

The foregoing petition was duly assigned for hearing at the office of the Commission on Monday, July 30, 1917, at 11:30 o'clock in the forenoon, at which time and place the parties appeared and were fully and finally heard. Several of the companies whose lines will be crossed by the proposed construction appeared at said hearing but offered no objection to the granting of said petition. Petitioners stated the general purposes of the proposed construction and the specifications under which it would be carried out. Blue print plans referred to in the petition were explained at said hearing. It was stated that in general the method of construction would follow the specifications approved by the United States Bureau of Standards as set forth in the National Electric Safety Code, so-called, issued November, 1916. It was stated that the normal length of span between poles would be 125 feet but that owing to topographical conditions and presence of structures of other companies, the span distance would be somewhat increased at certain points, but that in such cases the extra span length would be compensated for by additional strength of construction.

Upon consideration of all the facts shown at said hearing we are of opinion and find that approval should be and it hereby is given for the construction by the Connecticut Company of a transmission line from Station A, so-called, of said Connecticut Company in New Haven, on poles carrying the present Branford transmission line of said company, as far as Middletown Avenue, New Haven, and thence on private way and along and across certain highways to the substation of said Connecticut Company, in the town of North Haven, as shown on blue print plan on file in this office and made a part hereof, which plan is entitled: "The Connecticut Company, New Haven Lines, Office of Construction Engineer, New Haven, Conn. Proposed transmission line Station A New Haven to North Haven, Substation. Scale: 1/200.-000, July 21, 1917. Drawn by A. L. C. Traced by A. L. C. Approved Charles Rufus Harte, Construction Engineer." Said construction to be in accordance with specifications approved by the United States Bureau of Standards as set forth in the National Electric Safety Code, so-called, issued by said Bureau November 15, 1916, and as more particularly shown on blue print plans on file in this office and made a part hereof which plans, consisting of four blue print sheets showing pole top construction, one blue print sheet showing construction at angle points, and thirteen blue print sheets showing construction at crossings of highways and lines of other companies are sub-titled respectively as follows:

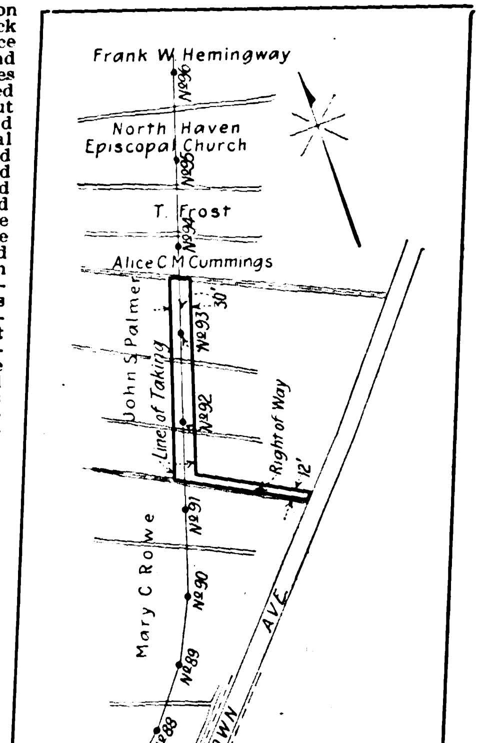
1. New Haven-North Haven transmission line; pole top construction on special crossing poles with 11,000 and 33,000 volt circuits.
2. Pole top construction on poles with 11,000 and 33,000-volt circuits, wood poles.
3. Normal pole top construction, wood poles.
4. Pole top construction on special crossing poles carrying 33,000-volt circuits.

1. New Haven-North Haven transmission line; construction at angle points.

1. Proposed transmission line, station A New Haven to North Haven substation, main highway crossing.
2. Crossing over Northford highway.
3. Old highway crossing, North Haven, Conn.
4. Crossings over main highway and Connecticut Company tracks.
5. Crossing over highway bridge near Muddy River.
6. Crossing over New York, New Haven & Hartford Railroad at Muddy River.
7. Crossing over Montowese Railroad Station.
8. Crossing over New York, New Haven & Hartford Railroad at Middletown Avenue.
9. Crossing over New York, New Haven & Hartford Railroad near Quinnipiac River.
10. Crossing over Ferry Street—Middletown Avenue.
11. Main Street and Peck and Blatchley Avenue crossings.
12. James and Humphrey Streets and Railroad crossings.
13. Grand Avenue crossing.

the normal length of span between poles to be not exceeding 125 ft. and whenever a longer span is found to be necessary the method of construction shall be such as to accord the same factor of safety as exists under the normal construction with 125 ft. span.

We hereby determine and direct that notice of the foregoing be given to the petitioner, to the city of New Haven, to the town of North Haven, and to the various pole line companies whose wires it is proposed to cross, by Henry F. Billings, secretary of this Commission, by forwarding by registered mail, true and attested copies hereof, addressed one to Victor S. Curtis, secretary, the Connecticut Company, New Haven, Conn., one to the Mayor and Board of Aldermen of the city of New Haven, New Haven, Conn., one to the Board of Selectmen of the town of North Haven, North Haven, Conn., one to the Southern New England Telephone Company, New Haven, Conn., one to the United Illuminating Company, New Haven, Conn., one to George M. Yorke, vice-president,



CONNECTICUT COMPANY'S PLAN, SHOWING LAND TO BE CONDEMNED AND TAKEN FROM JOHN S. PALMER. THIS PLAN IS PART OF EXHIBIT IV

Western Union Telegraph Company, 195 Broadway, New York City, one to S. L. Hays, general foreman, Western Union Telegraph Company, New Haven, Conn., one to Postal Telegraph-Cable Company, Connecticut Mutual Building, Hartford, Conn., and one to Arthur E. Clark, secretary, the New York, New Haven and Hartford Railroad Company, New Haven, Conn., on or before the Ninth day of August, 1917, and due return make hereon.

Dated at Hartford, Connecticut, this third day of August A. D., 1917.

RICHARD T. HIGGINS } PUBLIC UTILITIES
C. C. ELWELL } COMMISSION

Hartford County, ss.:

Hartford, Aug. 9, 1917.

I hereby certify that the foregoing is a true copy of the original order as on file and record in this office.

Attest:

By *Henry F. Billings*,
Secretary.

Exhibit IV—Vote of Directors to Condemn Land of John S. Palmer

At a regular meeting of the directors of The Connecticut Company held in the general offices of the company in the Second National Bank Building, 129 Church Street, New Haven, Conn., on Saturday, Nov. 3, 1917 at 10:45 a.m.

On motion, duly seconded, the following resolution was unanimously adopted:

"RESOLVED: That in connection with Authorization No. 2538 to build a transmission line between New Haven and North Haven, public necessity requires that the extension of the already existing transmission line be located upon and across land, the record title of which is in Harry V. Santry, of New Haven, Conn., but to which John S. Palmer, of said New Haven, claims to have an interest, said land being in the town of New Haven, county of New Haven and State of Connecticut, and bounded and described as follows:

"'Southeast by Middletown Avenue; Southwest by land formerly of Albert Goodyear, now of Mary C. Rowe; Northwest by the creek, and Northeast by land formerly of T. Foisie, now of Alice C. M. Cummings; containing four and one-half (4½) acres, more or less, being salt meadow. All as shown on attached plan, entitled: "The Connecticut Company, New Haven, lines, Office of Construction Engineer, New Haven, Conn. New Haven-North Haven Transmission Line. Location across John S. Palmer, Nov. 3, 1917,"' and

"RESOLVED: That the Connecticut Company locate said transmission line upon the land above described, and take all land needed therefor."

A true copy of record,
(Signed) *V. S. Curtis*,
Secretary.

Exhibit V—Finding of Commission on Petition to Fix Limits of Taking

PUBLIC UTILITIES COMMISSION, STATE OF CONNECTICUT, DOCKET NO. 2604.

In the matter of petition of the Connecticut company for reapproval of construction of a transmission line in the city of New Haven and town of North Haven, as appears on file under Dockets Nos. 2437 and 2437A, dated Aug. 3, 1917 and Sept. 13 1917, respectively.

On Nov. 15, 1917, the following petition was presented:

TO THE HONORABLE PUBLIC UTILITIES COMMISSION OF THE STATE OF CONNECTICUT.

The petition of the Connecticut Company respectfully represents:

1. That it is a company organized and existing under and by virtue of a charter granted by the General Assembly of the State of Connecticut, for the purpose of constructing and operating street railways, and having its principal office at New Haven in said State.

2. That on the eighteenth day of September, 1917, after public notice and hearing, your Honorable Commission approved plans for locating, constructing, and maintaining certain foundations, posts, poles, and wires and all appurtenances thereto necessary for the operation of the railway of the Connecticut Company by electricity, as more fully appears in Docket No. 2437 and Docket No. 2437A in the files of your Honorable Commission.

3. That the location of said foundations, posts, poles, wires and appurtenances, calls for the same to cross certain land in the city and county of New Haven, the record title of which stands in the name of one Harry V. Santry, as more definitely shown on blue print hereto attached, and entitled: "The Connecticut Company, New Haven Lines, Office of Construction Engineer, New Haven, Conn. New Haven to North Haven Transmission Line. Location across John S. Palmer. Scale 1" = 100'. Approved, Charles Rufus Harte, Construction Engineer."

4. That one John S. Palmer, residing on Quinnipiac Avenue, in the town of North Haven, Conn., also claims an interest in said land.

5. That said John S. Palmer refuses to grant permission to the Connecticut Company to erect its posts, poles, wires and other appurtenances across said land.

Wherefore, said the Connecticut Company prays your Honorable Body, after notice to said John S. Palmer, to re-approve said construction and to prescribe upon said land the limits within which real estate shall be taken for the purposes approved in Docket No. 2437A, and to give written approval to said the Connecticut Company of the location as limited by you.

Dated at New Haven, Conn., this fifteenth day of November, 1917.

THE CONNECTICUT COMPANY,
By *S. W. Baldwin*,
Its Attorney.

STATE OF CONNECTICUT, OFFICE OF THE PUBLIC UTILITIES COMMISSION.

Upon the foregoing it is ordered that same be heard at the office of the Commission in Hartford, Room No. 47, State Capitol, on Monday, Nov. 26, 1917, at 11:30 o'clock in the forenoon and that notice of the time and place of said hearing be given to the petitioner, to Harry V. Santry, in whose name stands the record of title of certain land proposed to be crossed, and to John S. Palmer, also claiming an interest in said land, by Henry F. Billings, secretary of this Commission, by forwarding by registered mail, true and attested copies of said petition and of this order of notice for hearing, addressed one to Victor S. Curtis, secretary, the Connecticut Company, New Haven, Conn., one to Harry V. Santry, 134 Grand Avenue, New Haven, Conn., and one to John S. Palmer, Quinnipiac Avenue, North Haven and City of New Haven, Conn., on or before the ninteenth day of November, 1917, and due return make hereon.

Dated at Hartford, Conn., this ninteenth day of November A. D., 1917.

PUBLIC UTILITIES COMMISSION,
By *Henry F. Billings*,
Secretary.

Hartford County, ss.

Hartford, Nov. 19, 1917.

Then I deposited in the post office in Hartford, by registered mail, true and attested copies of the foregoing, addressed to the parties as directed in said order.

Attest:

Henry F. Billings,
Secretary.

Exhibit VI—Petition to Superior Court to Appoint Appraisers

THE CONNECTICUT COMPANY
vs.
JOHN S. PALMER

Superior Court
New Haven County

In the matter of the application of the Connecticut company for the appointment of appraisers to estimate damages for the taking of real estate.

TO THE HONORABLE JAMES H. WEBB,
a Judge of the Superior Court:

The application of the Connecticut Company, a corporation organized and existing under and by virtue of a charter granted by the General Assembly of the State of Connecticut, for the purpose of constructing and operating street railways, and having its principal office at New Haven in said state, respectfully represents:

1. That your applicant on the third day of November, 1917, by a vote of its Board of Directors of that date, took for railway purposes the land described in said vote, for the construction, maintenance or operation of necessary and properly supported conductors of electricity for the transmission of electricity from New Haven upon its railway where said electricity is generated to North Haven, in said State, where said electricity is to be applied, as more fully appears in said vote which is attached hereto, marked "Exhibit 'A,'" and made a part hereof.

2. That on the twenty-seventh day of December, 1917, the Public Utilities Commission of the State of Connecticut, under its Docket No. 2604, approved the taking of said land and limited the location of said land to be taken, as more fully appears in copy of said Docket No. 2604, which is attached hereto, marked "Exhibit 'B,'" and made a part hereof.

3. The only party now claiming an interest in said land is John S. Palmer, who resides on Quinnipiac Avenue, in the Town of North Haven, County of New Haven, and State of Connecticut.

4. Your applicant is unable to obtain said land by agreement with said John S. Palmer.

Wherefore, your applicant applies to Your Honor to appoint appraisers, as provided by statute, to estimate all damages that may arise to any person from the taking and occupation of the above described real estate for railway purposes, and asks that Your Honor will further order that reasonable notice of this application be given to said John S. Palmer.

Dated at New Haven, Conn., this twenty-ninth day of December, A.D., 1917.

THE CONNECTICUT COMPANY,
By *S. W. Baldwin*,
Its Attorney.

Exhibit VII—Court Order for Hearing on Taking

THE CONNECTICUT COMPANY
vs.
JOHN S. PALMER

Superior Court
New Haven County

In the matter of the application of the Connecticut Company for the appointment of appraisers to estimate damages for the taking of real estate.

The foregoing application of the Connecticut Company praying for the appointment of appraisers to estimate all damages that may arise to John S. Palmer from the taking and occupation of real estate for railway purposes, as set forth in said application, having been presented to me, a Judge of the Superior Court, it is

ORDERED that the same be heard and determined before me at ten o'clock in the forenoon on the third day of January, A.D. 1918, at the Superior Court Room in New Haven, and that notice of the pendency of said application and of this order be given to said John S. Palmer, the party in interest, by some proper officer or indifferent person, by personally presenting to said John S. Palmer, or leaving at his place of residence, a true and attested copy of said application and of this order, and return make of his doings under this order.

Dated at New Haven, Conn., this thirty-first day of December, A.D., 1917.

(Signed) JAMES H. WEBB,
A Judge of the Superior Court.

Exhibit VIII—Court Approval of Choice of Appraisers

In the Matter of the Application
of THE CONNECTICUT COMPANY, a
corporation, of New Haven,
Connecticut.
vs.
JOHN S. PALMER,
of North Haven, Conn.

Before
HONORABLE JAMES H. WEBB,
A Judge of the Superior Court,
New Haven County,
Jan. 3, 1918.

JUDGMENT

In the matter of the application of the Connecticut Company in the above entitled cause, dated December 29, 1917, and returnable before me as a judge of the Superior Court on the third day of January, 1918, the parties, having been duly notified, appeared before me in the Superior Court Room in New Haven on said date and agreed upon.

Ernest Brockett, of North Haven, Conn.,
William A. Wright of New Haven, Conn.,
and
David B. Andrews, of North Haven, Conn., as the appraisers.

Wherefore, in accordance with the statutes in such cases made and provided, I appoint

Ernest Brockett,
William A. Wright,
and
David B. Andrews,

appraisers to estimate the damage, if any, which may arise to said John S. Palmer from the taking and occupation of the land in the manner and form as limited in Docket No. 2604 of the Public Utilities Commission of the State of Connecticut, as more fully appears in said Docket, a copy of which is to this petition attached.

HONORABLE JAMES H. WEBB,
A Judge of the Superior Court.

Exhibit IX—Appraisers' Return, Which Is Equivalent to a Judgment by the Court

In the Matter of the Application of
THE CONNECTICUT COMPANY,
a Railway Corporation, of
New Haven, Conn.
vs.
JOHN S. PALMER,
of North Haven, Conn.

Before
HONORABLE JAMES H. WEBB,
A Judge of the Superior Court,
New Haven County,
January, 1918.

RETURN OF APPRAISERS

To the Clerk of the Superior Court in and for the County of New Haven, Conn.

The undersigned, appointed Jan. 3, 1918, upon application of the Connecticut Company, by the Honorable James H. Webb, a Judge of the Superior Court, appraisers to estimate and assess all damages arising from the taking and occupation of certain lands, fully described in said application to John S. Palmer, the owner of said lands, respectfully report:

That they gave due notice to said John S. Palmer, and to the applicant, that they would meet for the purpose of their appointment on the ninteenth day of January, 1918, at the Superior Court House, in the City of New Haven, in said New Haven County, at ten o'clock in the forenoon, and on said day they met at the time and place named in their notice, and were duly sworn, and met said John S. Palmer and the applicant, who made appearance, and on said day they viewed the premises described in the application, and they fully heard said parties their witnesses and counsel, concerning the damages aforesaid.

That the lands taken and occupied by the applicant are contained in the land in the city and county of New Haven, State of Connecticut, and bounded and described as follows:

Southeast by Middletown Avenue; Southwest by land formerly of Albert Goodyear, now of Mary C. Rowe; Northwest by the Creek, and Northeast by land formerly of T. Forsie, now of Alice C. M. Cummings, containing four and one-half (4½) acres, more or less, being salt meadow, and the amount taken is limited as follows:

So much of said land as may be necessary for the erection and maintenance of a transmission line, together with the necessary supports, wires and fixtures, over, across and upon the land of said Palmer. the land necessary to be taken for this purpose not to exceed a total width of thirty feet (30 ft.), the same being fifteen feet (15 ft.) in width on either side of the center line of poles; and a right of way easement in said land twelve feet (12 ft.) in width and running in a westerly direction along the southerly boundary of said land, from said Middletown Avenue to that portion of the land hereinbefore referred to as necessary to be taken for the erection and maintenance of said transmission line, all as shown on plan attached to the petition herein and entitled: "The Connecticut Company, New Haven Lines. Office of Construction Engineer. New Haven, Conn. New Haven-North Haven Transmission Line. Location across John S. Palmer, Nov. 3, 1917."

That said John S. Palmer appeared and claimed damages arising from the taking and occupation of said land as above described.

Wherefore, the said appraisers, having viewed said land and fully considered the evidence of said parties and their witnesses, and the claims and arguments of counsel, do estimate all damages arising to said John S. Palmer from the taking and occupation by the applicant, for the purposes set forth in said application, at one hundred dollars ($100).

Dated at New Haven, Conn., this (?) day of January, 1918.

Ernest Brockett
William A. Wright } *Appraisers.*
David B. Andrews

Equipment and Design Features of Metropolitan District Cars

Improvements Over Cars of Older Design Include Use of 190-Hp. Tapped-Field Motors, Semi-Automatic Acceleration and More Compact Arrangement of Auxiliary Equipment

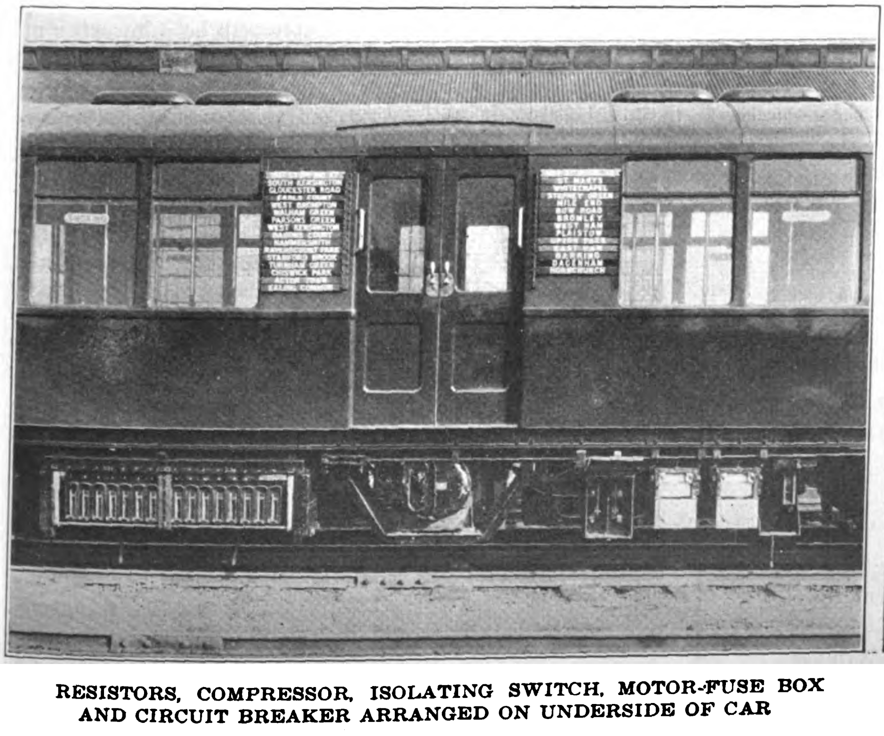
AN ARTICLE dealing with the new steel rolling stock received by the three railways operating London's rapid transit lines was printed in the March 5 issue of this paper. This dealt more particularly with their ability to permit rapid transfer of passengers as determined by the number and arrangement of doors. Also some attention was devoted to a general description, which included the layout of the seats, the replacement of straps with handrails and posts and interior fittings. Now more detailed information has been forthcoming relating to the general design and equipment features of the Metropolitan District Railway cars.

The first cars of the order, comprising 100, were put in service in February. During the first few days an eight-car train was stationed for a few hours at one of the busiest stations, with the view of letting the public familiarize itself with the improved rolling stock as a concrete example of how Lord Ashfield was overcoming congestion difficulties in the underground railways. The train aroused a great deal of public and newspaper interest and comment.

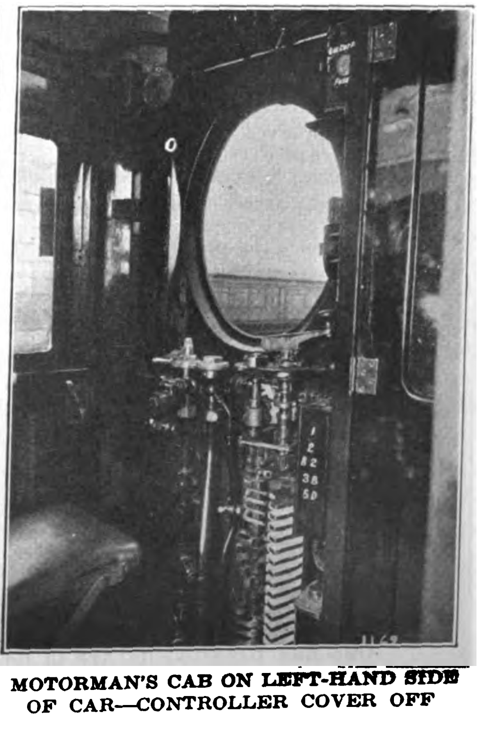
The cars are 49 ft. long and 9½ ft. wide. Their height is about 12 ft. The motor cars weigh about 50 tons each, the control trailers 29 tons and the trailer cars 27.5 tons. The wheel base of the motor trucks is 7 ft. 10 in.

Much thought has been put into the electrical design, for that equipment embodies and co-ordinates the most modern apparatus. The motor cars are each equipped with four G. E. 260 motors, which are of the interpole tapped-field self-ventilating type. They are rated at 190 hp. for one hour and 182 amperes continuously. The motors are fitted with twenty-tooth pinions geared to sixty-three-tooth gears. The wheels are 36 in. in diameter. Each pair of motors with its control gear constitutes a complete unit equipment. The normal rate of acceleration will be 1½ m.p.h.p.s.

Substantial improvements have been made in the control apparatus. The contactor tips are provided with arcing horns and a molded arc chute. The interlocks are of the disk type, mounted on the back of the contactor.



RESISTORS, COMPRESSOR, ISOLATING SWITCH, MOTOR-FUSE BOX AND CIRCUIT BREAKER ARRANGED ON UNDERSIDE OF CAR



MOTORMAN'S CAB ON LEFT-HAND SIDE OF CAR—CONTROLLER COVER OFF

The contactor box with all its contactors, resistances, etc., is a unit complete with wiring and has its own terminal base. The reverser connected to the motor fields is of the drum type operated by a pair of opposed solenoid coils. The control is non-automatic except that the motor field is weakened automatically by the tapped-field relay when the current decreases as the last parallel point on the controller is reached.

The cars are equipped with Westinghouse clasp brakes of the standard type and are provided with automatic slack adjusters. Hand brakes are fitted to all motor cars and control trailers.

The underframes are constructed entirely of steel, bulb angles form the sole bars and the center longitudinals are rolled steel channels running the whole length of the frame. The cross bearers at the trucks are pressed channel sections. The floor plates are stiffened with short angles and pressings across from the sole bars to the center longitudinals.

The motor car truck side frames are channel sections running the whole length of 13 ft. to the headstocks, but are cut away on the bottom flange to receive the axle boxes. The bolsters are built up of 8 x 3 in. channels 5½ in. apart and stiffened with 5/16-in. plates.

The former arrangement of carrying the draft gear back to the kingpin has been abandoned and a short drawbar fixed to the longitudinal members is substituted. Tight couplings between cars is the result of the use of a central spring buffer through which the drawbar head passes.

Rules for Track Foremen

Eastern Massachusetts Gives Nine Suggestions to Help Them in Their Work

F. B. WALKER, *engineer maintenance of way Eastern Massachusetts Street Railway, has got out the following nine suggestions for the track foreman on that system:*

THINGS TO DO IF YOU ARE TO MAKE A SUCCESS IN 1921 ON YOUR DIVISIONS

1. Keep all tools and equipment properly repaired.
   Blaming your tools is a POOR EXCUSE.
2. Make requisitions and properly record all material used.
   Taking material without requisition is THEFT.
3. Secure approved authority for all work not current maintenance.
   This railway has to have SOME SYSTEM.
4. Know that proper equipment and tools and efficient men are on every job.
   Lack of these shows POOR PLANNING.
5. Concentrate on more extensive and better repairs to rail joints.
   Poor joints make POOR TRACK and high maintenance COSTS.
6. Weld as many joints as possible with due regard to costs.
   Welded joints are a substantial ECONOMY.
7. Drain your track at all seasons—DIG, DITCH and DRAIN.
   Bad drainage is a CRIME. Its penalty is DEATH to track and motors.
8. Reciprocate in use of tools and cars with other divisions.
   Because you are a GENTLEMAN.
9. Team work means SUCCESS. Secure this by having all your men know, so far as is consistent, the costs, plans and reasons for doing our work.

One-Man Departments Are to Be Avoided

Chamber of Commerce Meeting

Paper on Arrested Development of Public Utilities Presented by Edward N. Hurley at One General Session at the Annual Meeting Held at Atlantic City

THE annual meeting of the United States Chamber of Commerce, held last week at Atlantic City, concluded on April 29. On the evening of April 28 Secretary Herbert Hoover of the Department of Commerce presented an address. At the final meeting President Defrees was re-elected president.

The only paper directly related to public utilities was on their arrested development and was presented by Edward N. Hurley, formerly chairman United States Shipping Board and now with the Hurley Machine Company, Chicago, Ill. An abstract follows:

Arrested Development of Public Utilities*

BY EDWARD N. HURLEY

Formerly Chairman United States Shipping Board

AMERICA today is at the crossroads of electrical development. It is a question whether we are to go forward or stand still. At this very moment the electrical industry is suffering from arrested development. The industry is awaiting the verdict of the American people. We like to think of ourselves here in America as the pioneers in the science of electricity. We have been the pioneers, but the job we started has not been half done. There are still fourteen million homes in the United States without electric service and which eventually will have it. It is authentically stated that if the present problem of housing the population is to be met, the United States needs 1,500,000 additional homes, 500,000 additional factories, 5,000 public schools, 5,000 churches, 60,000 apartment buildings and 15,000 theaters. These, too, mean electric service. There are 150,000 pending applications for power by existing or new industrial plants desirous of utilizing electricity.

PROPER ENCOURAGEMENT NEEDED

If the proper encouragement is given to the electric light and power industry, the industry will spring forward in the next decade faster even than in the past decade. The result unquestionably will be a lowering of the cost of living and the conservation of national resources which cannot fail to benefit the whole population. I think it will be agreed that upon the development and application of electrical energy, more than upon any other one thing, are dependent both the speeding up of production and the conservation of our natural resources.

The financial standing of a well managed street railway, gas or electric lighting plant is as vital to the life and development of a community as its banks, and should be protected against unfair attacks so that customers and the investing public will have confidence in the properties, resulting in a desire to purchase utility securities when offered. The American people must realize that confidence in public utility securities cannot be had by constant, unjust criticism. If the same kind of public attack should be made upon national and state banks in the same communities where members of state commissions and other public officials are now bitterly assailing the central stations and street railway companies, the public would lose confidence and in a very short period these banks would be forced to close their doors.

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*Abstract of address presented at the annual meeting of the Chamber of Commerce of the United States, Atlantic City, N. J., April 29, 1921.

FINANCING FROM EARNINGS IMPOSSIBLE

No public utility corporation subject to regulation can finance its requirements out of earnings.

For every dollar of additional annual gross revenue from the sale of electric energy by a light and power company it is necessary to provide additional facilities involving an investment of from $4 to $6. Thus a company with a gross revenue of, say, $1,000,000 per year, to provide for a growth of 10 per cent per annum ($100,000), which is a very moderate rate, would have to spend $400,000 to $600,000 for additional generating capacity and distribution facilities. With earnings limited by commission regulation to 8 per cent on the invested property value, which is below the actual cost of obtaining capital, it will be readily seen that additional capital must be secured if the facilities are to be provided to enable the growing service requirements of the community to be met, and such capital can be obtained only if assured a reasonable; permanent return.

Therefore, adequate facilities for the transportation, lighting and industrial requirements of a growing community can be made available only if the attitude of the public and of the commission authorities toward the electric enterprise is such as to encourage the necessary capital investment and to afford it the security as to principal and return without which the investor will refuse to become interested in the situation.

When financing, companies are compelled to make provisions for ample reservations, so that today public utility securities with substantial reserves are gilt-edged.

We must use scales to weigh our local utility problems, and withhold public criticism until the real facts are thoroughly known. For instance, one particular case of snap judgment happened in connection with the National War Labor Board during the war. The employees of the street railway in a town of about 250,000 demanded an increased wage. The War Labor Board granted the increase without giving the management a chance to present its side of the case. The matter was later reviewed after the wages had been put in force. It was then found that the street railway company could not meet the increase awarded and the interest on its bonds. It was suggested that the company increase the rate of fare, but it developed that if the rate of fare was increased to meet this over-night increase in wages, the reduction in the number of passengers carried—in the number of people who would stop riding rather than pay this increased fare—would make it impossible for the company to meet its fixed charges. This hurried decision, in fact, placed the street railway corporation in such an embarrassing position that a readjustment of wages and conditions was necessary in order to permit the street railway to survive.

GOVERNMENT OWNERSHIP OR PRIVATE OWNERSHIP

Although at one time sympathetic toward government ownership, I am certain, after a number of years in government service, that no community can receive the industrial service to which it is entitled under municipal or governmental management. The cause for this fact lies in the human element. No city, state or national industrial enterprise can expect to obtain from management, or from men, an average of more than 50 per cent of personal efficiency, or more than 50 per cent of personal interest in their work, and it must be remembered that this percentage will gradually decrease the longer the individual manager or the individual employee is in this industrial government service.

I say again that it is not humanly possible to obtain the same effort or interest from managers or men employed in industrial government service that exists in competitive private ownership, and that as a result, if the advocates of government ownership investigate the facts carefully and impartially, they will find that government operation in industrial service is a flat failure from a "service to the public" standpoint. This is true not only in America but it is a proved fact throughout the world.

If the members of the Chamber of Commerce of the United States of America, with their great power and influence, were to take a keen personal interest in public utilities in their respective states, insisting that justice be given the public and the utilities, a permanent step toward solving this most important problem would be taken.

Swiss Comment on American Electric Locomotives

IN A RECENT issue of *Schweizerische Bauzeitung*, A. Laternser, an engineer of Zurich, Switzerland, compares the qualities of a number of electric locomotives. These, with the conventional designations used abroad,* were as follows: General Electric freight locomotive for Milwaukee Railway (2B + B + B +B2) direct current; General Electric express passenger locomotive for Milwaukee Railway (1B + D + D + B1), direct current; Westinghouse freight locomotive for Pennsylvania Railroad (1C + C1), alternating current; Westinghouse express passenger locomotive for Milwaukee Railway (2C1 + 1C2), direct current; Oerlikon freight locomotive for Swiss Federal Railway (1C + C1), alternating current; Oerlikon express passenger locomotive for Italian State Railways (2C2), three-phase.

Comparing the geared and gearless types, Mr. Laternser disapproves of the latter on account of the low center of gravity and the former on account of the decreasing gear efficiency with increase in speed. He also objects to the large unsprung load in all three types of Milwaukee locomotives mentioned, stating that this produces excessive wear of rails, and calls attention to the fact that the two leading American firms building electric locomotives are not agreed as to the best construction for express passenger and freight types of heavy locomotives. It seems strange to him that both the General Electric Company and the Westinghouse company have had such excellent results with their respective types of construction. He considers the American designs for regeneration to be complicated and not fully reliable, and the whole design of electrical equipment of American locomotives to be more complicated than that of the Swiss Federal type. The two Oerlikon locomotives mentioned are the most powerful yet built for use abroad and are both equipped for regenerative braking.

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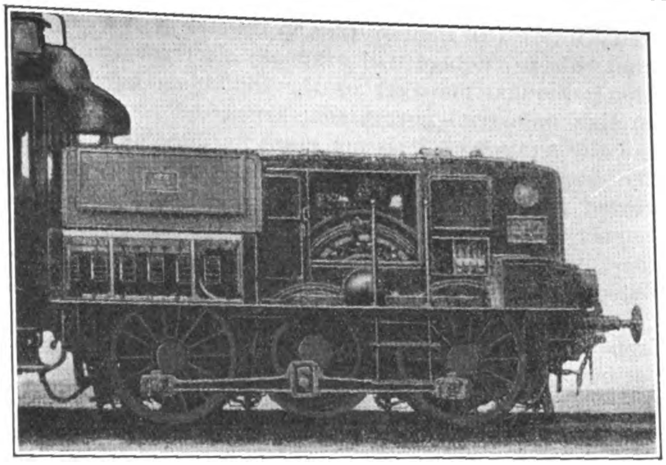
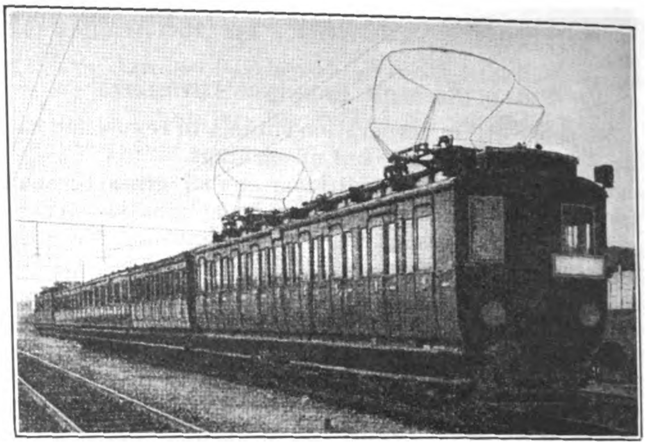
*The wheel arrangement of locomotives is designated thus: Beginning at the front end of the locomotive the number of pony axles is designated by a number, then the number of driving axles on the successive trucks by letters, A representing one driving axle, B two axles, C three axles, etc., a final number being used to indicate the number of pony axles at the rear. If there are any intermediate pony axles their number and position are indicated by numbers properly placed in the symbol.



EXPERIMENTAL ELECTRIC TRACTOR FOR USE ON BERLIN RAPID TRANSIT LINES



EXPERIMENTAL MULTIPLE UNIT TRAINS IN OPERATION IN BERLIN DURING PAST FEW MONTHS

Novel Electric Train Drive in Berlin

Experiments Indicate Superiority of Multiple-Unit Over Locomotive Operation in This Service—Ingenious Application of Electric Tractor Principle Suggests Early Days in This Country

IN THE article by E. C. Zehme appearing in the issue of the ELECTRIC RAILWAY JOURNAL for March 5, 1921, page 438, mention was made of some experiments in Berlin with rapid-transit trains. In a recent issue of the *Zeitschrift des Vereines deutsches Ingenieure* considerable detail is given of the experimental multiple-unit train which is in use, and also of the small electric tractors.

Referring first to the tractor, which is of noticeably low construction (being less than 5 ft. high), it is of interest to note that a complete suburban train, consisting of twelve coaches, has been propelled by two of these tractors, one each front and rear, controlled from the front platform of the first coach. The tractor draws current from a pantagraph mounted on the roof of the first coach.

The tractors contain each a single-phase commutator motor of 600 hp., hourly rating, or 580 hp., continuous rating, with forced air cooling. This drives a jackshaft through a reduction gear with a ratio of 1 to 3.54, and the jackshaft is in turn rod-coupled to the two driving axles. The framework of the tractor is made up largely of cast steel, the lower part of the motor being part of the casting.

Directly above one of the axles is mounted the main transformer, of 650-kva. hourly rating. It is of the air blast type. About one-sixth of the transformer output is required for train heating. A 15-kw. fan provides forced circulation for transformer and motor. On the other side of the motor, and above the second axle, is located an air compressor for operation of brakes, oil switch, pantagraph and rail sanders. Nine taps on the low-voltage winding of the transformer, two choke coils and two small resistors provide for twelve positions of the controller.

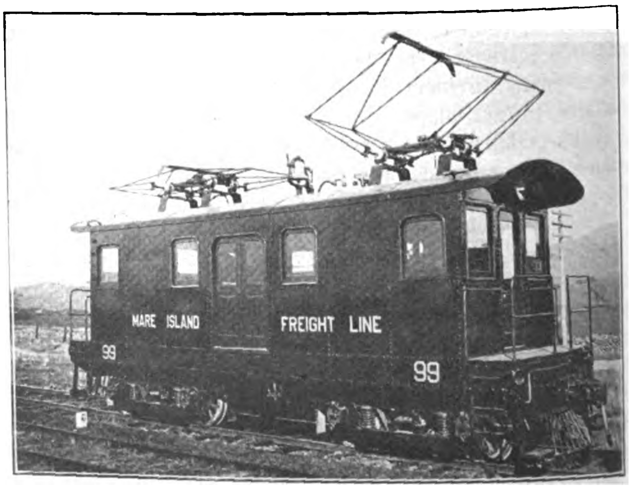
The wheelbase of the tractor is 9½ ft., the wheel diameter 4 ft. 5 in., the complete weight about 75,000 lb., the "unsprung" load 11,500 lb., the maximum speed 40½ m.p.h., the maximum speed of the motor 900 r.p.m., and the drawbar pull at the start 21,200 lb.

The tractor or locomotive plan for operating rapid transit trains in Berlin is, of course, highly experimental. It is doubtful if the rate of acceleration which can be produced with this arrangement is sufficient for local conditions. Another experiment which has been tried within the past few months is the use of motor cars and trailers, each motor car having an hourly rating of about 350 hp. and weighing completely equipped about 68 tons. The experimental train which has been in successful operation during the past winter consists of two motor cars and three trailers.

A Small Single-Phase Locomotive for Use at Mare Island

THE San Francisco, Napa & Calistoga Railway has just completed in its shops at Napa a 50-ton single-phase locomotive. It is to be used to handle government freight between the company's connection at Napa Junction with the Southern Pacific Company and the government's delivery yards at the Mare Island Navy Yard. Mare Island was recently connected with the main land by a causeway built by the government and electrified by the railway.

This locomotive, which was built especially for this service, has an over-all length of 35 ft. and a width of 9 ft. 6 in. The cab itself is 26 ft. long and at each end is a 30-in. platform. It is equipped with four Westinghouse 132-A motors mounted on heavy Baldwin trucks. Westinghouse AMM brake equipment is installed. The motors are geared with a ratio of 16 to 67 to the 34-in. steel-tired wheels. The locomotive takes its power from the 3,300-volt, 25-cycle line through a sliding pantagraph trolley. A 250-kw. transformer fed through an auto-



THE 50-TON SINGLE-PHASE LOCOMOTIVE USED ON THE MARE ISLAND CAUSEWAY matic oil circuit breaker provides suitable secondary voltage through the usual combination of switch groups and preventive coils.

The steel underframe for this locomotive is made in one piece. This single casting, weighing 7 tons, has 13-in. center sills and 10-in. side sills. Buffer plates of ¾-in. boiler iron were riveted around the ends, dropping low enough in the center to carry the pilot and extending around the sides a distance of 30 in. beneath the ends of the cab. Standard A.R.E.A. engine pocket couplers with 3-in. pins are attached through these plates to the steel end sill which forms a part of the underframe casting. The floor space provided for the equipment is 4 ft. x 18 ft. A structure of 3-in. x 3-in. angles with eight posts and suitable screens forms a cage for the inclosure of all apparatus.

Ammeters are placed in the engineer's cab and an Economy wattmeter is provided on the high tension side of the transformer for metering the total energy consumed.

The locomotive is owned jointly by the San Francisco, Napa & Calistoga Railway and the Sacramento Northern Railway.

George A. Hearn, superintendent of equipment, was the designing and construction engineer.

W., B. & A. Has New Terminal in Washington

AS ANNOUNCED in the news columns of this paper for March 19, 1921, the Washington, Baltimore & Annapolis Electric Railroad has begun the use of its new terminal in Washington, D. C. The terminal is located but three blocks from the Treasury Building. The railway purchased approximately one-half of the city block bounded by New York Avenue, Twelfth, Thirteenth and Eighteenth Streets, N. W., laid three new 200-ft. tracks into this yard and constructed new loading platforms. Buildings which were previously on the site have been utilized for waiting room, ticket office and news-stand and also with numerous offices on the upper floors.

FAST ELECTRIC TRAINS
BALTIMORE ANNAPOLIS CAMP MEADE
U.S. NAVAL ACADEMY CHESAPEAKE BAY
WASHINGTON BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD

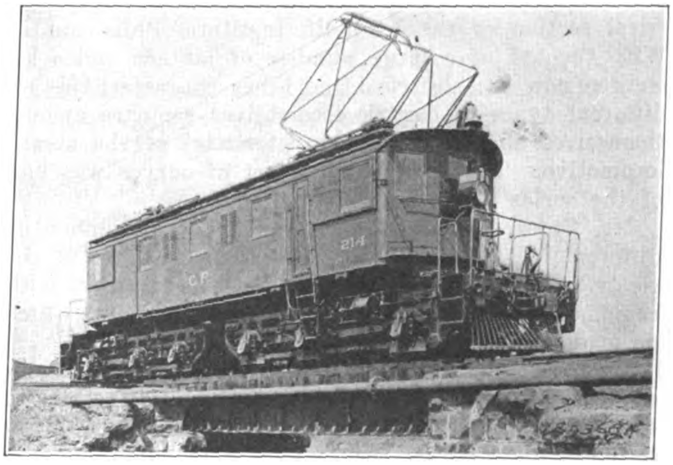
© Harris & Ewing, Washington, D. C.

TAKE ELECTRIC TRAIN HERE FOR BALTIMORE

Previous to the construction of this terminal the cars came up only as far as Fifteenth Street on New York Avenue, and loading was done from the street at these locations. The crowds waiting for cars in the streets led to such an interruption of traffic that protests were constantly being made and there were also general objections on the part of the public to the practice of loading these large interurban cars from the street. The new special trackwork was furnished by the Lorain Steel Company.

Paulista Locomotive Ready for Delivery

THE first Baldwin-Westinghouse freight locomotive for the Paulista (Brazil) Railway has been completed and tested. The passenger locomotives are nearing completion. The initial service on the double-track line between Jundiahy and Campiñas, a route-mileage of 28, will be furnished with eight freight locomotives and four passenger machines. Orders for two of each type were obtained by the Westinghouse Electric & Manufacturing Company. The remaining eight locomotives are being built by the General Electric Company.



BALDWIN-WESTINGHOUSE 3,000-VOLT DIRECT-CURRENT FREIGHT LOCOMOTIVE FOR PAULISTA RAILWAY

This electrification marks a milestone in the broad application of the natural resources of Brazil through the replacement of imported coal for power development. These locomotives are to be used in main-line freight service on the Paulista Railway, which is the main broad-gage trunk line of the most prosperous and productive part of the State of São Paulo.

This type locomotive weighs 105 metric tons (231,000 lb.) and has six driving axles each equipped with one 280-hp. direct-current motor. The motors are arranged for operation with two in series on the 3,000-volt line. Each locomotive is designed to handle trailing loads up to 770 tons over a line having a maximum grade of approximately 2 per cent. It is equipped with M.C.B. couplers for testing purposes, which will later be replaced with Continental draft gear. Also vacuum train brakes will replace the temporary pressure brake.

Enormous quantities of coffee, beans, rice, cereals and cattle are transported over this line by thoroughly modern and efficient railroading methods. Electrification is the latest step in the growth and progress of this notable railway, which is one of the most important lines in all South America.

The Denver & Interurban Railroad, Denver, Col., is planning to span South Boulder Canyon at Eldorado Springs with a suspension foot bridge. This canyon is one of the most picturesque chasms of Colorado and the new bridge will afford a wonderful view of the mountain scenery. The cliffs rise above the water of South Boulder Creek more than 1,000 ft. on the north side. On the south side of the canyon Castle Rock Cliff is a precipice of only 650 ft., so the bridge will be suspended in the air about 600 ft. because of the topography of the cleft forming the gateway. The company expects to go ahead with the proposition as soon as financial conditions will permit.

Electric Locomotive Characteristics

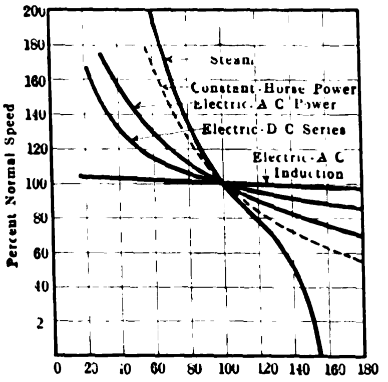
Engineer of Manufacturing Company Discusses Qualities of the Several Types of Locomotive Available and Outlines the Well-Known Advantages of Electric Motive Power

ON APRIL 14 N. W. Storer, of the general engineering department of the Westinghouse Electric & Manufacturing Company, read a paper before the electrical section of the Franklin Institute, Philadelphia. With the aid of a large number of lantern slides he showed how the electrical and other characteristics of different types of electric locomotives compare among themselves and with the characteristics of the steam locomotive. The accompanying set of curves was one of the series which he showed.

Mr. Storer discussed his topic under a number of different heads, listing thus the salient features of the electric locomotive and accompanying the summary with comments and illustrations. The principal points which he made were briefly as follows:

With the electric locomotive the power that can be applied to a train is in no way limited by the size of the individual motive-power unit. Theoretically the locomotive can draw the maximum amount of power that can be utilized at one point in the train.

With the electric locomotive the length of the operating division of a railroad is no longer limited by the locomotive. A record for a continuous twenty-four-hour run of 766 miles has been reached by passenger locomotives on the Chicago, Milwaukee & St. Paul. Electrification permits radical changes in terminals, due partly to the absence of smoke, dirt and noise and very greatly to the application of multiple-unit car equipment for the suburban traffic. The advantages in the use of the electric locomotive for long tunnels is obvious.



CURVE SHOWING SPEED-TRACTIVE EFFORT CHARACTERISTICS FOR STEAM AND ELECTRIC LOCOMOTIVES

Electrification involves conservation in fuel.

Due to the greater capacity which can be secured from the locomotive unit, electrification results in greater effectiveness of labor.

Increased reliability of motive power is also an important feature of electrification.

The characteristics of the electric locomotive that make it so desirable may be summarized thus: Its maximum tractive effort is from two to four times its normal continuous running tractive effort. Due to the fact that the capacity of the electric locomotive is limited by the heating of the motors, it can easily develop considerably more power in cold weather than warm. Practically all of the wearing parts of the electric locomotive have normally a long life.

Mr. Storer then discussed the characteristics of the several types of electric locomotives. He said that the characteristics of the direct-current locomotive are especially suited for railway service, since the speed curve falls rapidly as the tractive effort increases. The alternating-current locomotive does not have the ability to produce the high starting torques which are possible with the direct-current locomotive, but on the other hand the speed control is more easily and efficiently obtained by voltage variation. The induction-motor locomotive utilizes the constant speed characteristics of the induction motor. This motor is capable of producing very heavy starting torques and of carrying heavy load, but on heavy loads the speed is maintained at practically constant value and the power required increases practically in proportion to the tractive effort. It is necessary, therefore, to have a motor of greater capacity than with the series motor to take care of peak load. Regenerative braking may be obtained with any of the three classes of locomotives. It should be applied on locomotives which are to be operated over heavy grades, but for level or light grade sections the advantage will hardly be worth the complication.

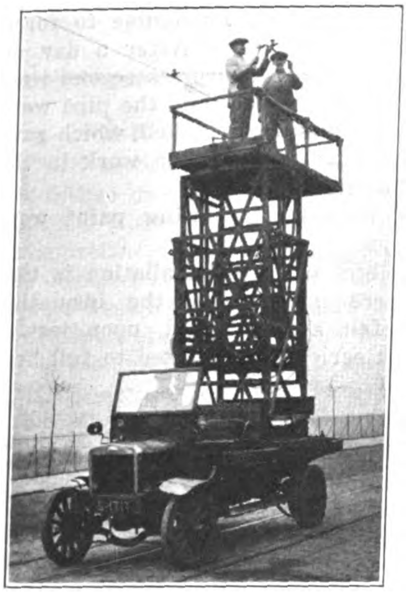
Wheel Welding in Terre Haute

FOR two and one-half years M. M. Nash, superintendent of railways and master mechanic of the Terre Haute Division, Terre Haute, Indianapolis & Eastern Traction Company, has been making extensive use of the resistance type of electric welder in reclaiming all manner of car equipment, including interurban car wheels and axles. During this period 2,500,000 interurban car-miles have been operated on the division and only one set of eight wheels has been replaced for flange wear. On all other wheels thin flanges and wheels otherwise worn have been built up and corrected by welding without removing them from the car. Not only have flanges been welded but they have been rewelded, and some of them have mileage records approaching 200,000 miles. These wheels are put out on the road in fairly fast interurban service just as the welders leave them, without any smoothing up, as the company has no wheel lathe in the Terre Haute shop. In exceptional cases a wheel-truing brakeshoe is used for a short time. Mr. Nash says the wheels are sometimes a little noisy when they are first put out on the road, but the rough surface soon smoothes out and he claims he has never had a derailment or flange breakage, more than a small chip, as the result of the welding work. "Railox" electrodes are used for welding the wheel flanges. Where a chip breaks out of the flange it is filled in again, but the projection of the new metal is not smoothed off. This takes care of itself.

A further step recently devised to prolong the life of a pair of wheels, in the absence of a lathe, is the burning off with an acetylene torch of the second flange which sometimes develops on the tread of a wheel. After this burning process is completed no attempt is made to smooth up the tread. The tread and flange are merely permitted to wear smooth in service.

The new Materials Handling Division of the American Society of Mechanical Engineers is planning sessions for the discussion of design and construction of machinery for road building, at the society's spring meeting, to be held at the Congress Hotel, Chicago, May 23 to 26. Four papers will treat this problem from the viewpoint of the contractor, the road builder, and possible future development of mechanical equipment in road building. The work of this division, whose membership is rapidly approaching one thousand, is now well under way.

Removable Tower Used for Making Overhead Repairs

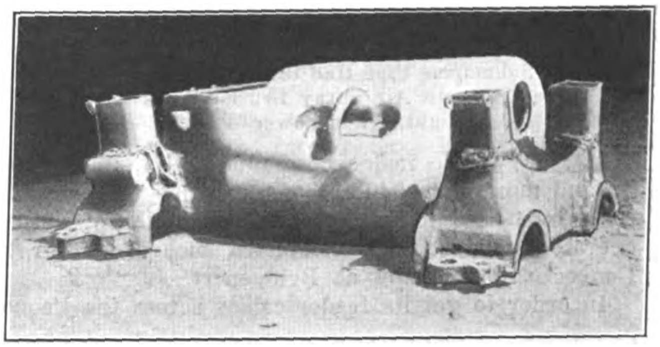

REMOVABLE TOWER IN USE.

THE accompanying illustration shows a removable tower used by the Edinburgh Corporation Tramways which is bolted to a lorry for use in making overhead repairs and which is readily lifted off when not needed. This leaves the lorry free for other work. This type of tower has also been found very convenient as an aid in the erection of some new overhead runway in the machine shop extension of this road. The tower was bolted to a low truck to facilitate its being moved about and the overhead railing was removed to provide necessary clearance.

One Way to Enlarge Oil Boxes

THE disadvantage of the small oil box on the frames of old motors such as the GE.-57 has, of course, been recognized for a long time and many ways of enlarging these have been tried.

The Little Rock (Ark.) Railway & Electric Company has some of these motors and has found a novel and satisfactory way of enlarging the oil boxes. Sections of old boiler tubes 4 or 5 in. long, 3½ in. in diameter, are first squared up and made to fit the opening of the box on the motor frame. The section of pipe is then welded to the motor frame, thus adding considerable capacity to the oil box. A cover, retained with a spring, is then put on top of the section of pipe. This work was started with the use of the two Indianapolis welders which the company has for doing trackwork. Recently a Wilson motor-generator set was added. This is now used for most of the work in the shop and also for bonding, and the Indianapolis welders are being used for trackwork. In an accompanying illustration is shown a GE-57 motor frame with the enlarged oil box.

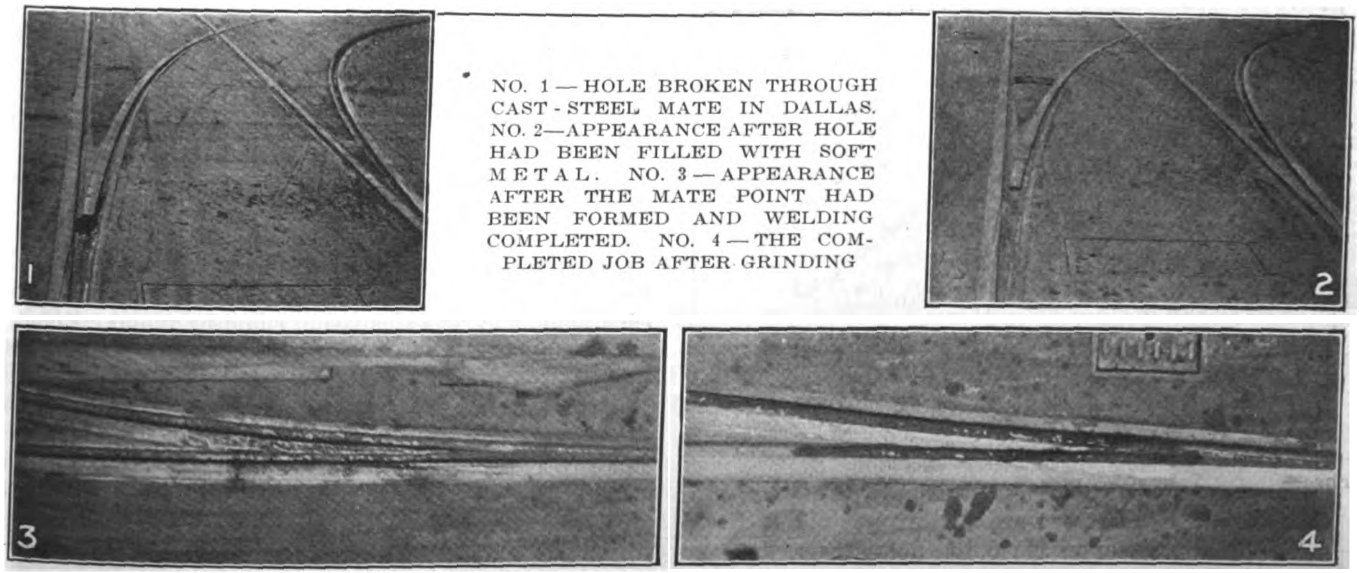

GE-57 MOTOR FRAME WITH SQUARED SECTIONS OF 3½-IN. PIPE WELDED TO ENLARGE OIL BOXES

Reclaiming a Cast-Steel Mate

FOUR accompanying pictures illustrate the success which is being obtained in the track department of the Dallas Railway under the direction of B. R. Brown, engineer maintenance of way and overhead construction, in reclaiming bad special trackwork. The particular job pictured shows a cast-steel mate in which a hole was broken down through the casting. The hole was filled up with slugs of iron and soft metal was fused into a solid mass to support the surface welding.

The mate was then built up by means of a hard steel electrode known as the A-steel of the Indianapolis Switch & Frog Company. The plane surface was properly finished by means of a reciprocating grinder and an Atlas rotary grinder was used for shaping up the point and flangeways. This job was done in forty hours by a welder and helper. After being in service for a period of six months the mate showed no signs of deterioration.

Very good success has also been had in welding solid manganese railroad crossings when in extremely bad condition. Mr. Brown says that the secret of this work lies in the mechanic who does the job and that it is simply a matter of knowledge as to how best to handle the metal.



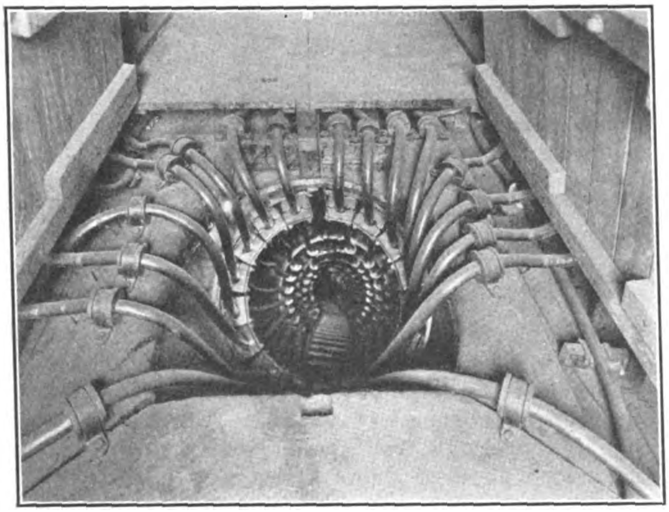
NO. 1—HOLE BROKEN THROUGH CAST-STEEL MATE IN DALLAS. NO. 2—APPEARANCE AFTER HOLE HAD BEEN FILLED WITH SOFT METAL. NO. 3—APPEARANCE AFTER THE MATE POINT HAD BEEN FORMED AND WELDING COMPLETED. NO. 4—THE COMPLETED JOB AFTER GRINDING

Painting Under Difficulties

Inside of Submarine Pipe Had to Be Painted by Workers in Pipe Using an Air Spray Brush—Work Done at Night, When Power Was Off

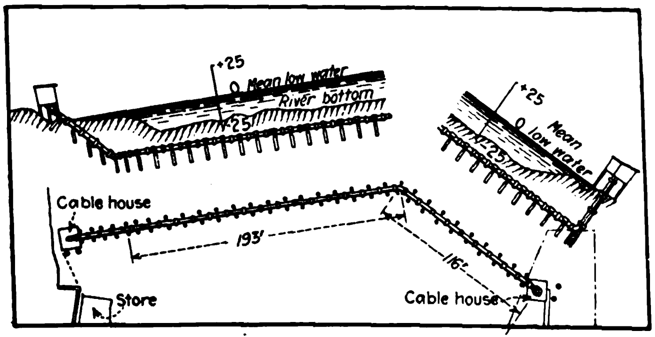
PAINTING the inside of a pipe 36 in. in diameter and more than 340 ft. long is a job to be avoided rather than sought, is the probable opinion of the two operators who recently completed such a job for the Connecticut Company at Bridgeport.

In order to get its feeder cables across the Pequonnock River at Bridgeport the Connecticut Company in 1906 laid down this 36-in. pipe, as shown in an accompanying illustration. At that time nine 750,000-circ.-mil lead-covered cables were installed, just laying them in the pipe. In 1913 eight 1,000,000-circ.mil cables were added, and at that time, in order to arrange the cables more satisfactorily in the pipe, they were placed on insulating brackets, as shown in another accompanying illustration. The third illustration shows a view looking down into the top of the 45-deg. section of pipe on the west side of the river.



LOOKING DOWN INTO WEST END OF PIPE, SHOWING CABLES MOUNTED ON INSULATORS

It was found a few months ago that the inside of the pipe was corroding badly and it was decided to paint it. On account of the fact that it was desired to have the cables remain insulated from the pipe itself it was necessary to use an insulating paint.



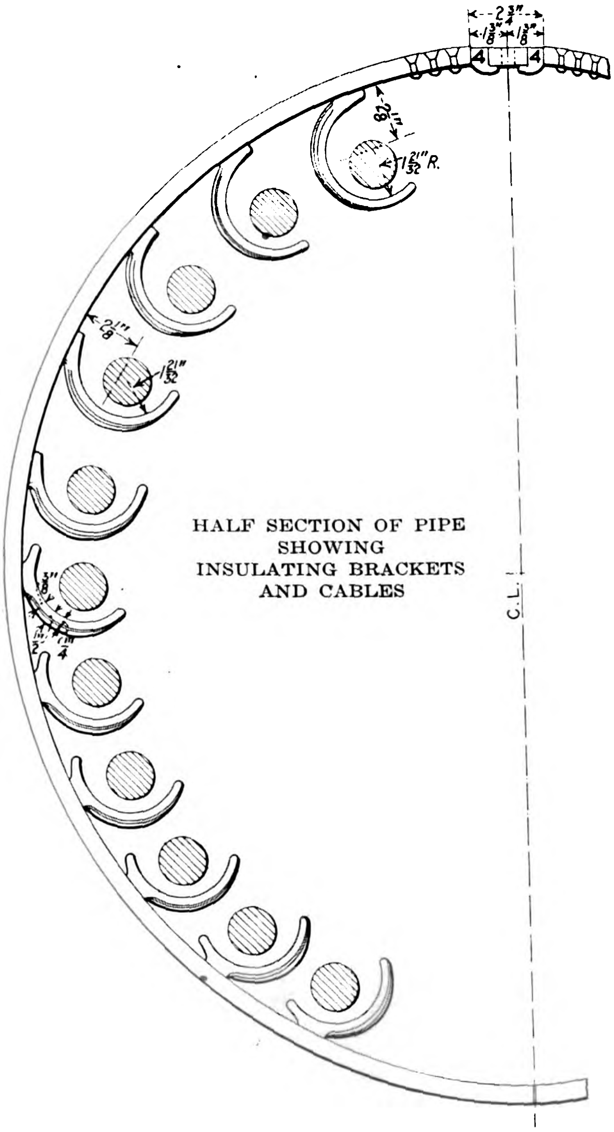
SKETCH OF FEEDER CABLE PIPE INSTALLATION, SHOWING RELATION TO RIVER

The paint was thinned with gasoline and applied with an air spray brush. The work was done by two men, working four hours at a time at night, when the power was off; they progressed about 45 ft. per night.

When the men approached the point where the vertical section of pipe meets that section which goes directly under the river, which is the lowest point on the whole system, the men were overcome by the gasoline fumes, it having been found impossible to force air through the pipe satisfactorily. After a day or two of rest, they tried it again and were a second time overcome. Strenuous efforts to ventilate the pipe were made, and finally a suction fan was installed, which gave sufficient circulation to allow the men to work in the pipe satisfactorily and finish the job.

About 120 gal. of Sterling insulating paint were used to complete the job.

An interesting sidelight on this installation is that after these cables were installed on the insulating brackets a workman felt a shock, and, upon test, a string of five lamps in series were lighted to full briliancy between the cable sheath and ground. All such tests were made for a period of a minute or more, each time, and no explanation could be found. Finally, one string of lights was left on for several minutes, and it was noted that after about two minutes the lights went out. This was found always to be the case, as the test was applied to other cables, and it was finally decided that there was enough static charge in the cable sheath to maintain this current for that length of time. Accordingly, all cable sheaths were grounded, through 2-amp. fuses, and no trouble has been noted.



HALF SECTION OF PIPE SHOWING INSULATING BRACKETS AND CABLES

Association News

National Electric Railway Day

THE association's advertising section for the committee on publicity reports that the success of the National Electric Railway Day idea far exceeded their anticipations. Much publicity for the industry attended the demonstrations both in the papers and by the film service weeklies. Where there were no demonstrations local papers gave considerable space to stories pertaining to the development of the local traction company.

Of the demonstrations marking the day that of Richmond, Va., the home of the electric railway, is probably the most striking. After several weeks' search the body of one of the cars used on the original electrified line was unearthed, fitted with new trucks and, with the Mayor and other city officials as escorts, was paraded over the streets used by the original route.

Other demonstrations of importance were held in Minneapolis and St. Paul. Here horse car No. 1, which was first put in service in St. Paul on July 17, 1872, was driven through the business section of both cities by the employees who formerly used the car in their daily runs. A score or more persons who also used the car when it was in service again rode as passengers. The trainmen's band led the demonstration, which also showed the growth of the cars used on that system.

Many of the various news film service companies as well as national still life photographers were busy in each of these places obtaining pictures for showing all over the country in the topical news weeklies.

In New Bedford there was also a unique demonstration. The company got out one of the old horse cars and in order to arouse enthusiasm on the part of the public offered a year's free transportation to the oldest person riding on the car. It is understood that there were more than a dozen competitors, the oldest one of whom was 82. The Boston papers gave considerable space to the event.

The papers also took hold of the news features and in many cities a considerable amount of space was given over to the history and development of the local traction company. A particularly good story concerning Reading, Pa., was printed in the local papers. The Eastern Pennsylvania Railways made wide use of the folders and other publicity sent out by the association.

The association's department of publicity has asked the various railways to send clippings and photographs showing what was actually done in their community not merely as a matter of record but for use in helping others to put over similar ideas at a later day.

Car Design Committee at Work

APPOINTMENT by President Gove of the committee of the American Electric Railway Engineering Association authorized at the last convention for the purpose of developing "anticipatory standards" of car design has been made. Under the direction of the chairman, H. H. Adams, superintendent of equipment Chicago Surface Lines, the work of this committee is already well under way. The rest of the personnel of the committee is equally divided between representatives of the car builders and railway companies, as follows: H. A. Benedict, mechanical engineer Public Service Railway, Newark, N. J.; J. A. Brooks, chief draftsman the J. G. Brill Company, Philadelphia, Pa.; J. W. Hulme, superintendent of equipment International Railways, Buffalo, N. Y.; G. L. Kippenberger, assistant to vice-president St. Louis Car Company, St. Louis, Mo.; John Lindall, superintendent rolling stock and shops Boston Elevated Railway; V. R. Willoughby, assistant general mechanical engineer American Car & Foundry Company, New York.

In a recent interview, Mr. Adams summed up the objects of the committee as being "to develop uniformity of car design out of the chaotic conditions existing at present, and ultimately leading up to the question of standardization." The committee has started out on its work by proceeding to gather information and data covering present practices in car design, limiting itself at first to a study of double-truck closed city car construction. To this end, Mr. Adams prepared a questionnaire which was sent to the members of the committee only, and which will bring back data to the chairman from which a comprehensive compilation of car dimensions can be made and analyzed and summarized. Through the very generous co-operation of the car builders represented on the committee, it will be possible readily to secure accurate data on a wide range of car designs built during the last five years, without having to call upon the railway companies.

After these data are compiled, Mr. Adams plans to call the committee together to make a study of the situation and endeavor to arrive at certain uniform dimensions to be embodied in car design, such as post centers, height and widths of body, side and roof dimensioning and construction, window sizes, seat dimensions and numerous elemental parts. Mr. Adams is of the opinion that it should be readily possible to bring about such uniformity in these details of design that cars of varying lengths can be made by simply adding or subtracting standard sections. Whether a car is of the double-end, center-entrance or Peter Witt type does not enter into the consideration, for each of these types could be built with a large part of the car body made up of the uniform sections.

C. E. R. A. Committees Announced

PRESIDENT A. C. Blinn of the Central Electric Railway Association has announced the following committee appointments for the current year:

Auditing.—Walter Shroyer, chairman, Anderson, Ind.; L. T. Hixon, Indianapolis, Ind.; E. O. Reed, Lima, Ohio.

Annual Transportation.—Bert Weedon, chairman, Indianapolis, Ind.; C. J. Laney, Akron, Ohio; J. F. Starkey, Sandusky, Ohio; W. S. Rodger, Detroit, Mich.; C. O. Sullivan, Lima, Ohio.

Constitution and By-Laws.—Arthur W. Brady, chairman, Anderson, Ind.; Charles L. Henry, Indianapolis, Ind.; F. W. Coen, Sandusky, Ohio; Frank R. Coates, Toledo, Ohio; E. F. Schneider, Cleveland, Ohio.

Finance.—James P. Barnes, chairman; Louisville, Ky.; T. A. Ferneding, Dayton, Ohio; F. R. Coates, Toledo, Ohio; F. W. Coen, Sandusky, Ohio.

Hotel and Arrangements.—S. D. Hutchins, Westinghouse Traction Brake Co., chairman; Harry L. Brown, ELECTRIC RAILWAY JOURNAL; John Benham, International Register Co.; L. E. Gould, Economy Electric Devices Co.; C. Dorticus, General Electric Co.

National Safety Council.—Harry A. Nicholl, chairman, Anderson, Ind.; J. W. Giltner, Akron, Ohio; R. A. Crume, Dayton, Ohio; A. Swartz, Toledo, Ohio.

Publicity.—Harry L. Brown, ELECTRIC RAILWAY JOURNAL, chairman; H. J. Kenfield, *Electric Traction*; C. J. Laney, Akron, Ohio.

Resolutions.—Robert I. Todd, chairman, Indianapolis, Ind.; Garrett T. Seely, Youngstown, Ohio; Samuel W. Greenland, Fort Wayne, Ind.

Rules Governing Interchange of Equipment.—John F. Collins, chairman, Jackson, Mich.; F. R. Coates, Toledo, Ohio; F. W. Coen, Sandusky, Ohio; G. B. Dobbin, Akron, Ohio; Harry Reid, Indianapolis, Ind.

Education and Training of Employees.—James P. Barnes, chairman, Louisville, Ky.; H. C. DeCamp, Westinghouse Electric & Manufacturing Co.; Edwin M. Walker, Terre Haute, Ind.

Standardization and Bureau of Standards.—H. H. Buckman, chairman, Scottsburg, Ind.; P. V. C. See, Akron, Ohio; J. W. Osborne, Lebanon, Ind.; G. H. Kelsay, Elyria, Ohio; John oll, Louisville, Ky.; M. F. Skouden, Anderson, Ind.; Charles Ellis, Cincinnati Car Co.; K. D. Leavitt, Dayton, Ohio; R. C. Taylor, Taylorville, Albion, Mich.

Uniform Changes for Repairs to Interchanged Equipment.—F. W. Coen, chairman, Sandusky, Ohio; J. W. Glendenning, Jackson, Mich.; Harry Reid, Indianapolis, Ind.

Program.—Samuel W. Greenland, chairman, Fort Wayne, Ind.; F. D. Carpenter, Lima, Ohio; H. A. Nicholl, Anderson, Ind.; L. G. Parker, Cleveland Frog & Crossing Co.; H. C. DeCamp, Westinghouse Electric & Manufacturing Co.

Transportation.—Harry Reid, chairman, Indianapolis, Ind.; C. J. Laney, Akron, Ohio; J. F. Starkey, Sandusky, Ohio; W. S. Rodger, Detroit, Mich.; Bert Weedon, Indianapolis, Ind.

Electric Railway Express.—C. J. Laney, chairman, Akron, Ohio; W. S. Rodger, Detroit, Mich.; J. F. Starkey, Sandusky, Ohio; G. K. Jefferies, Indianapolis, Ind.; H. A. Nicholl, Anderson, Ind.

Supplymen.—E. C. Folsom, Railway Materials Co.; C. B. Arthur, Universal Lubricating Co.; W. D. Hamer, W. D. Hamer Co.; Nic LeGrand, National Safety Car & Equipment Co.; H. C. DeCamp, Westinghouse Electric & Manufacturing Co.; C. F. Wickwire, Ohio Brass Co.; L. G. Parker, Cleveland Frog & Crossing Co.; C. Dorticus, General Electric Co.; Myles B. Lambert, Westinghouse Electric & Manufacturing Co.; J. E. McLain, Trolley Supply Co.; James H. Drew, Drew Electric & Manufacturing Co.; F. N. Root, Root Spring Scraper Co.

Track and Roadway.—F. R. H. Daniels, chairman, Indianapolis, Ind.; T. H. Sundmaker, Springfield, Ohio; L. A. Mitchell, Anderson, Ind.; A. V. Brown, Sandusky, Ohio; H. D. Sanderson, Jackson, Mich.; E. D. Eckroad, Akron, Ohio.

These Ties Have Long Life

SOME facts regarding track laid with cedar ties in 1869 by the Chicago, Milwaukee & St. Paul Railroad were recently reported by the railway maintenance engineer. After fifty-two years about 2,000 of the original ties, or 15 per cent, are still in the track. The ties are in a stretch of 14 miles between North Milwaukee and Cedarburg. During the period mentioned the track has been relaid with several sections of rail, and the ties have also undergone one shifting and shortening.

Auto Transportation in California

Motor Truck and Bus Must Get Permission to Operate for Hire Over the State's Improved Highways—A Veritable Network of Auto Lines

A MARKED feature of the work of the California Railroad Commission during the year ended June 30, 1920, according to the commission's report, resulted from the development of the state's youngest utility—transportation by motor truck and stage. Given impetus during the war by the demand for added transportation facilities, the auto, both freight and passenger carrying, developed rapidly as a common carrier. California's wonderful road system lent itself to this development. Today the state is served by a veritable network of auto lines, and the demand for operating permits is ever increasing. The extent of this type of service is indicated by the number of certificates issued by the commission. There are about 900 legally established operative rights on file.

The usual mistakes have been made during the course of its development prior to the time jurisdiction was vested in the commission. Inexperienced persons, armed only with a desire to enter the auto traffic field, without any knowledge of the dangers that lurk in all new businesses, without training to fit them for conducting a transportation utility (except ability to drive a truck or car), took advantage of the fact that there was need for additional carriers and entered the lists. The number of transfers of permits authorized by the commission shows better than anything else the fate of the pioneers. Exigencies of the rapidly growing service, resulting from financial needs and traffic demands, which they could not meet, forced them to dispose of their routes. This later development, under the extended jurisdiction of the commission, has been carefully guided. Today the auto transportation field is receiving the most careful attention. Haphazard operation is not possible; permits are issued only on a showing that public convenience and necessity require additional transportation facilities in the district sought to be served. There has been established by this commission a high standard of service by auto carriers, maintained through a system of inspection, that insures for the traveling and shipping public a maximum of safety and comfort and efficiency. Rules and regulations have been designed by the commission for the guidance and control of the public patronized auto, and their enforcement, in the opinion of the commission, will ultimately result in the high standard of service sought.

One of the reasons for this auto transportation development is that in the last nine years the counties of California have spent more than $125,000,000 on highway development. In this time the state has also spent $50,000,000, so that now there is said to be in California five times the mileage of hard surface roads that exist in any other state. The climate is conducive to all-year-round automobile travel and electric railways must concede that these two things are bound to increase automotive competition.

Competition, however, is not altogether an urban proposition, for it is possible to travel from San Francisco to Los Angeles, a distance of more than 500 miles, by auto bus. All motor buses operating outside the city limits come under the jurisdiction of the Railroad Commission.

Recent Happenings in Great Britain

From Our Regular Correspondent

Increasing attention attaches in England to the trackless trolley because of the general need for economy and the desire to make haste slowly with respect to expenditures for new undertakings. In London, on the other hand, the coordination plan for the transit lines appears to be off for the present. The news, however, all points to the spirit of caution with which changes of all kinds are being approached.

FROM several parts of Great Britain comes evidence of a pending development of the use of the trackless trolley system. For a number of years a few installations of this system have been in successful use in England, but hitherto it has not been largely adopted. Before the war tramway track construction as well as labor were comparatively cheap, so that a tramway could meet expenses though the traffic was not very heavy. The railless car was accordingly used on routes where traffic was really light.

Even in districts of that sort some traction authorities preferred the petrol motor omnibus, partly because it is not confined to fixed routes of travel and partly because there is no initial expenditure on providing and erecting poles and overhead wires. There is also the fact that in many cases Parliamentary powers are necessary to authorize the poles and wires, while, except in the case where a local authority is the operator, no Parliamentary sanction is required to run petrol omnibuses.

TRACKLESS CAR COSTS LOW

All along, however, the trackless electric car could be worked at a lower cost per mile run than the automobile bus, and since the war this difference has been accentuated owing to the fact that the price of petrol has gone up more than the price of electricity.

Some tramway authorities—indeed probably a good many of them—possess Parliamentary powers to construct extensions which have not been carried out owing to the prohibitive cost of track construction. Other tramway undertakings would no doubt during the last two years have sought powers for extensions, but have refrained for the same reason. Most of the contemplated lines would be on suburban routes of light or medium traffic. To meet this case, therefore, the trackless trolley system is having a favorable eye turned on it.

In Bradford especially there is much prospective activity in this direction. There is the drawback that it seems to a local authority even if engaged in working tramways cannot work trackless cars without getting specific Parliamentary authority. Even if this is so, the difficulty is far from insuperable. So far, however, as Bradford is concerned, the powers now exist for the Bradford Town Council has already run trackless trolley cars, and the same is true of several other local authorities. The Minister of Transport has agreed to Bradford Town Council operating one-man railless electric vehicles, so further economy is in sight.

R. H. Wilkinson, the borough tramway manager at Bradford, has designed a car of the sort which will be driven by one electric motor. It is a single-deck car and will seat thirty passengers. To remove objections to the weight of a larger double-deck trackless car, Mr. Wilkinson has got out a design for a six-wheel vehicle. Half the weight is on the rear axle and the other half distributed equally between the other two axles. The seating capacity is twenty-four on the lower deck and thirty-three on the upper, and the overall length is 23 ft. 10 in. A 60-hp. motor will be used.

The Town Council at Leeds, which also already run trackless cars, is about to experiment with a vehicle of this kind fitted with penumatic tires. It will be double-deck car seating fifty passengers in all. Another novelty is that the drive from the motor will be through the front wheels. In Glasgow it is proposed to proceed with the construction of some authorized tramway extensions, and also to experiment with the trackless trolley system on one route.

The prospect of a co-ordinated development of all methods of London local passenger transportation has again been postponed indefinitely. Sir Eric Geddes, Minister of Transport, stated in the House of Commons on March 21 that a bill for the establishment of a London Traffic Authority had been under consideration by the government but in view of the general need for economy, both in money and in Parliamentary time, it had been decided that it was not desirable to proceed with the bill at present. Moreover, the proposal was so highly contentious that it seemed impossible to deal with it until some of the matters in dispute had been eliminated. Further, it seemed hopeless to carry out the proposal unless the British Exchequer financed it, and that was a matter of great difficulty at present.

TRAFFIC BOARD FOR LONDON

It may be recalled that within the last year or so a select committee of the House of Commons and an advisory committee of the Ministry of Transport after inquiries recommended the constitution of a traffic board for London to co-ordinate services and guide new development. This proposal only confirmed the recommendations of various expert bodies which examined the subject in past years. Broadly it may be said that the transport undertakings of the metropolis are in favor of having a traffic board, but there are so many local authorities and other bodies entitled to have a say and there is so much difference of opinion among them that prospects of a solution are not bright. Apart from that the government is now engaged in a great economy campaign. It is cutting down expenditure in many directions, and there is little chance of any new expenditure being sanctioned except for objects that are urgently necessary.

LARGEST BRITISH POWER STATION

One or two interesting points may be cited from the speech of R. P. Sloan, manager of Newcastle-upon-Tyne Electric Supply Company, at the annual meeting which was held on March 22. The company, long a successful one, supplies electricity for many purposes, including traction. Mr. Sloan said that the profits for the year were £392,643, or £144,449 in excess of those for 1919. This was a disappointing year, as the increase was only £50,249 above 1918. The extensions of Carville power station were now completed, making this station, which now had a capacity of more than 130,000 hp., the largest electrical generating station in operation in the United Kingdom. The North Eastern Railway main line electrification scheme had not yet materialized, but negotiations had been re-opened by the railway company and there was reasonable hope that the scheme could be proceeded with although on a somewhat smaller scale than was first contemplated. In the event of the scheme maturing and proving a success there was every likelihood of its leading to much larger developments.

J. H. Armstrong, the chairman, referred to his retirement from that post and said that on his suggestion Mr. Sloan would become chairman and managing director. Mr. Sloan had been manager for more than sixteen years. He came to the company with the birth of the power scheme—the first one to be established in the United Kingdom and he believed in the world—and had nursed it into the powerful and well-developed being it was now. Mr. Armstrong will continue in office as vice-chairman of the company. He received from the meeting tributes of appreciation of his services.

Proposals are being made by Manchester and by some other places to give the local authority power to prevent other vehicles from being driven past tramcars on the nearside when the cars are stopped for setting down and taking up passengers. The idea is to secure the safety of passengers, and though the plan has been worked for some time in Glasgow it seems likely, in the case of streets of very dense traffic, to cause much street obstruction.

Arrangements are being pushed forward for electrifying the whole of the cable tramway system of Edinburgh at an estimated cost of £825,000. The manager is of the opinion that the saving in working expenses will more than cover the interest and sinking fund charges on the new capital.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Franchise Surrendered

Duluth Street Railway Company Goes Under New Law, but Rejects Cost-of-Service Proposal

The Duluth (Minn.) Street Railway has elected to operate under an indeterminate permit perpetuating the existing franchise grants and permitting fares to be fixed by the State Railroad & Warehouse Commission, under authority of a statute passed by the 1921 Legislature. At the same time the company has announced its intention to reject the cost-of-service franchise, prepared by a committee of Duluth engineers. The company's attorneys hold that the proposed franchise conflicts with the city charter in so far as the provision with reference to rates is concerned.

Request for an indeterminate permit has been filed with the city clerk and under the law recently passed by the Legislature it becomes the duty of that officer to furnish the company with a certificate, which is then filed with the Secretary of State. The city, in turn, is also required to issue the indeterminate permit. Under the proposed engineers' franchise the rates would be determined by means of a contract between the city and the company providing that the fare charged should vary inversely with the dividend rate allowed.

As noted in the ELECTRIC RAILWAY JOURNAL for April 30 the recent legislation gives to the City Council complete control over services, extensions and routing and makes the local governing bodies parties to the valuation proceedings before the state commission. The state commission, however, is given exclusive and initial right to regulate rates, subject to appeal to the courts. Indeterminate permits are authorized to take the place of the present franchises of the railways. These permits, however, are subject to revocation by the Legislature.

In Duluth the company will withdraw its action now pending in the federal court by which it hopes to obtain a temporary injunction against the city from proceeding with an action in the state courts to enforce it to give additional service on several of its lines, providing that the State Railroad & Warehouse Commission looks favorably on an application for an increase in fares.

A. M. Robertson, president of the Duluth Street Railway, has made a statement covering the company's views on the matter of the rejection of the proposed cost-of-service franchise and on its election to proceed under an indeterminate permit. He said in part:

> Our attorneys have given us legal opinion that the cost-of-service franchise prepared by the Engineers' Club, with reference to rate of fare, is in direct conflict with the city charter and could not be made operative without an amendment to the city charter. In view of this opinion there is no other course open to the company than to file with the city clerk written declaration that it desires that its existing franchise grants shall become an indeterminate permit under the provisions of chapter 278, laws of Minnesota, 1921.
>
> It is of the utmost importance that the company obtain financial relief through an increase in fare, which will enable it to make necessary permanent improvements, render satisfactory service and give to its stockholders a reasonable rate of return on a fair value of the company's property, as provided for in the state law. The company will, as soon as possible, make application to the Railroad & Warehouse Commission for an emergency or temporary rate of fare pending a valuation of the property.
>
> The officers of the company believe that the new state law affords a foundation upon which its credit may be restored and which will put it in a position to meet the demands of the city for extensions, additional service and permanent improvements, as the same are needed from time to time.
>
> As soon as the company shall receive the needed financial relief through increased revenues it proposes, in co-operation with the City Council, to do first those things for which there is the most pressing demand, and it asks from the City Council and the people of Duluth reasonable co-operation in its efforts to build up the property to its pre-war physical condition.

Injunction Invoked in New Orleans

In anticipation of hostile action by the State authorities to the collection of the present 8-cent fare Receiver O'Keefe of the New Orleans Railway & Light Company petitioned Judge Foster, of the Federal District Court, for a temporary injunction against the Attorney-General and Assistant Attorney-General of the State, enjoining them from bringing suit in any form against the company.

The injunction was granted on April 29, hearing upon the prayer of the receiver's petition having been set for May 3. Decision was expected to be made then whether the injunction will be made permanent or set aside and the State allowed to proceed with the suits which it is alleged Assistant Attorney-General Hall contemplates filing against the company.

The application for a temporary injunction against the State authorities grows out of threats which Receiver O'Keefe alleges Judge Hall, Assistant Attorney-General, has made in the public press and elsewhere of taking action against the railway or some of its units for forfeiture of charters, franchises and rights.

It is further alleged by Receiver O'Keefe that such action is contrary to the decree of Judge H. B. Clayton, issued on April 21, in which the city was enjoined from interfering with the collection of an 8-cent fare by the railway.

Ambitious Missouri Project

Preliminaries Being Arranged for Construction of Electric Railroad from Kansas City to St. Louis

The Missouri Central Construction Company is underwriting and doing construction work on an electric interurban railway to connect Kansas City and St. Louis, 248 miles. The line is to be known as the "St. Louis-Kansas City Short Line." The company has now secured three-fifths of the right of way, and more than 30 miles are now graded. It is said that $380,000 has to date been put into the project. The company is moving slowly, with a minimum of local publicity through the state and at terminal cities.

Two of the principles governing location of route hold particular interest. The electric line is being located to serve rural Missouri between the terminals, and therefore (1) avoids rather than touches the larger towns; (2) does not parallel closely the steam lines.

The company is not selling stock to farmers, nor offering it to them, in connection with right-of-way negotiations. This policy was taken because of the possible implications that might rest against the company should it make stock subscriptions a condition of route location. It is said that one of the most serious handicaps to present location and securing of right-of-way is the remembrance by farmers of previous similar projects not carried through in connection with which stock was sold to farmers selling land for right-of-way.

The president of the Missouri Construction Company is George R. Collins, president of the National Benevolent Society, a fraternal insurance organization with headquarters at Kansas City. Mr. Collins was active in securing a right-of-way between Kansas City and St. Joseph, Mo., a suit concerning this right-of-way resulting in a judgment under which the Kansas City, Clay County & St. Joseph Railway paid a large sum to Mr. Collins and associates, this company eventually building and operating an electric interurban between the two cities.

Thomas F. Marshall, vice-president of the company, is a capitalist at Marshall. He is active in the work of securing right-of-way. Harvey D. Taylor, secretary, is an attorney. Frank E. Lott, treasurer, is a real estate operator at Kansas City, who has been active for several years in promoting the enterprise. The consulting engineer is W. B. Cauthorn, Columbia, Mo. The right-of-way office is at 501 Finance Building, Kansas City.

Philadelphia Wages Cut

Seven and One-Half Cents Taken Off Trainmen Under Wage Average Plan

Announcement was made on April 28 by the Philadelphia (Pa.) Rapid Transit Company that a general reduction of 7½ cents an hour would be made in the wages paid to the company's trainmen, the reduced wage scale to become effective on May 1. It is also proposed to reduce the wages of track laborers, trackmen, pavers, rammers, switch cleaners and drivers by 14½ cents an hour, this cut also to become effective at once.

The change in wages, it was said, will adjust the company's scale to the average of the scales of the railways in Buffalo, Cleveland, Detroit and Chicago, on which average the Philadelphia scale is based. In three of those cities a reduction in wages has been declared, thus lowering the average for the four. Adjusting the Philadelphia scale to the new average, it is said, will enable the Rapid Transit Company to save $1,000,000 or more a year. The company's announcement was as follows:

The co-operative plan for collective bargaining of the Philadelphia Rapid Transit Company provides as a basis for determining wages the average of the wage scale of the street railway companies of Buffalo, Cleveland, Detroit and Chicago.

In conformity with the wage decrease of the Cleveland Railway and the Detroit United Railway to be made effective on May 1, 1921, the general committees under the co-operative plan agree that the scale of wages (in cents per hour) of the trainmen of the Philadelphia Rapid Transit Company to be established effective as of May 1, 1921, should be as follows:

Surface motormen and conductors	60, 63 and 65
Elevated motormen	63, 66 and 68
Elevated conductors	60, 63 and 65
Elevated guards	60, 62 and 63

In conformity with the decreases made in Cleveland and Detroit, effective on Jan. 1, 1921, and in Buffalo to be made effective on May 1, 1921, the wage scale of the regular employees of way department track forces, namely: track laborers, trackmen, pavers, rammers, switch cleaners and drivers, should be reduced 14½ cents an hour, effective May 1, 1921.

In conformity with the wage decrease of the Cleveland Railway and the Detroit United Railway the wage rates of other employees who received the increase of 7½ cents an hour, or $15 a month, effective on June 1, 1920, and those employees who have been engaged at wage rates including the June 1, 1920, increase, should be decreased 7½ cents an hour or $15 a month, effective on May 1, 1921.

Wage Cut Rejected in Salt Lake

Platform, shop and track employees of the Utah Light & Traction Company, Salt Lake City, Utah, have voted unanimously to reject the proposal of the company to reduce wages, ranging from 14 to 20 per cent. All other conditions of the proposed new working agreement, to run from May 1, 1921, to May 1, 1922, have been accepted by the employees. Arbitration of the wage section of the new agreement has been asked by the employees. H. F. Dicke, general manager of the company, states, however, that the question of arbitration will have to be passed on by the directors of the company. It is claimed by Mr. Dicke that the arbitration clause in the present contract provides for arbitration of questions concerning the present contract, and does not cover negotiations in regard to a new contract.

The present shop scale is from 50 cents to 68 cents an hour. It was proposed to cut this scale approximately 20 per cent, making it from 40 cents to 56 cents an hour.

At the present time the trackmen are receiving a maximum wage of $5.25 and a minimum of $4.50 for a nine-hour day. The company proposes a maximum of $4.20 and a minimum of $3.60 for the same length of workday.

Platform men are receiving at the present time a maximum of 64 cents an hour for a nine-hour day. It is proposed to reduce this maximum to 55 cents an hour. The minimum pay of trainmen is 57 cents an hour. This it was proposed to cut to 48 cents an hour. The reductions here are approximately 14 per cent. The proposed minimum of 48 cents an hour would prevail only for first-year platform men, their wage thereafter to be 55 cents an hour.

New Utility Bill Submitted in Illinois

Plans for a radical change in the Illinois public utilities law will probably come to a head in the Legislature of that State in the near future. This is in accord with the campaign pledges made by Governor Small. A draft of the new bill has been submitted and while it is subject to change it is expected to be approved with the important features retained.

Summarized, this bill provides for a repeal of the present public utilities act and abolition of the present commission. It also provides that in case a contract is entered into between a city and a public utility concerning rates or service, this cannot be abrogated except by a majority vote of the people in the city affected. The people of any community would also be permitted to adopt home rule through its council or any governmental commission. Likewise, home rule may be abandoned by majority vote of the people. Any public utilities which are not within a municipality and all public utilities in municipalities which do not adopt home rule are to be placed under the jurisdiction of the Illinois Commerce Commission. This commission would consist of seven members to be appointed by the Governor for terms of four years. There would also be eight assistant commissioners to hold hearings or make investigations. Appeals from the commerce commission would be taken to the Circuit Court of the county in which the case arises.

The Governor has been working in harmony with the Chicago city administration which is endeavoring to form a transportation district with electric railway service based on a 5-cent fare and taxation to make up any deficit which may occur.

Fifteen Cent Reduction

Final Proposition Made by Manager Blinn at Akron—Arbitration Likely

In referring further to a discussion which took place on April 14 between representatives of the Amalgamated and officers of the Northern Ohio Traction & Light Company, Akron, Ohio, in regard to wages to be paid trainmen beginning May 1, A. C. Blinn, vice-president and general manager of the company, said in a communication to the men dated April 22 that the question of wages must be determined not only by the cost of living, but by the company's financial condition. He said that it was his understanding that the proposal made on April 14 had been rejected. A marked reduction from the present wage scale was absolutely necessary. He submitted as final:

1. A straight reduction of 15 cents an hour from the present scale.
2. Submission of the entire question of wages to arbitration if the proposed wage scale was not accepted.

Under the reduction suggested the wages in cents per hour would be as follows:

	City Lines	Suburban Lines	Interurban Lines
First year	44	45	50
Second year	47	48	52
Thereafter	50	51	55
Brakeman	50	50	50

Three cents per hour additional over the city scale would be paid for the operation of one-man city cars:

Mr. Blinn further explained that in case the first proposition was accepted the following working condition should prevail:

The company reserves the right to make and change all schedules; said schedules to provide for necessary lay over.

All runs on working schedule shall conform to a ten-hour work day as near as possible.

All runs on working schedule to be not less than eight hours. Working schedule shall not include tripper runs.

Motormen, conductors or brakemen working runs of eight hours or more who are called to work extra shall be paid time allowed plus one hour.

Any motorman, conductor or brakeman assigned for work at a specified time, and if for any reason, not their own, do not start to work at the time specified, shall be paid for the time elapsing between the time they reported and the time they actually started work in addition to time worked.

Any motorman, conductor or brakeman assigned for work at a specified time and on account of the weather or for other reasons, not their own, do not do any work, shall be allowed one hour time for reporting.

Motorman and conductor who properly make out accident report or reports, at the completion of their day's work and same is O.K.d by dispatcher on duty will be paid for one hour's time.

Mr. Blinn further said that in the event the second proposition was accepted the working conditions previously noted should likewise be subject to arbitration, the board of arbitration to settle the question by May 20.

The men rejected the company's arbitration proposal on Tuesday night and threatened an outlaw strike. P. J. Shea, international officer, declared the charter would be taken from the local organization if the men walked out on Thursday as threatened.

$32,000,000 Terminal Improvement

Electric Interurban and Steam Lines at Los Angeles Ordered to Start Work at Once on New Union Depot

The Railroad Commission of California has ordered the Southern Pacific, Santa Fe, Los Angeles and Salt Lake Railroad Companies and the Pacific Electric Railway at Los Angeles to proceed with the construction of a union passenger station on the Plaza site. Construction of the station, as set forth by the commission, is considered as the first step in a comprehensive plan of transportation development in Los Angeles, embracing the gradual elimination of all the important grade crossings in the city.

THE commission orders that the railroad lines, affected by the order, must name a joint committee in thirty days, while plans for the union depot must be filed within six months. In the event that the committee is unable to agree upon a chairman, this official will be selected by the Railroad Commission.

The commission states that the Pacific Electric's most urgent service and traffic problems dealing with the Hill Street and Hollywood situation are not affected by the present proceedings and nothing contained in same will prevent or need delay a partial or complete solution of these difficulties. Both the Pacific Electric and the Los Angeles Railway, said the commission, will have to make provision for adequate local street railway service to and from the new union passenger depot which is proposed.

In concluding its reference to the terminal controversy, the commission said that, in selecting the Plaza site, it "assumes that the city will carry out its repeatedly announced intention to further in every possible way the consummation of the general plan, which by resolution the city authorities have so strongly urged the commission to promulgate in these proceedings."

The commission indicated that it was not practicable at this time to deal extensively with the matter of cost and division of expenditure, and that these features would be reserved for a subsequent decision. The cost of the Union Station would be much less than that of the entire plan, the commission stated, and the figure would be made known after the plans of the engineering committee have been filed with the commission. The commission declared it was not contemplating an unreasonably large expenditure, and that the Southern Pacific and Salt Lake Roads, and the Pacific Electric Railway contemplated the expenditure of approximately $17,000,000 for incomplete development.

The campaign for a union terminal in Los Angeles began in the year 1911, following a series of grade crossing accidents in the city and county, and the Railroad Commission was petitioned to order the elimination of grade crossings. Fearing that it lacked full authority to cope with the situation, the commission ruled against itself to get the opinion of a higher court. When an appeal was made to the State Supreme Court the commission was informed that it had full authority in the premises and that it should lose no time in satisfying its petitioners.

Richard Sachse, chief engineer of the commission, was placed in charge of the work, and with his staff of engineers spent two years in preparing a study and survey of the traffic conditions in the city of Los Angeles. This survey covered more than 1,000 pages when it was finally completed.

At the time Mr. Sachse reported on this union terminal to be located at the Plaza, in accordance with his recommendations, it was stated by him that the completed improvements could be had for $32,233,445. His report figured grade crossing elimination along the Los Angeles River at $4,596,000; carrying this work through to Pasadena, $6,700,000; Butte Street trackage, $192,000; union passenger terminal and yards, $10,933,000; union freight station, $2,575,000; new freight yards, $2,835,000; doubling tracking from Los Angeles to Colton, $136,000 (S. P. Lines); team yards, $629,000; additional trackage, $710,000; subway and elevated work, $5,741,000; release of sites, $2,800,000.

Throughout the proceedings, all three of the steam roads and the Pacific Electric Railway opposed the union passenger terminal proposed. It is apparent that the railroads intend to appeal to the courts before they submit to the commission's orders—that the matter will first be carried to the Interstate Commerce Commission, then to the highest courts of the United States, if necessary, in order to obtain relief from what the railroads term a drastic order of the commission.

Tacoma Company Cannot Proceed with Extensions Now

At a public meeting held in Tacoma, Wash., recently, attended by members of the City Council, officers of the state department of public works, and officials of the Tacoma Railway & Power Company, 300 residents of the so-called Jefferson Square District, lying between Sixth Avenue and the Point Defiance car line, presented their urgent need of extensions to street car service, and received assurances of the city and state officials that the matter would be thoroughly investigated.

E. V. Kuykendall, state director of public works, stated that the state engineering department would take any action found necessary by the investigation. Tacoma Railway & Power Company officials present explained that the company had been unable to extend the line because its returns were insufficient.

N. L. Robbins, statistician of the company, presented figures to show that the cost of operating one extension of the line would be $51 a day, with estimated income of $20.36. He pointed out that since 1918 the company has been trying by various means, such as bus and stage lines, to cover this district, all efforts being financially unsuccessful. Richard T. Sullivan, manager of the company, stated that during the year 1919 the company lost $103,000 in operating its lines in Tacoma and that while the present outlook was more hopeful the company could not be burdened with any further expenditures until returns had begun to show an increase. He expressed his willingness to co-operate in any way to secure the extensions.

Strike Narrowly Averted

Walkout of Detroit United Employees Put Off for Week Pending Resubmission of Pay Cut

After employees of the Detroit United Railway had voted eight to one in favor of suspension of work and the City Council had met with the Mayor to consider the situation a conference between the company officials and the representatives of the four unions resulted in a truce which averted for at least one week the threatened tieup.

At the conference the day before the company's proposed reduction of 20 per cent to 28 per cent in its platform men's wages was to go into effect an agreement was reached whereby the company agreed to postpone for one week the posting of bulletins announcing the wage reduction. In event the men accept the company's proposal at the end of the week the reduced rate will be retroactive from May 1.

After a conference the president of the Amalgamated Association and company officials expressed the belief that the questions voted on by the men had not been thoroughly understood when they voted to reject the proposition submitted to them and empowered the joint committee to call a strike. The propositions on which the men voted are:

1. Do you favor acceptance of the company's proposed working agreement based upon the Cleveland agreement calling for a wage scale of 55, 58 and 60 cents an hour?
2. Do you favor submitting the entire question of wages, hours and working conditions to a board of arbitrators?
3. Do you authorize a suspension of work, if necessary?

According to a report on the ballot, 273 of the union members voting favored the first plan, 154 were in favor of arbitration according to proposition number 2, and 3,321 voted to authorize a walkout.

The vote Saturday is the outcome of negotiations carried on by the company and the men since the company announced its proposed wage cut from 70, 73 and 75 cents an hour to 50, 55, and 60 cents an hour, effective on May 1.

The unions voted unanimously to reject the cut and offered to arbitrate the question of wage reduction only. The company in turn insisted that any arbitration must include the entire working agreement between the company and the unions. No agreement being reached the company offered a new plan based upon the Cleveland wage scale of 55, 58 and 60 cents per hour.

Announcement by Mayor Couzens that the street railway commission would reduce the wages of employees of municipal lines from 70, 73 and 75 cents an hour to 55, 58 and 60 cents an hour was followed by a vote of the city employees to follow the union lead.

It will be explained to the men that the offers made by the company are the only conditions that can be secured without a strike. With this in view the representatives of the union asked the company to withhold the bulletins for seven days and leave the proposition that they had submitted stand for the men to consider and ballot on again. To this the company agreed.

Elevated Men Accept Cut

New Agreement between Trustees and Amalgamated Involves Reductions to Take Effect in Installments

The trustees of the Boston (Mass.) Elevated Railway have entered into a new agreement with their employees who are members of the Amalgamated Association, involving wage reductions of from 7 to 10 per cent, effective during the twelve months beginning July 1. For blue uniform men who have reached the senior grade of pay—after one year's service—the reduction is to be 7 per cent, divided into two parts, approximately half the reduction being applied July 1, and the balance Jan. 1, 1922. For the balance of the employees under the Amalgamated agreements the straight reduction of 10 per cent will be effective July 1.

As practically all the blue uniform men now employed are of the senior grade, the company will only save about 3 per cent on trainmen's wages during the first six months of the new agreement. It is estimated that the total savings to the company, under this new agreement will be approximately $1,000,000 during the twelve months. The total wages for 1920 were $17,216,445.

A considerable number of employees who are working under agreements of the various skilled crafts unions are not affected by this new wage scale, but as their various agreements expire it is not unlikely that they may be renewed with moderate reductions in wages to conform to labor market conditions in Boston.

The negotiations attendent upon the formation of this new agreement were unique because of their brevity and harmonious character. After brief preliminaries between the officials representing the company and the men, the wage proposals were submitted to vote of the union membership and accepted without dissent in less than two days.

The old agreement expires, as far as wage scale is concerned, July 1, and sixty days' notice is required of either party of any desire to change any portion of the agreement.

The wage scale (in cents per hour) for blue uniform men as at present and as agreed for the next year follows:

SURFACE TRAINMEN

	Present	July 1 to Jan. 1	Jan. 1 to July 1
Minimum (3 months)...	58	52	52
Intermediate (9 months)	64	58	58
Maximum (thereafter)..	70	68	65

Operators of one-man cars are to receive a differential of 10 cents an hour, instead of 15 cents as at present.

It is expected that other than the wage scale, the old agreement will be renewed without any important changes in working conditions. Minor matters are now being negotiated. The 8-hour day with 60 per cent of all runs coming inside an 11-hour spread is in effect. The trustees issued the following statement to the men as indicative of their policy:

MOTORMEN—RAPID TRANSIT TRAINS

	Present	July 1 to Jan. 1	Jan. 1 to July 1
Minimum (3 months)...	65	61	61
Intermediate (9 months)	66	62	62
Maximum (thereafter)..	72	70	67

GUARDS—RAPID TRANSIT TRAINS

	Present	July 1 to Jan. 1	Jan. 1 to July 1
Minimum (3 months)...	62	56	56
Intermediate (9 months)	63	57	57
Maximum (thereafter)..	65	63	60

> In reaching this conclusion the trustees have given consideration and weight:
>
> 1. To the fact that although a substantial decrease has already taken place in many items affecting the cost of living that cost is not yet upon any settled basis so that it is peculiarly a fitting time to put in practice the belief of the trustees that to be consistent they should be as deliberate and conservative in following the cost of living when it is upon a downward trend as in following it when it is in an upward movement.
>
> 2. To the fact that the trustees thoroughly appreciate the co-operation that the men have given to the management during the past year which has made possible what would otherwise be impossible in the saving of expenditures amounting to large economies; in other words the existence of the spirit which has financial as well as other value in the conduct of this service.
>
> 3. The fact that as public officials they are in charge of a public business entirely disconnected from any private or competitive industries and that in this attitude they should be careful not to adopt as a standard for the payment of compensation any other rule than that of a full fair wage for work that is earnestly performed.

Wages Reduced in Lexington.—Wages of motormen and conductors employed by the Kentucky Traction & Terminal Company Lexington, Ky., have been reduced 5½ cents an hour. The reduction was made through agreement between A. A. Babblitz, Lexington, arbitrator for the men, and George MacLeod, Versailles, arbitrator for the company. The negotiations were based, it was stated, upon an agreement between the men and the company which provided for changes in the wage scales in accordance with cost of living increases and decreases as reported by U. S. Department of Labor. The minimum wage under the new agreement is 38½ cents an hour and maximum 41½ cents.

Strike Averted

Eastern Massachusetts Company and Employees Agree to Arbitrate Wages and Other Details

Through concessions made at practically the last moment by both the company and the employees, the expected strike on the lines of the Eastern Massachusetts Street Railway failed to materialize on May 2 as anticipated. The important question of the handling of discipline cases was settled in conference, and with this point finally agreed upon, both sides consented to leave the question of wages and other details to the Massachusetts State Board of Conciliation and Arbitration. The company withdrew its demand for settlement on the open shop basis, in view of the agreement on the discipline question.

A three-cornered agreement has been made between the company, the employees and the State Board, looking toward a prompt hearing and settlement of the entire problem. James H. Vahey, the attorney for the Amalgamated Association, is to take not more than two days to present the case of the employees, the company is to have the next two days, and the State Board in turn has agreed to render its decision on or before Saturday, May 14. Many of the minor points of the new agreement were settled in conferences.

The handling of discipline and discharge cases was the stumbling block which kept both sides from getting together sooner. Under the old agreement, the trustees found themselves embarrassed in maintaining discipline, due to the fact that any man discharged by the company could go before his local union, demand arbitration and secure it on a favorable oral vote. In its practical application, this meant that the management had before it the likelihood, if not certainty, of arbitration in every discipline case.

In the new agreement, a man who is discharged will have the right of appeal to the assistant general manager. If dissatisfied with his decision, he may appeal to the labor committee, consisting of four members named by the vice-president, the assistant general manager, the general counsel and one of the trustees. Failing to be satisfied with their decision he may go before his local union and request arbitration. If his union sustains him, by ballot, his case is first to be reviewed by Trustee Wadleigh and Attorney Vahey, who will make a report on it. If they report against the man or disagree, another referendum vote of the local union is required before the actual arbitration proceedings are undertaken.

This procedure is designed to permit of the most thorough review before resorting to the expense of an arbitration.

It was not until this point was settled on the above described basis, on Saturday, April 30, that both sides agreed to leave the wage scale and other contested questions to the State Board of Arbitration.

Franklin Medal to Frank J. Sprague

The Franklin Institute of the State of Pennsylvania will hold a meeting on May 18 for which an interesting program has been arranged. A certificate of honorary membership will be presented to John J. Pershing, General of the United States Army. M. Jusserand, the French Ambassador, will be presented with the Franklin Medal and certificate of honorary membership on behalf of his government for Professor Charles Fabry, University of Paris. Frank J. Sprague will also be honored with the Franklin Medal and certificate of honorary membership. After other honors have been conferred papers will be read. "Studies in the Field of Light Radiation," prepared by Charles Fabry, D.Sc., will be read by Joseph S. Ames, Ph.D., the Johns Hopkins University, Baltimore, Md., followed by "Electric Traction—A Review," by Frank J. Sprague.

News Notes

Accept Wage Cut.—Employees of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., have decided to accept the 25 per cent wage reduction pending settlement by a board of arbitration. The possibility of a strike is now averted. Conferences will continue between the railway and men and an agreement may be reached before arbitration proceedings are started.

Bus Company Makes Improvements.—The Central Auto Stage Terminal, a company organized by twenty-one motor stage lines operating eighty stages out of Seattle, is remodeling a two-story masonry building at Western Avenue, Madison, Post and Marion Streets, from which approximately 5,000 passengers will be discharged and loaded daily. The company is expending $20,000 in improvements to the structure.

Arbitration in Syracuse.—It has been announced that arbitration will be resorted to in the wage dispute on the Rochester & Syracuse Electric Railroad, Syracuse, N. Y. T. C. Cherry, vice-president of the road, and union officials have agreed on the manner of selecting arbiters and names will be announced soon. The wage adjustment will be similar to that under which the New York State Railways' wage dispute is being settled.

More Employees Accept Cut.—Conductors and motormen of the Bay City division of the Saginaw-Bay City Street Railway voted to accept a reduction of 10 cents an hour in their pay from May 1. The action was voluntary on the part of the men, who said they realized that the jitney bus competition, practically unregulated by the city, had so reduced the revenues of the company that they could no longer pay rates under which they had a working agreement.

Arbitration in Des Moines.—The Des Moines City Railway has appointed B. F. Elbert as its representative on the arbitration board which will decide the wages of its trainmen for the coming year. The railway men's union has its representative also in line and it is expected that a third arbitrator will not be needed. This will be the seventh arbitration committee which has been formed since 1905 to settle disputes between the railway and its men. The employees recently rejected the company's wage offer which placed the maximum wage at 60 cents.

Court Hears Attack on Commission.—Justice McAvoy in the special term of the Supreme Court on April 27 heard argument made by Hiram W. Johnson, as special counsel for the city of New York, to restrain George McAneny, Major-General John F. O'Ryan and Le Roy T. Harkness, from acting as transit commissioners in New York City. Mr. Johnson also seeks an order restraining the newly appointed commissioners from taking over the books, papers, etc. Decision in the matter was reserved. Justice McAvoy allowed the attorneys five days in which to submit briefs.

Programs of Meetings

American Society of Mechanical Engineers

The Western Society of Engineers is co-operating with the Chicago committee in the preparation of a program to be presented at the spring meeting of the American Society of Mechanical Engineers at Chicago, May 23-26. This session will be devoted to a consideration of the problems of Chicago as the Rail-Water Gateway of the Middle-West.

This revelation of the magnitude and complications of one of the world's greatest railroad centers will be of vital importance. The program will be supplemented by an address on the Development of the St. Lawrence Waterway. The titles of the addresses follow:

"The Relation of Steam Roads to Rapid Transit Development," by Bion J. Arnold.

"The Function of the Terminal Survey," by J. R. Bibbins.

"Some Aspects of the Problem of Chicago as the Mid-Interior Rail-Water Gateway," by J. R. Bibbins.

"Freight Tunnel System as a Terminal Distribution Agency," by J. R. Bibbins and E. J. Noonan.

"Development of Air Rights in Connection with City Freight Houses," by E. J. Noonan.

"Freight Movement by Motor Trucks, View Point of Carrier and Public," by Hugh E. Young.

Well developed programs will be presented by the Professional Divisions of the Society devoted to forest products, fuels, machine shop, management, material handling, power, railroad, and a specially important session will be devoted to Training for Industries.

H. B. Reynolds of the Interborough Rapid Transit Company, will present the results of a series of tests on a 30,000 kw. General Electric steam turbine installed at the Fifty-ninth Street power house of the Interborough Rapid Transit Company, New York.

Southwestern Electrical & Gas Association

At the opening session of the seventeenth annual convention of the Southwestern Electrical & Gas Association at Galveston, Tex., on May 18 the president's address and report of the secretary will be heard. On May 19 at the first session of the Street & Interurban Railway Section "problems of the minute" in electric transportation will be discussed. On the afternoon of May 19 the first general session will be held at which speakers of prominence in the utility and scientific field will make addresses and answer inquiries. Among these will be Martin Insull, "The Public's Business," J. H. Gill, "The Utility Association as a Permanently Profitable Investment." At the second meeting of the Street & Interurban Railway Section the usual "Round-the-Table" session will be held. This informal "get-together" method where no technical papers are read but where the members discuss freely the status of the electric railways covered by this association (Texas and Louisiana) has proved very successful. At the second "general" session W. G. Busby, chairman, Mo. Public Service Commission, will read a paper, "State Utility Commissioners." There will also be two addresses on "Hometown Financing of Local Utilities," by those who have had recent practical experience in this matter and an address—from the banking side—on the same subject by a Texas banker.

International Street & Interurban Rail- International Street & Interurban Railway Congress

A meeting has been called to begin May 29 and end June 3, 1921, in Vienna of the International Strassenbahn und Kleinbahnverein, recently organized in Nuremberg. Papers are scheduled on the following topics:

(1) Roller bearings in street railway operation, (2) economic condition of steam railroads, (3) relation between cars and tracks, (4) outlook for the light railway, (5) co-ordination of traffic facilities in large German cities, (6) standardization and maintenance, (7) the Copenhagen street railway, (8) technical difficulties in operating a railway in Amsterdam, (9) car construction, (10) ball bearings for trolley cars, (11) psychological tests for employees, (12) proposed electric line in Christiania, Norway, (13) fares and headways and their effect on receipts; (14) high-tension direct-current railways; (15) mercury-arc rectifiers and automatic substations, (16) trackless trolleys, (17) one-man car operation.

The secretary of the association is Dr. Arthur Ertel, Favoritenstrasse 9, Vienna. The president of the association is Ludwig Spängler, general manager, Vienna Municipal Tramways.

Financial and Corporate

Twin City Earnings

Company Is Able to Increase Dividends Nearly 7 per Cent Gain in Traffic

The annual report of the Twin City Rapid Transit Company, Minneapolis, Minn., for the year 1920 indicates an improved financial condition over 1919. The net earnings of the company for the year were sufficient to declare a 3 per cent dividend on the common stock, in addition to the regular dividend on the 7 per cent preferred stock.

The accompanying tables give in detail the income account for the year in comparison with the year 1919. The percentage change is also shown. Details of the traffic handled and other miscellaneous statistical information are given in another table.

During the year the basic fare in both St. Paul and Minneapolis was raised to 6 cents. This rate became effective in Minneapolis on Aug. 16 and in St. Paul on Sept. 13. These increases in fare were made necessary by a substantial increase in wages to the men on the cars. A substantial increase in service was also made to meet the demands of the cities in return for the right to change the basic rate of fare. Practically 1917 schedules are now in operation. The results for the year, so far as traffic was concerned, were better in Minneapolis than in St. Paul.

The physical condition of the property is being improved as rapidly as the finances of the property will permit, and it is anticipated that the property will soon be restored to as good a physical condition as existed prior to the war. Cars are being remodeled to provide front exits, for which there is a public demand. Other cars are being rebuilt for trailer operation to facilitate handling rush-hour traffic more economically than with single-car operation. During 1920 nearly 13 miles of track in the downtown districts were laid in enlarging the loop facilities. The expenditure for these extensions has been justified by the company being better able to reduce congestion during the rush hours.

During the year ten-year gold notes were issued by the subsidiary companies, namely, the Minneapolis Street Railway, the St. Paul City Railway and the Minneapolis & St. Paul Suburban Railroad, as evidence of their indebtedness to the holding company, the Twin City Rapid Transit Company. These notes total $9,850,000 and are to be held in the treasury of the Twin City Rapid Transit Company until such time as the condition of the money market and the earning power of the subsidiary companies warrant their being offered to the public for general investment.

INCOME STATEMENT — TWIN CITY RAPID TRANSIT COMPANY

Year Ended Dec. 31	1920	1919	Percentage Change
Revenue from transportation	$12,879,281	$11,351,739	13.5
Revenue from other railway operations	107,125	90,705	18.1
Total railway operating revenue	$12,986,406	$11,442,444	13.5
Way and structures	1,234,266	1,102,568	11.9
Equipment	1,475,076	1,245,070	18.5
Power	1,185,182	1,175,293	0.8
Conducting transportation	4,652,777	3,788,711	22.8
Traffic	43,561	62,450	*30.2*
General and miscellaneous	1,229,237	1,090,668	12.7
Transportation for investment-credit	*25,266*	*19,702*	*28.2*
Total railway operating expenses	$9,794,834	$8,445,059	16.0
Net operating revenue	$3,191,572	$2,997,385	6.5
Taxes assignable to railway operation	1,161,507	1,126,338	3.1
Operating income	$2,030,065	$1,871,047	8.5
Non-operating income	84,332	51,034	65.3
Gross income	$2,114,397	$1,922,081	10.0
Rent from leased roads	3,000	3,000	....
Interest from funded debt	1,080,684	1,087,446	*0.6*
Net loss miscellaneous physical property	21,264	32,829	*35.2*
Miscellaneous debits	10,349	10,454	*1.0*
Total deductions from gross income	$1,115,297	$1,133,729	*1.6*
Net corporate income transferred to profit and loss	$999,100	$788,352	26.8

STATISTICAL INFORMATION—TWIN CITY RAPID TRANSIT COMPANY

Year Ended Dec. 31	1920	1919	Percentage Change
Total miles, first main track	249.79	243.07	2.9
Total miles, second main track	184.82	177.40	4.2
Total single-track miles (all tracks)	466.86	452.65	3.1
Average total trackage operated per year (miles)	454.17	451.70	0.5
Revenue passengers carried	238,388,782	222,186,823	7.3
Transfer passengers	77,531,776	73,458,262	5.5
Total passengers carried	315,920,558	295,645,085	6.9
Gross passenger revenue	$12,792,277	$11,179,535	14.4
Gross passenger revenue per mile of line (average for year)	$53,969	$47,303	14.1
Gross passenger revenue per mile single track	$28,166	$24,750	13.8
Average fare:			
Per revenue passenger (cents)	5.37	5.04	6.6
Per total passenger (cents)	4.05	3.78	7.1
Operating ratio (per cent)	75.40	73.70	(*b*) 1.70
Taxes (per cent of gross revenue)	8.90	8.90	(*b*) 0.74
Dividends paid:			
7 per cent on preferred stock	$210,000	$210,000	....
On common stock (*a*)	$660,000	$550,000	20.0

(*a*) 3 per cent in 1920. 2.5 per cent in 1919. (*b*) Difference in points. Italics indicate decrease.

Return of Trolleys to Steam Road Urged

Return of the stock of the Connecticut Company, now held by federal trustees, to the New York, New Haven & Hartford Railroad, its former owners, was urged by Vice-President Edward G. Buckland of the railroad at a hearing on a resolution containing such provisions on April 27 before the committee on railroads of the Connecticut Legislature.

Mr. Buckland said that the electric railway company's lines would continue to be operated "if they could be made to pay"; and stated that the future of the lines, so far as their operation was concerned, would not be affected one way or the other by the proposed transfer of the stock.

A history of the trusteeship was briefly outlined by Mr. Buckland. He told of the action initiated against the New Haven railroad in 1908 for alleged violation of the Sherman anti-trust law; of how the suit was dropped during the Taft administration and renewed under Wilson in 1914. The "New Haven" road then agreed to the separation of the Connecticut Company because it did not wish to jeopardize certain pending financing. Mr. Buckland read an extract from a report by Howard Elliott, then president of the road, to the stockholders in which he pointed out that the road consented to the separation only under financial pressure.

Richard T. Higgins, chairman of the Public Utilities Commission, said he believed that a public utility operating only within the state should be under the supervision of a state body and not of the federal government, adding that the stockholders who were most interested in the prosperity of the lines should be vested with responsibility and control.

George D. Watrous, New Haven, counsel for the trustees, said that the trustees did not think it necessary to appear before the committee but he gave assurance that most of them would carry out an order to release the Connecticut Company's stock.

While Mr. Watrous and Mr. Higgins were disagreeing as to the possibility of the trustees disposing of the company's physical property, Mr. Buckland interposed the suggestion that a sale of the stock might result in the acquisition of the company's property by interests "even more undesirable than the New Haven Railroad."

Canadian Road Does Well

Ten Per Cent Increase in Net Revenue Allows British Columbia Electric Railway to Pay Dividends

The annual report of the British Columbia Electric Railway, Ltd., Vancouver, B. C., for the year ended June 20, 1920, recently issued, reflects the prosperous financial condition of the country for that period. As a result of the increased population and trade expansion, the revenues of the company increased so that the annual gross receipts were the largest in the history of the company. Despite the heavy increases in the cost of operation and a proper allowance for depreciation, it was possible to declare reasonable dividends free of income taxes.

The growth of population has necessitated a substantial expenditure of capital during the past year. Past financial management has enabled the company to meet this expansion without having to issue additional securities. It was possible only because the debentures are irredeemable and consequently a considerable part of the provision for co-depreciation has accumulated in cash and is now being utilized for necessary extensions and developments. Had the debentures been redeemable, much of the provision made for depreciation would have been absorbed by the reduction funds, and it would have been necessary to ask for additional capital to meet the extensions in the community served.

Existing fares, the company says, were granted to enable it to meet the increased cost of operation, including higher wages. It is still necessary for the continuance of railway operation on an efficient basis that there should be some authority to whom appeal can be made to sustain or increase if necessary rates and fares in view of the abolition of the Public Utilities Commission.

The net income transferred to profit and loss from operation and other sources during the year amounted to £590,971 as compared with £530,327 the previous year. Adding the balance of the previous year gives a total revenue of £418,585 as against £369,105 in 1919.

STATEMENT OF INCOME—BRITISH COLUMBIA ELECTRIC RAILWAY, LIMITED

Year Ended June 30—	1920	1919	Per Cent Change
Net revenue, including profit on exchange and less depreciation in securities	£609,045	£530,182	14.8
Registration fees, etc	318	145	119.3
Total revenue	£609,362	£530,327	14.9
Charges against revenue during the year			
Depreciation, sinking fund and renewals	£164,745	£154,727	6.5
Office rent, salaries, printing, legal, audit and agency expense	18,413	9,898	86.1
Trustees' fees	877	864	1.5
Corporation profits tax	13,000	....	....
Capital amortization fund	....	1,818	....
Total charges	£197,035	£167,307	17.7
Net revenue for the year from all sources	412,327	363,020	13.6
Add revenue from previous year	6,258	6,085	2.9
Gross income	£418,585	£369,105	13.4
Deductions—			
Interest and debentures and debenture stock	132,339	132,447	— 0.08
Dividend (5%) on perpetual preference stock	72,000	72,000	....
Interim dividend on preferred ordinary stock with income tax thereon	65,032	36,000	80.5
Dividend on deferred ordinary stock with income tax thereon	£115,200	£86,400	33.4
Dividend on preferred ordinary stock with income tax thereon	21,368	36,000	— 40.6
Total deductions	£405,939	£251,058	61.7
Balance to carry forward	£12,646	£6,258	101.9

TRAFFIC STATISTICS—BRITISH COLUMBIA ELECTRIC RAILWAY, LIMITED

	1920	1919	Per Cent Change
Passengers carried	66,411,030	53,326,288	24.5
Tons of freight carried	430,931	331,794	30.0
Freight cars interchanged with steam railroads	9,861	7,463	32.1
Light and power customers added	3,981	....	....
Kilowatt-hours of energy sold	116,196,981	94,953,424	22.4
Cu.ft. of gas sold	545,191,200	431,093,000	26.5

$466,159 Profit for Interurban

The annual report of the Utah-Idaho Central Railroad, Salt Lake City, Utah, shows a net profit of $466,159 for the year 1920. This is $199,277 less than the 1919 figure. The company operates 117 miles of road.

The report shows total operating revenue of $1,056,001 and total operating expenses of $690,815. The operating revenue was $60,871 more than received in 1919, and the operating expense was $26,259 less than it was the year before.

The total investment is $5,221,900. The total amount of stock issued was $1,426,640. The funded debt outstanding at the close of the year was $3,735,000.

During the year the road carried 1,036,727 passengers. Three passengers, twenty-five employees, and one other person were injured during the year and one employee was killed. The 371 persons employed during the year received $409,788 in wages.

Monongahela Valley Succeeds

6 Per Cent Paid on Preferred Stock and More Than $1,000,000 Put Into Property

According to the annual report of the Monongahela Valley Traction Company, the year ended Dec. 30, 1920, was considered to have been a reasonably successful one. The company formerly was engaged solely in the transportation service, but at the present time the railway revenues, amounting to approximately $2,610,000, are only 44 per cent of the total; electric power sales produce 13.4 per cent, while gas production and coal mining operations provide the balance.

Eight one-man safety cars were purchased and installed in Clarksburg, W. Va., during the year. These cars cost $50,000, or about $6,250 each.

In the latter half of 1920 the company, according to the report, did not have sufficient railway equipment to carry all of the passenger traffic offered and this demand can only be met through the purchase of additional equipment and extensions to the railway lines. In view of this situation, the company officials believe that certain rates now charged can be advanced so as to permit the company more nearly to earn a fair return on its investment and thereby enable it to market securities with which to provide capital for necessary betterments and improvements.

Sunbury Line Sold Under Foreclosure

Bondholders of the Sunbury & Susquehanna Railway, Sunbury, Pa., represented by John W. Whitaker, on April 25 bought the property at receivers sale for $55,000. This includes 6 miles of line operating between Sunbury and Selinsgrove and a mile opposite the Pennsylvania Railroad yards North of Northumberland, and known as the Sunbury, Lewisburg & Milton Railway. The property has been in the hands of receivers for eight years.

Brooklyn Earnings Improving

The Brooklyn (N. Y.) City Railroad, formerly included in the system of the Brooklyn Rapid Transit Company, recently issued a statement of income for February, 1921, compared with February, 1920. Income figures covering the period of July, 1920, to February, 1921, also were announced. The earnings reported are shown in the accompanying table.

INCOME ACCOUNT—BROOKLYN CITY RAILROAD

	Feb. 1921	Feb. 1920	July 1, 1920 to Feb. 28, 1921
Passenger revenue	$777,236	$693,780	$6,345,329
Other revenue	27,256	23,452	242,045
Total	$804,492	$717,232	$6,587,374
Operating expenses and taxes	753,459	773,585	7,039,877
Gross income	$50,033	*$56,353*	*$452,503*
Income deductions	58,573	71,560	456,491
Net corporate income	$7,540	*$127,913*	*$908,994*

NOTE:—Italics denote deficit.

Depreciation in San Francisco

Table Showing Full Depreciation Allowances for Municipal Railway and United Railroads

In the last issue of this paper a letter was published from the chief engineer of the city of San Francisco referring to the way in which the depreciation accounts for the Municipal Railway and the United Railroads of that city were treated in one of three tables published on page 697 of the issue of this paper for April 9. While the figures as printed were correct, they may have been misleading to some owing to the difference in practice of the two systems in the way of treating the depreciation account. In the report of the Municipal Railway as given out by the city and as printed in the table, the full amount allowed for depreciation, 14 per cent of the passenger revenue, appears in the operating report. In the report of the United Railroads for the year ended June 30, 1920, $550,000 was charged to the profit and loss account as a depreciation reserve in addition to the sum included in the maintenance accounts. The wording of a footnote in the table as printed may have given the impression that the latter amount was the total amount charged to depreciation.

The accompanying table is a reprint of the table in question except that the sum of $550,000 charged by the United Railroads to its depreciation reserve is now included in the operating account and the percentages and other figures are changed to fit this plan.

In connection with the above analysis of the operations of the Municipal Railways of San Francisco M. M. O'Shaughnessy, chief engineer of the city, has submitted the accompanying figures.

COMPARISON OF OPERATIONS—YEAR ENDED JUNE 30, 1920

	United Railroads of San Francisco					Municipal Railway of San Francisco				
	Actual	Per C.-M. Cents	Per C.-H.	Per Cent of Operating Revenue	Per Cent of Operating Expense	Actual	Per C.-M. Cents	Per C.-H.	Per Cent of Operating Revenue	Per Cent of Operating Expense
Passenger revenue	$8,938,987	34.85	$3.08	99.30	......	$2,702,289	36.41	3.399	99.63	.....
Revenue from other railway operations	63,124	.34	.02	0.70	......	10,147	.14	.013	.37	.....
Total operating revenue	$9,002,111	35.19	$3.100	100.0	......	$2,712,436	36.550	3.412	100.00	.....
Way and structures	423,853	1.651	$0.145	4.69	6.08	$102,130	1.374	$0.128	3.76	4.06
Equipment	548,955	2.140	.189	6.09	7.88	186,947	2.520	.235	6.90	7.44
Depreciation	(a) 550,000	2.150	.189	6.11	7.90	378,429	5.099	.476	13.98	15.08
Total maintenance	$1,522,808	5.941	$0.523	16.89	21.86	$667,506	8.993	$0.839	24.64	26.58
Power	1,357,225	5.300	.467	15.05	19.52	348,383	4.700	.438	12.86	13.87
Conducting transportation	3,471,854	13.550	1.194	38.55	49.98	1,293,309	17.420	1.628	47.65	51.40
Traffic	....	......	......	......	......	666	.009	.001	.03	.02
General and miscellaneous	695,874	2.720	0.240	7.72	10.00	202,554	2.730	.254	7.49	8.06
Add general miscellaneous comparison charge	....	......	......	......	.....	4,912	0.066	.006	0.16	0.19
Total general and miscellaneous	$695,874	2.720	$0.240	7.72	10.00	$207,466	2.796	$0.260	7.65	8.25
Credit transportation for investment	*94,463*	*0.368*	*0.032*	*1.05*	*1.36*	....	......	......	......	.....
Total operating expenses	6,953,298	27.150	$2.394	77.29	100.00	$2,517,330	33.918	3.166	92.83	100.00
Net operating revenue	2,048,813	8.040	.706	22.71	29.48	195,106	2.632	.246	7.17	7.76
Taxes	513,200	2.005	.176	5.17	7.37	226,535	3.058	.284	8.36	9.02
Net earnings	1,535,613	6.035	0.530	17.54	22.11	*31,429*	*0.426*	*$0.038*	*1.19*	*1.26*
Revenue miles	25,610,023	......	8.84	......	......	7,419,272	......	9.32	......	.....
Revenue hours	2,906,503	......	......	......	......	795,578	......	......	......	.....

(a) Allowance from profit and loss account for the year. Italics indicate deficit.
The figures shown for way and structures and equipment also include in part some allowance for current depreciation.

The company, he states, has, besides building two car houses, extended the original 45 miles of track called for in the bond issues by 18 miles, so that at present there are 63 miles of operated trackage exclusive of 4 miles in car houses, sidings, etc.

The following figures do not take into account the comparison charges that are required by the city charter. These charges are about $1,000,000.

FUNDS VOTED BY THE CITY

Bond Issues:		
Geary Street, 4½ per cent bonds, dated July 1, 1910		$1,900,000.00
Market Street, 4½ per cent bonds, dated July 1, 1910		120,000.00
Municipal 5 per cent bonds dated Dec. 1, 1913		3,500,000.00
Contribution from General Taxes:		
From city and county of San Francisco during the fiscal years 1910 to 1915 inclusive, to meet interest on funded debt	$239,901.83	
Cost of bond election Dec. 30, 1909, and referendum election April 22, 1913	29,628.54	
Provisional charges for legal and clerical services rendered by city employees	37,022.10	306,552.47
		$5,826,552.47

REVENUE RECEIVED

Total revenue received from the railway for eight years ending Dec. 31, 1920	$15,078,490.49
Operating expenditures for same period	9,561,758.63
Net earnings, exclusive of taxes and depreciation	$5,516,731.86

DISTRIBUTION OF NET EARNINGS

Interest on outstanding bonds	$1,642,322.03
Redemption of maturing bonds	899,300.00
Extensions and betterments	1,188,150.20
Depreciation	1,266,832.01
Compensation insurance	156,628.69
Materials and supplies	150,578.72
Advanced to Twin Peaks Tunnel	82,152.53
Accidents, damages, etc	130,767.68
Total	$5,516,731.86

Cleveland Traffic Decreasing

The report of the Cleveland (Ohio) Railway for March showed an ordinance surplus of $41,335, of which $28,234 was a tax refund due to a reduction in the company's valuation ordered by the state tax commission following a lengthy dispute. This ordinance surplus reduced the deficit in the company's interest fund, which is the fare barometer, from $53,425 to $12,090.

During March the company over-expended its maintenance allowance by $19,686, making the total current deficit in the maintenance, depreciation and renewal account $222,361. The over-expenditure for the month of the company in its operating allowance was $30,775, making the total current deficit in the operating account $254,638.

These two deficits have now reached such a considerable sum that company officials say they will soon have to ask City Council for some sort of an adjustment, particularly in view of the fact that the company's maintenance allowance and its operating allowance were each reduced 1 cent a car mile on April 1 under the terms of the ordinance. The need is great for caring for these deficits speedily.

During March the company carried 35,900,733 riders, a decrease in traffic of 7.04 per cent over the same month a year ago. The February traffic decrease was about 4 per cent as compared with the previous year.

Although the company officials and Fielder Sanders, street railway commissioner, took steps to curtail service in proportion to the traffic decrease they could not keep pace with the rapidly declining number of car riders, as the number of car miles run in March was 3,157,360, a decrease of only 9.41 over the same month in 1920. Further curtailments of service, however, have been made during April.

The 20 per cent wage reduction accepted by the company's trainmen, effective on May 1, will result in a saving of approximately 1 cent a car mile.

Twenty per Cent Revenue Increase with Seven-Cent Fare

The income statement of the Philadelphia (Pa.) Rapid Transit Company for the months of February and March, together with the three months' period ended March 31, is shown in the accompanying table. Since the inception of the 7-cent fare in November, 1920, the Philadelphia Rapid Transit Company has realized a 20 per cent increase in revenue with a corresponding decrease in traffic of only 4.1 per cent. In connection with the record of traffic handled it is disclosed that the number of 3-cent exchange tickets sold decreased about 10 per cent and that joint rate passengers from foreign lines increased about 28 per cent. For the five months' period ended March 31, 1920, with the 5-cent fare in effect 12,644,723 more passengers were carried than in the corresponding period with the 7-cent cash fare and the four for a quarter ticket rate.

INCOME STATEMENT PHILADELPHIA RAPID TRANSIT COMPANY

Month Ended	March 1921	March 1920	Per Cent Change	February 1921	February 1920	Per Cent Change
Operating revenue	$3,757,508	$3,179,961	18.2	$3,207,373	$2,698,457	18.8
Operation and taxes	2,765,136	2,234,354	23.8	2,442,504	2,049,795	19.2
Operating income	$992,372	$945,607	4.9	$764,869	$648,662	18.0
Non-operating income	46,637	45,109	3.4	36,996	38,900	*4.9*
Gross income	$1,039,009	$990,716	4.9	$801,865	$687,562	16.7
Fixed charges	820,823	816,476	0.5	818,297	813,585	0.6
Net income or deficit	$218,186	$174,240	25.2	*$16,432*	*$126,023*	87.0

Three months ended March 31:		1921	1920	Per Cent Change
Operating revenue		$10,583,230	$8,921,677	18.7
Operation and taxes		7,878,546	6,499,627	21.2
Operating income		$2,704,684	$2,422,050	11.7
Non-operating income		121,226	123,997	*2.2*
Gross income		$2,825,908	$2,546,047	11.0
Fixed charges		2,461,362	2,446,666	0.6
Net income		$364,546	$99,381	266.5
5% return on P. R. T. paid in capital—Three months to March 31, 1921	$375,000			
Amount by which gross revenues were insufficient to provide for operating expenses, taxes, fixed charges, and the 5% return upon P. R. T. Stock for the year ended Dec. 31, 1920	$1,117,934			
		$1,492,934		
Accumulated deficit for the fifteen-month period to March 31,1921		$1,128,387		

PASSENGER STATISTICS

March	Passengers 1921	Passengers 1920	Per Cent Change	Revenue 1921	Revenue 1920	Per Cent Change
7-cent fares	4,796,271	....	....	$335,738	....	....
6¼-cent tickets	50,658,385	....	....	3,166,149	....	....
5-cent fares	....	58,858,900	....	....	$2,942,944	....
3-cent exchange tickets	4,454,332	4,881,467	*8.8*	133,629	146,444	*8.8*
Joint rate passengers—foreign lines	728,297	667,891	9.1	29,908	21,271	40.5
Transfers	13,083,915	13,184,661	*0.8*	....	....	....
Frees	397,173	460,982	*13.8*	....	....	....
	74,118,373	78,053,901	*5.0*	$3,665,426	$3,110,660	17.8
Five months ended March 31:						
7-cent fares	27,316,031	....	....	$1,912,122	....	....
6¼-cent tickets	241,613,470	....	....	15,100,841	....	....
5-cent fares	....	281,574,224	....	....	$14,078,711	....
3-cent exchange tickets	20,968,808	23,353,740	*10.2*	629,064	700,612	*10.2*
Joint rate passengers—foreign lines	3,876,818	3,010,147	28.8	159,310	95,647	66.5
Transfers	61,952,081	62,778,117	*1.3*	....	....	....
Frees	2,101,834	2,184,412	*3.8*	....	....	....
	357,829,042	372,900,640	*4.1*	$17,801,338	$14,874,970	19.7

PASSENGER EARNINGS

	1920	1919	Per Cent Change
Ten months ended October 31	$30,522,922	$28,564,928	6.8
November	3,656,497	3,003,672	21.7
December	3,786,442	3,129,467	20.9
Total for twelve months	$37,965,861	$34,698,057	9.5
	1921	1920	
January	3,552,152	2,987,814	18.8
February	3,140,821	2,643,357	18.8
March	3,665,427	3,110,660	17.8
Five months ended March 31	$17,801,339	$13,874,970	19.7

Italics show **decrease or deficit**

Financial News Notes

New Lease Approved.—A lease of the Medway & Dedham Street Railway to the Milford & Uxbridge Street Railway, Milford, Mass., has been authorized by the directors and stockholders, and approved by the Massachusetts Department of Public Utilities.

Assessment Still Under Protest.—The County Board of Equalization at Louisville, Ky., has reduced the tentative assessment of the Louisville Railway's property from its first figure of more than $14,000,000 to $9,000,000 flat. The previous assessment was $4,000,000. The assessment of the Louisville & Interurban Railway was not changed by the State Tax Commission, but remains at the same figure, $1,750,000.

Court Orders Interest Payment.—The United States District Court recently ordered Joseph K. Choate, receiver of the Aurora, Elgin & Chicago Railroad, Aurora, Ill., to pay the coupon on the first 5 per cent bonds of that company, which was due on Oct. 15, 1920, together with interest thereon from that date.

Colorado Road Gives Up the Ghost.—The electric railway property of the Durango Railway & Realty Company, Durango, Col., is being dismantled. The company operated 2.5 miles of standard gage electric railway with five motor passenger cars. It is the first electric street railway in Colorado to give up the ghost.

Merger May Be Made Compulsory.—A bill which will permit the electric railways in Washington, D. C., to effect voluntarily the merging of their lines is being drafted in the District of Columbia committee of the House of Representatives. If prompt action does not follow the enactment of such legislation it is expected that another bill will be reported out promptly which would, in effect, compel the local companies to merge.

Capital Increased $10,000,000.—Papers have been filed with the Secretary of State of West Virginia by the Monongahela Valley Traction Company, Fairmont, certifying to an increase in its capital stock from $10,000,000 to $20,000,000. The same company in filing with the New York Stock Exchange an application to list notes a change in name of the company from the Monongahela Valley Traction Company to the Monongahela Valley Traction & Light Company. It is understood that this change was made in order to indicate more accurately the field of operation of the company, which is engaged in railway operation, electric light and power service, mining coal and kindred activities.

Approval Sought for Purchase Financing.—To carry out its plans for the purchase of the Sacramento Northern Railroad the Western Pacific Railroad has applied to the California Railroad Commission for authority to issue $4,180,000 of its first mortgage 5 per cent gold bonds. The bonds are to be exchanged for bonds of the Sacramento Northern now in the hands of a trustee. The Sacramento Northern bonds deposited for exchange amount to 90.906 per cent of the total issue. The bonds are to be exchanged on the basis of $80 face value in Western Pacific bonds for $100 face value of Sacramento Northern bonds. Of the Sacramento Northern stock issue 90.639 per cent, or $4,065,094, has been deposited with the trustee. The Western Pacific is to pay $27.50 a share for trust certificates representing first preferred stock, $15 for trust certificates representing second preferred stock and $6 for certificates representing common stock.

Traffic and Transportation

New Jersey Case Concluded

Counsel Reserves Right of Appeal—Company Must Have Compensatory Rate

Valuation of the property of the Public Service Railway, Newark, N. J., at $125,000,000 or any other figure will not be considered by the Public Utility Commission in reaching a decision on the company's application for a 10-cent fare. The Utility Board made this announcement on April 22 when the rate hearing was resumed, although it was indicated at first that the valuation figures would be injected into the fare case.

That means the case will be decided along the lines laid down by Thomas N. McCarter, president of the railway; namely, a decision as to whether the company can continue operation on its present fare, regardless of the valuation of property. It is a clear-cut case of determining whether the company's operating expenses justify a 10-cent fare.

On the day that this decision was made the municipalities that would be affected by any increase in fare began the presentation of their side. George L. Record, counsel for Jersey City, introduced as a witness Walter Jackson, Mount Vernon, N. Y. Mr. Jackson testified as to his study of various rates of fare in other large cities, the effect of increases in rates upon gross receipts and upon the riding habit as shown by the index figure. He stressed more particularly the fact that while Boston had gone to a 10-cent fare the Boston Elevated, at least, had tried to increase the usefulness of the system to the public by operating 5-cent short haul lines. He also urged that any fare change that was made should contemplate the sale of tickets at reduced rates as a wise merchandising idea and that different self-sustaining rates of fare should be considered for different traffic districts.

The hearing was resumed on April 27 with Mr. Jackson again the witness.

The Public Service Railway called in rebuttal both Edward Dana, general manager of the Boston Elevated Railway under the public trustees, and W. J. Flickinger, assistant to the president of the Connecticut Company. Mr. Dana testified that the company was getting a reasonable return with a 10-cent fare. From 5 cents the rate with that company went respectively to 7 and 8 cents, but each time, he said, the company knew that it would not be enough return and continued its fight for a 10-cent rate.

At the conclusion of the case Edmund W. Wakelee, counsel for the Public Service Railway, said:

> The Public Service Railway will ask the commission to fix such rate as it approves as a reasonable fare. The company stipulates that it will follow such a rate fixed by the board, at the same time reserving the right to test the validity of whatever rate may be fixed in the higher courts.

Present Fares Held Adequate

The Pennsylvania Public Service Commission refused to approve an increase in the rates of the Warren (Pa.) Street Railway previously established by the commission where it appeared that the applicant had always been in a financial position to pay an annual 6 per cent dividend. The new rate proposed by the company was a 7-cent cash fare, with ten tickets for 65 cents.

Reduced Fares Abolished

Reduced fares at a half-penny per mile with a minimum of a penny, which were applicable under the Tramway Act for persons defined as artisans, mechanics or daily laborers, have been abolished and uniform rates are now charged on all the city tram cars in Glasgow, Scotland. Under the order granted by the Ministry of Transport these rates will be in effect until Feb. 15, 1923, unless previously revoked by the Minister of Transport. Any further increase in fares made before that date will not affect the rates paid by workmen.

The abolition of the lower rates heretofore conceded to workmen was granted on the understanding that the corporation of Glasgow would not grant sums in relief of rates or otherwise to the common good until reasonable provision had been made for the proper repair, maintenance and renewal of the entire railway property.

Zone Fare Works Well in San Diego

Change from 5 Cents to a 10-Cent Zone System with 5-Cent Base Has Produced an Increase of 36.9 per Cent in Revenue

According to an advance copy of the annual report of the San Diego (Cal.) Electric Railway for 1920, furnished through the courtesy of E. J. Burns, "the zone system as operated in the city of San Diego has demonstrated conclusively that it is entirely reliable, free from objectionable complications and has produced very satisfactory financial results. Operations for the first nine months were reviewed in the ELECTRIC RAILWAY JOURNAL for Nov. 13, 1920.

CONTINUING, the report states significantly that:

> The zone system did not disturb real estate values; was not responsible for lowering or raising of rents; and has not changed the population insofar as being directly or indirectly responsible for any congestion in the closely built-up sections of the city, or at the boundary lines of the inner and outer zones. In fact, 90 per cent of the building activities during the year 1920 was confined within the outer zone, and this is also true of contemplated future improvements.

FARE COLLECTION POPULAR AND FASTER THAN BEFORE

It should be understood that the San Diego system is not of the multi-fare collection type, but a true zone system in which but one collection is made for the entire trip. It has been found that the pay-leave plan for outbound traffic and the pay-enter plan for inbound traffic actually has speeded up collection and therefore permitted fewer cars to handle the peak-load traffic than was the case under the old method of operating pay-enter always, especially on cars with limited loading space. The pay-leave plan outbound is pleasing to the public inasmuch as it is not necessary to shift parcels or packages on boarding cars for the purpose of paying fares. As to pay-enter inbound, the only change due to the zone system was the issuing of identification checks which has worked out with no inconvenience or complications.

MORE REVENUE AND MORE RIDERS

The financial success of the zone system is indicated by the operating figures for the year 1920. The revenue received from the transportation of 20,909,587 cash fare and revenue ticket passengers under the zone system amounted to $1,330,275 as compared with an amount of $1,026,445, representing the revenue that would have

TABLE I—CASH FARE AND REVENUE TICKETS, SAN DIEGO ELECTRIC RAILWAY, YEAR ENDED DEC. 31, 1920
(Includes suburban lines)

Passengers Carried	Cash Fare and Revenue Tickets	Rate	Amount
5c. cash fares	7,973,635	5c.	$398,682
10c. cash fares	695,375	10c.	69,538
15c. cash fares	17,696	15c.	2,654
20c. cash fares	9.887	20c.	1,977
25c. cash fares	6,019	25c.	1,505
Total cash fares	8,702,612		$ 474,356
Revenue tickets:			
Four-strip, two-zone ticket	8,139,734	7.5c.	$610,480
$4.00 calendar month book	484,127	7.2c.	37,766
Sixten varieties of school and suburban line tickets	3,583,114	1.66c. to 20c.	$207,673
	12,206,975		$855,919
Grand total	20,909,587		$1,026,445

been received from the same number of passengers based on the rates of fare that existed prior to Jan. 1, 1920, an increase of 29.6 per cent.

The revenue received per passenger under the zone system averaged 6.36 cents, as compared with an average of 4.91 cents based on rates of fare in effect prior to Jan. 1, 1920, making the average revenue per passenger increase 1.45 cents or 29.53 per cent. Table I, in the company's opinion, indicates that the California Railroad Commission was justified when it stated: "The adoption of the zone system is much more likely to secure to the company the necessary additional revenue than a flat increase," stating for its reason that "a large amount of short-haul business would be lost to the company under a flat increase."

Table II further backs up the foresight of the commission, for therein it is shown that the 5-cent fares or short-haul passengers consisted of 38.44 per cent of the total revenue passengers, and that they produced 30.21 per cent of the passenger revenue. Table II also shows that 50.18 per cent of the total passengers were carried on a fare of 1⅔ cents to 5 cents, an average of 4.62 cents per passenger, and that this class of fare produced 36.48 per cent of the revenue. Fares more than 5 cents consisted of 49.82 per cent of the passengers carried, and yielded 63.52 per cent of the total revenue, an average of 8.11 cents per passenger. The total number of revenue passengers carried in 1920 was 20,909,587 compared with 20,538,530 revenue passengers in 1919—an actual increase of 1.8 per cent despite the combination of higher fares and declining activity. Indeed, it is interesting to point out that the figures for 1919 compared unfavorably with 1918 when the average fare was about the same but when war camps had stimulated the traffic to a total of 21,517,796 revenue riders.

Further, a comparison of 1920 with 1919 shows that transfer passengers increased from 3,398,150 to 3,769,981 or nearly 10 per cent, proving that no privileges in that direction were withdrawn by the zone fare. The increase in revenue was from $971,174.04 to $1,330,275.54, an increase of 36.9 per cent. The number of car-miles increased in lesser ratio than the traffic (from 3,572,836 car-miles to 3,583,758 car-miles) as shown by the fact that the cash fare and revenue ticket passengers per car-mile increased from 5.76 to 5.83 and the revenue and transfer passengers combined from 6.70 to 6.89. The revenue per car-mile rose from 27.18 cents to 37.11 cents or 36.5 per cent.

MORE REVENUE PER CAPITA TO OFFSET PRIVATE AUTOMOBILES

It appears from the report that the banner riding year of San Diego was 1913 when a population of 67,700 was carried 27,156,415 times (including transfer rides) yielding a revenue of $1,001,314, a riding index of 401.13 rides per inhabitant per annum and an average annual revenue of $14.79 per inhabitant. During the following years there has been a steady decline in the car-riding index, due permanently to the great increase in private automobiles and temporarily to the jitneys which flourished for two or three years. The zone system compared with the 5-cent year (1919) immediately preceding has had at least the satisfactory result of preventing any perceptible decline in riding due to increased fares, while raising the average annual revenue per inhabitant to a higher figure, $12.09, than it had been since the period 1914-1919. This is clearly brought out in Table III.

SALES COMMISSION TO PLATFORM MEN EQUALS 7.17 PER CENT BONUS ON WAGES

A second reference to Table II shows that fare collection on the San Diego zone system is facilitated by the great proportion of convenient cash and ticket fares. Thus of the total, 38.44 per cent were 5 cents cash and 38.93 per cent were 7½-cent ticket, the latter being good for the same two-zone and inter-zone transfer ride as 10 cents cash. The high percentage of these "four for 30 cents" tickets is due to their being sold by the conductors on a basis of 3 per cent commission which is divided among all platform men in proportion to the number of platform hours worked by each man. The sales commissions distributed during 1920 as separate checks amounted to $22,220 or 3.167 cents per platform hour. This represents a bonus of 7.17 per cent over the regular average wage of 44.128 cents an hour. It may be of interest to add that certain duties, such as turning trolley poles, seats, dash signs and tail lights are now expected of the motorman, as the conductor, under the zone system, has some extra clerical duties.

ZONE FARE RESULTS EXCEED COMMISSION ESTIMATES

The engineers of the California Railroad Commission estimated that the financial results for the twelve months following the adoption of the zone system would provide approximately $110,000 for fixed charges. As a matter of fact, the amount available for fixed charges was $219,635 or about 100 per cent more than estimated. However, it should not be expected that the zone system of fares will have any control over expenditures made for maintenance, operation, depreciation, taxes, etc. It is a system of fares affecting revenue only; and, as will appear when the full financial figures come to hand, the company must be relieved of certain burdens, particularly paving, before it can show a better return than 3.34 per cent on the investment.

TABLE II—CLASSIFICATION OF CASH AND REVENUE TICKET PASSENGERS, SAN DIEGO ELECTRIC RAILWAY, YEAR ENDED DEC. 31, 1920

Rate of Fare	Passengers Carried Number	Passengers Carried Per Cent	Revenue Collected Amount	Revenue Collected Per Cent
1⅔c. to 2½c.	763,005	3.65	$19,909	1.50
3¾c.	1,691,060	8.09	63,414	4.77
5c.	8,037,525	38.44	401,877	30.21
6¼c. to 6⅔c.	647,297	3.09	45,972	3.44
7½c.	8,140,449	38.93	610,533	45.90
10c.	985,892	4.71	98,591	7.41
12½c. to 15c.	518,358	2.48	66,372	4.99
17½c. to 25c.	126,001	0.61	23,607	1.78
Total	20,909,587	100.00	$1,330,275	100.00

TABLE III—SHOWING POPULATION SERVED, REVENUE PASSENGERS CARRIED, REVENUE RECEIVED FROM PASSENGER TRANSPORTATION AND AVERAGE RIDES AND REVENUE PER CAPITA PER ANNUM, SAN DIEGO ELECTRIC RAILWAY

Year	Population Served	Revenue and Transfer Passengers	Passenger Revenue	Average Rides per Capita per Year	Average Revenue per Capita per Year
1913	67,700	27,156,415	$1,001,314	401.13	$14.79
1914	75,800	23,595,012	930,089	337.67	12.27
1915	80,600	27,587,239	992,552	342.27	12.31
1916	86,700	24,525,162	932,003	282.87	10.75
1917	90,000	21,973,154	892,166	244.15	9.91
1918	100,000	24,660,128	1,030,745	246.60	10.31
1919	105,000	23,936,680	1,021,362	227.96	9.73
1920	110,000	24,679,568	1,330,275	224.36	12.09

Jitney Regulation Proposed in Birmingham

Regulation of Jitneys operating in Birmingham, Ala., is up before the City Commission and it is probable that some form of ordinance requiring liability insurance will be adopted. City Attorney Fred G. Moore is now working out an ordinance to be presented to the commission for action. Regulations adopted by a number of other cities and suggestions by local citizens and civic organizations are being studied before final drafts of the ordinance are prepared.

At a recent meeting of the commission an ordinance was introduced by Commissioner H. P. Burruss providing for regulation of the jitneys. The ordinance was in form of a suggeston to the commission and Mr. Burruss asked that it be referred to the City Attorney to form the framework for an ordinance to be adopted.

Liability insurance in the sum of $5,000 in the case of an accident resulting in the injury or death of one person and of $10,000 in the case of the injury or death of any number of persons was provided in this ordinance. It also provided for the protection of jitney passengers as well as a pedestrian and other vehicles.

Vigorous protests against the adoption of the ordinance or any similar ordinance were made by a number of jitney operators. They maintained that the insurance would be prohibitive, though it was provided in the original ordinance that any number of cars operated by a single owner could be protected under a single policy.

The proposal to regulate the jitneys and require insurance has been endorsed by a number of the local civic organizations. It is probable that the final ordinance will provide for insurance protecting pedestrians and other traffic but not jitney passengers.

Ignorance of Hassenpfeffer Kills Ordinance

After more than an hour of debate at the last meeting of the City Council of Toledo, Ohio, an ordinance proposed by Commissioner Wilfred E. Cann barring dogs—except crated or lap dogs—from city street cars was laughed down and defeated.

Regular fares have been charged for dogs but recently a conductor was bitten by an unruly dog and complaint was made against all of the canine family.

Councilman Dominick Foy proposed an amendment which would permit dogs muzzled and leashed to be carried during the hunting season. Another councilman went to bat for dog fanciers and championed the Airedale, of which Toledo family President Harding's "Laddie Boy" is one of the most famous. Another member challenged the statement that the Airedale was a "hunting dog" or a "one-man dog."

When an assistant law director drafted the amendment permitting dogs to ride for full fare during the "hunting season" he made plain that he didn't know what hunting season was meant—hassenpfeffer, squirrel, muskrat or anything else.

The amendment carried, however, and then the whole question was voted down and dogs will continue to enjoy street car rides as regular 6-cent passengers.

Sustains Ten-Cent Fare

Supreme Court Justice MacCrate in Brooklyn on May 2 denied the application of the city for an injunction restraining Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, Brooklyn, N. Y., from continuing to charge a double fare on the Broadway, Reid Avenue, Wilson Avenue, Franklin Avenue and Smith Street car line. The court said:

> The determination of the Public Service Commission, after hearings, is that these lines are now unprofitable. An injunction may mean their discontinuance. It seems to me better that the public should be transported than that they should be forced to walk.

The 10-cent fare was permitted on these lines on March 12. The city claimed it was illegal. The Brooklyn Rapid Transit contended that one fare could be charged for a ride within the old city limits and another for the continuance of a ride to outlying districts.

Transportation News Notes

Fares Declared Lawful.—The Interstate Commerce Commission held on April 26 that the one-way round-trip and commutation fares between stations on the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., were not unreasonable or otherwise unlawful. The complaint was made by the commuters' club.

Advertising Campaign in Dallas.—The Dallas (Tex.) Railway is conducting a publicity campaign at this time with the object of improving service and eliminating any dissatisfaction among patrons of the company. The campaign is under the direction of Dan Fisher, assistant to President J. F. Strickland. Extensive newspaper advertising is being employed, in addition to personal work among the trainmen and large display posters in the cars.

Higher Fares Asked in Helena.—The Helena Light & Railway Company, Helena, Mont., recently petitioned the Railroad & Public Service Commission for a 10-cent fare in the city of Helena and 15 cents in East Helena. The company also asks permission to sell commutation tickets at the rate of forty for $2, to be used within city limits. The present rate of 7 cents with 6¼ cents where tickets are used went into effect on July 1. The company in its petition declares that this award of the commission was not sufficient to net the railway a reasonable return.

Motormen and Conductors Praised.—W. H. Sawyer, president of the Alton, Granite & St. Louis Traction Company, Alton, Ill., in a letter to the superintendent of transportation and roadway, has complimented the motormen and conductors for their co-operation in the safety work which has been under way for some time. Statistics were prepared and definite figures show that real results are being produced. Comparing the year 1917 with 1920 the total number of accidents has been reduced approximately 23 per cent despite the fact that accidents due purely to automobiles have increased 50 per cent.

Action on Fargo Fare Expected.—The North Dakota Railroad Commission recently arranged to take final action on the question of rates charged by the Northern States Power Company, Fargo, N. D., on its railway. The present 7-cent rate now in force in Fargo, village of North Fargo, N. D., and Moorhead, Minn., became effective last June when the commission ruled that the new rate was temporary pending final determination of the company's property valuation. The justification for continuing the 7-cent rate will depend upon the railway's income and expense accounts which will be reviewed in detail at the coming hearing.

Interurban Rate Increased.—The Public Service Commission has authorized the Interstate Public Service Company, the Indianapolis & Louisville Traction Company, the Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Lighting Company to increase their passenger fare rates basis from 2¾ to 3 cents a mile. These companies all operate a continuous line between Indianapolis and Louisville and their petition said that all other electric traction companies in the State are receiving 3 cents a mile for passenger service and that railroads were receiving 3.6 cents a mile.

Suburban Line Increases Fare.—Under an order issued by the Public Utilities Commission the Northern Ohio Traction & Light Company, Akron, Ohio, began the collection of a 20-cent fare between New Philadelphia and Uhrichsville on March 7. The former rate was 10 cents. The change in fare follows an application filed by the company six weeks ago. The county grant expired at that time and March 7 the city grant at Uhrichsville expired. Negotiations have been going on for some time looking toward a new franchise, but so far no agreement has been reached. Patrons of the line paid the fare without complaint. Recently the company has been conducting an advertising campaign along the line showing the cost of carrying passengers. These figures indicated that a 20-cent fare was necessary. The distance is ten miles.

Suburban Line to Increase Fare.—J. F. Strickland, president of the Texas Electric Railway and also president of the Dallas (Tex.) Railway, announces that fare on the Trinity Heights line, which consists of suburban service through the Trinity Heights addition to the city of Dallas operated over the lines of the Texas Electric Railway, will be increased. The present fare to Trinity Heights is 5 cents, the rate not having been increased when the fares in the city of Dallas were raised to 6 cents. Although the Trinity Heights service is operated over the lines of the Texas Electric Railway the Trinity Heights cars traverse the tracks of the Dallas Railway down town and across the Trinity River bottoms to Oak Cliff, where they leave the rails of the Dallas Railway for the Texas Electric Railway. The contract under which the service to Trinity Heights was established about two years ago has expired and a new contract must be negotiated with the Dallas Railway for the use of its tracks, and Burr Martin, vice-president and general manager of the Texas Electric Company, and Richard Meriwether, vice-president and general manager of the Dallas Railway, are now negotiating for a new contract. The fare increase will be started at the time the new contract goes into effect.

Personal Mention

Noted Engineer President

W. S. Lee, Formerly Vice-President, Has Been Chosen to Head Piedmont & Northern Railway

William S. Lee, Charlotte, N. C., has been elected president of the Piedmont & Northern Railway by the directors of that property. Mr. Lee, for some time vice-president, succeeds the late Z. V. Taylor.

Mr. Lee is vice-president and chief engineer of the Southern Power Company, Charlotte, N. C., a position he has held since 1905 when the company took over other power companies and purchased larger power rights. In this capacity, with the financial assistance of J. B. Duke as president of the organization, he has designed and constructed eight hydro-electric plants and four steam stations with an aggregate capacity of 280,000 kva.

W. S. LEE

It is rather interesting to note that Mr. Lee's first practical experience was as resident engineer with a small street railway in South Carolina, which later he left to take up work dealing with power generation. Now one most naturally associates his name with water-power development and electrification of industries in the South, where his leadership and engineering ability have accomplished marvels.

Under Mr. Lee's direction, the Piedmont & Northern Railway has been built up since 1911 so that now it is a system operating 130 miles of track. A high-speed interurban service is furnished, operated at 1,500 volts direct current from the Southern Power Company's system.

The standards devised by Mr. Lee through experience in pioneer design and installation of power transmission equipment have been widely reflected in the practices of other large companies.

About a year ago Mr. Lee established a consulting engineering office in New York. He already had an engineering staff in Charlotte which now works in conjunction with the New York office.

Mr. Lee was born in Lancaster, S. C., on Jan. 28, 1872, and was graduated from the South Carolina Military Academy in 1894. His early experience was with the Anderson Water, Light & Power Company, Anderson, S. C., where he was engineer in charge of the construction of the Portman Shoals hydro-electric plant. There he placed in service in 1898 the first 11,000-volt generator to be installed in America. His record also includes association with other power companies. Many of these companies have since been taken over by the Southern Power Company.

R. W. Meade Resigns as President of Detroit Motorbus Company

Richard W. Meade has resigned as president and general manager of the Detroit (Mich.) Motorbus Company. He formerly was president and general manager of the Fifth Avenue Coach Company, New York. Mr. Meade has been responsible for providing in Detroit urgently needed motor transportation facilities by supplying a service similar to that which has proved so useful and popular in New York. The present scope of the system and the results of seven months' operation formed the basis of an article in the issue of the ELECTRIC RAILWAY JOURNAL for April 23.

Mr. Meade has made no definite plan for the future as yet, but he expects to remain in the bus business, in which he sees a great future. He will not, for the present at least, resume his connection with the Fifth Avenue Coach Company.

Mr. Meade was formerly a street railway man, at one time having been connected with the Metropolitan Street Railway, New York, now the New York Railways, as assistant to the president. His previous experience also includes long service in steam railroading.

H. M. Addinsell, Chairman of P. S. Securities Committee

H. M. Addinsell, of Harris, Forbes & Company, has been appointed chairman of the Public Service Securities Committee of the Investment Bankers' Association of America. Mr. Addinsell, whose appointment was announced by Roy C. Osgood, president of the association, succeeds O. B. Willcox, who recently resigned from the board of governors. Pierrepont V. Davis, of the National City Company, was appointed chairman of the Railroad Securities Committee.

Steam Road Man Chosen

F. H. Wilson of N. Y. C. Elected President of Cleveland, Southwestern & Columbus Railway

Frank H. Wilson, for thirty-three years connected with the New York Central and Big Four Railroads, was elected on April 26 to fill the position of president and general manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio. He will fill the vacancy created at the first of the year by the resignation as president of F. E. Myers of Ashland, Ohio, to become chairman of the directorate.

Mr. Wilson becomes general manager of the Cleveland, Southwestern & Columbus Railway as well as the president because of the continued ill health of E. F. Schneider, general manager. Because of the condition of his health Mr. Schneider was given a three months' leave of absence, which is about to expire. Mr. Schneider says he believes he can resume some sort of work, while the officers of the company feel that it will be necessary for Mr. Wilson to act as general manager, although Mr. Schneider will be retained in some sort of a capacity.

F. H. WILSON

Mr. Wilson is a steam road man who came up from the ranks. He began his railroad career in Indianapolis as a messenger boy for the Indiana, Bloomington & Western Railway in 1887. He spent the next sixteen years climbing from one position to another in the service of the Big Four.

Ten years ago he went to the New York Central lines as assistant general superintendent of the Lake Shore and Michigan Southern Railway, and four years ago was promoted to the position of general superintendent of the Cleveland district, embracing New York Central territory from Buffalo to Toledo and south. When Mr. Myers resigned Jan. 1 the directors appointed a committee to hunt for a man to take his place and on the recommendation of the committee the election was made.

Otto Miller, of Hayden, Miller & Company, was elected a member of the board and made chairman of its executive committee.

President Devlin Leaves California Commission

President Frank R. Devlin of the California State Railroad Commission on April 26 resigned his position on account of his desire to return to general practice of law, in which he had been previously engaged for eighteen years. Mr. Devlin formerly was district attorney of Solano County, Cal., where he had also served as superior judge. He was a member of the 1911 California State Legislature. Mr. Devlin succeeded E. O. Edgerton as president of the commission when the latter's term expired recently. Chester H. Rowell replaced Mr. Edgerton on the Commission.

H. Stanley Benedict of Los Angeles, an attorney and former member of the State Legislature, and an active member of the State Board of Control with offices in Los Angeles and Sacramento, has been appointed to membership on the State Railroad Commission as a successor to Mr. Devlin. Mr. Benedict has been a resident of Los Angeles for 35 years and has been prominently connected with state projects, offices and politics.

Successful Mediator on California Commission Resigns

After opening and for eight years managing the Los Angeles office of the California State Railroad Commission, Miss Janet Converse on April 26 tendered her resignation to the Railroad Commission in San Francisco. That credit for the highly successful work of the commission in southern California is due Miss Converse was the finding of a committee which recently made a survey of that commission. She is now resigning to engage in business for herself in the field of industrial surveys and public relations.

In the eight years Miss Converse has been in charge of the Railroad Commission's work in southern California, she has adjusted more than four thousand informal complaints without a court hearing before the commissioners. Her policy of inviting parties to a dispute over public service to come to her office and there discuss the subject freely and openly has done much to promote proper understanding between utilities and regulatory bodies and the public. Such conferences have brought executives of the utilities in direct touch with complainants.

Absence of a standard of service for street railways and other public utilities in many communities shows an important work which can benefit both the public and the public utility companies, according to Miss Converse and it is to this subject she will devote her energies. Each man in a city has a different idea of the service the street railway should render and a different complaint to be made to regulatory bodies. This situation presents many difficulties and can be met best by some organization or agency acting independently in a survey of conditions in communities where no standard exists.

Miss Converse was well experienced in organization work when she became secretary of the Southern California Railroad Commission, having had the honor of directing the first woman's political campaign in Los Angeles.

Mr. Mathews Leaves B. R. T.

Superintendent of Surface Roadway in Brooklyn Takes Like Position with Third Avenue Railway

E. L. Mathews has resigned as superintendent of surface roadway of the Brooklyn (N. Y.) Rapid Transit Company to take up similar duties in the maintenance organization of the Third Avenue Railway, New York.

Before going to Brooklyn in 1908 Mr. Mathews served some ten years as superintendent of construction for contracting and engineering firms in Baltimore, Md., and was in charge of the rebuilding of a number of street railway lines in that city. Later he was superintendent of construction during the building of the Philadelphia & Western Railway, Norristown, Pa. In 1907 he made an extensive physical examination of the street railways in San Francisco for the firm of Newhall & Company, just prior to the merger of a number of properties there.

In 1908 Mr. Mathews organized the track department of the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., and later became engineer of way and structure for that company, holding this position until the merger with the Brooklyn Rapid Transit System. Entering the way and structure department of the latter company as assistant engineer in charge of maintenance in 1915 he ultimately took over the active field direction of the surface maintenance with the title of superintendent of surface roadway.

State's Directors of Providence Railway Appointed

Governor San Souci of Rhode Island on April 20 sent to the Senate the appointments of Zenas W. Bliss, of Cranston, and George H. Newhall, of Providence, as directors of the United Electric Railways, Providence, R. I.

Mr. Bliss, who is chairman of the State Tax Commission, is now president of the temporary organization of the trolley corporation. Mr. Newhall, state bank commissioner, is the present treasurer of the temporary company.

These appointments are made by the Governor under the act incoroporating the United Electric Railways, passed by the legislature two years ago which provides that there shall be two members of the board of directors representing the state.

C. E. Hart has been named chairman of the Findlay (Ohio) Street Railway Commission which took charge of the operation of the cars under a cost-plus form of franchise recently approved for that city. Eight-cent fares are in effect, but the commission warned citizens to support the lines or an advance to 9 cents would become effective in three months.

J. H. Libbey, who recently resigned as engineer of power and electric lines of the Eastern Massachusetts Street Railway Company, has become connected with H. M. Haven and William W. Crosby, engineers and architects, Boston, Mass.

Obituary

H. S. Graham

Howard S. Graham, president of the Washington-Virginia Railway, Washington, D. C., died on April 10. Mr. Graham was very active in public utility work and was also a banker and broker of great energy and enterprise. He was probably best known as senior member of the banking and brokerage firm of Graham, Parsons & Company, with offices in both Philadelphia and New York. He had been actively engaged in this line of business for many years and his equitable business policies and integrity of purpose had secured for him a warm and sincere friendship in the various walks of life.

Hardin H. Littell

Hardin H. Littell, seventy-one years old, formerly general manager of the Louisville (Ky.) Railway, died suddenly on April 28 at his home in Buffalo, N. Y., where he had been president and general manager of the Buffalo Railway. He was one of the organizers and the first president of the American Electric Railway Association and was recognized as one of the most capable railway men of America.

Entering the service of the Louisville Railway when 17 years old, Mr. Littell rose rapidly through merit of his ability. He resigned in 1891 to become head of the Buffalo car system.

Born in Corydon, Ind., Mr. Littell attended the country schools of Harrison County until 12 years old. He began his business career as a clerk in a drygoods store, later going with a jewelry store.

In 1864 Mr. Littell became office boy in the office of the late Gen. J. T. Boyle, who first successfully organized a street car system in Louisville. At the age of 22 Mr. Littell was made superintendent. After leaving Louisville Mr. Littell served as president of the Buffalo, Bellevue & Lancaster Railway and president of the Cincinnati (Ohio) Inclined Plane Railway.

He was one of the largest stockholders in the Louisville Railway Company and served as a director until the management was changed a year ago. He retired from business some years ago following the sale of the Buffalo Railway to the International Traction Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Spring Buying of Rail Bonds for Maintenance

Large Producer Reports Demand Ahead of Last Year; Others Find Less Activity

Although one of the largest rail bond manufacturers reports a demand that on the whole is normal and perhaps even a little heavier than last year, other producers do not find the market especially active this spring. One factor in the buying that is noted by all interests is that electric railways are not stocking rail bonds heavily and are ordering almost entirely for maintenance work rather than on behalf of new track construction.

Whereas most producers, however, state that maintenance buying is down to the lowest possible minimum, the exception heretofore noted reports that, inasmuch as repairs to bonds and other track equipment have been neglected so much in the past, there is a large amount of work that absolutely has to be done this year. Rail bond business so far as coal mines are concerned is far below normal, for with the present slack operating conditions in the soft coal industry buying from that source is light.

Stocks of the finished product are not uniform. Some producers have good stocks on hand and can make immediate shipments, but several others do not follow a policy of stocking as a general rule and hence are quoting deliveries of one to three weeks. Production is curtailed at present, though at least one of the leading manufacturers is proceeding to build up a sizable stock. This action may possibly be influenced by the steadiness of copper prices which have shown some tendency to firm slightly.

Rail bond prices have not changed since the first of last December, when an increase of 5 points in the discount, following several previous recessions from the peak price, brought the quoted discount to its present level of 25 per cent. The opinion is generally expressed that prices have reached bottom in view of the position of the copper market.

Steel Corporation Announces Wage Reduction

The United States Steel Corporation, through Judge E. H. Gary, on May 3 announced a wage reduction of 20 per cent, effective May 16, in the pay of day laborers at the manufacturing plants. Since the reduction in price of steel by the corporation a few weeks ago, the question of a wage reduction has been thought by the trade to be merely a matter of weeks. Announcement is also made of a reduction in the hours of production per day. In some departments the twelve-hour day has been abandoned and efforts are being put forth to extend this to all departments before the year is out. Other mills have experimented with the 8-hour day innovation with satisfactory results.

Trolley Wire Production at 50 per Cent of Capacity

Though Present Buying Is Only for Maintenance, Producers Are Hopeful of Improved Demand Soon

Conditions in the market for trolley wire are apparently uniform with virtually all producers. The general practice is to cut overhead to a minimum and wait for business to open up. Accordingly operation in most cases is at only 50 per cent of capacity, this curtailment being accomplished by operating but three days a week in some cases and by reducing labor forces in others.

Despite this reduced output stocks of trolley wire with those producers who normally carry a surplus supply, are in ample shape to make immediate shipment on such orders as are coming in. Many producers, especially of plain copper trolley wire, do not usually stock their product, and in these instances orders can be filled in about one week.

Buying is only for repairs and light at that. Producers report that electric railways are not stocking trolley wire to any extent, in fact, because of the delivery situation this is not necessary, and as there are few if any new extensions under way, orders cover only essential maintenance needs and nothing more. There is general optimism expressed by wire manufacturers, however, that an improvement in business in this line is not too far distant. Although the spring is normally the buying season for trolley wire there is a general view that starting with the summer better buying will be felt. The basis for this optimism is largely the good potential market and the possibility of relief from the pressing question of labor readjustments in the industry.

Prices of trolley wire have held steady for quite some time and in view of the low position of copper with its slight tendency to firm in price recently, it seems questionable if quotations can go much, if any, lower. Producers are generally quoting on a 15-cent base though one manufacturer whose product is not all copper is on a 14½ cent base.

Manufacturers Have Low Stocks of Turnstiles

Railways Have Not Entered Market, but Good Demand from Amusement Parks Has Reduced Supply

Prices of turnstiles are still virtually at the peak level of last year, producers report. The chief item in the cost of manufacture is labor, and labor costs in this field, it is stated, are no lower except as greater efficiency of workmen serves to reduce expenses. The price element is not thought to be an important factor in the light buying of turnstiles this spring, however, as there is said to be little likelihood of any decrease in price being made this year.

The main factor in the market is the fact that electric railways have not the money to make new extensions such as building stations and terminals where turnstiles would be used. There is some buying of repair parts of course but as there is never much call for replacements of the finished product the market this spring falls far below that of other years. On the other hand, a good demand has resulted from privately-owned amusement parks and this has either cleared out manufacturers' stocks or reduced them to very low levels.

The general policy now is not to stock turnstiles. Consequently, some producers are turning out this product only on order while others could produce twice as many machines as at present, if it were necessary. Deliveries are not from stock, for the good reserve supply that was built up during the past winter has been exhausted, but at the same time shipments can be made promptly. Inasmuch as turnstiles are largely a seasonable spring product, there does not seem much prospect that the market will open up very much later this year.

Toronto Places $1,270,000 Order for New Cars

The Toronto Transportation Commission, which will have jurisdiction over the operation of the Toronto Railway system when the franchise expires next September, at a meeting on April 26 awarded a contract to the Canada Car & Foundry Company, Montreal, for 100 motor and 60 trailer cars amounting to about $1,270,000, exclusive of the electrical and air-brake equipment. It is expected the latter equipment will be purchased either from Canadian or British firms or possibly both. Bids on the car bodies were received from several car manufacturers in the United States, but when exchange rates were taken into consideration the bids submitted were not considered favorably.

The cars will have all-steel bodies. The motor cars will be 51 ft. 8 in. long and 8 ft. 6 in. wide while the trailers will be 49 ft. long and the same width as the motor cars. The seating capacity of the motors will be 57 passengers and the trailers will seat 61. General Manager H. H. Couzens states that a substantial number of the cars will be delivered by the first of next September.

The seats will be of wooden slats; windows of plate-glass and the lower panels in the doors of wired glass. The price for both types is considerably below the original figures received by the Commission. The first estimates were about $27,000, and it is expected that the cars will be placed in service next fall at a final cost of between $17,000 and $18,000 each. Though the contract has been awarded, the Transportation Commission, to comply with the law, must submit the specifications and design for the approval of the Ontario Railway and Municipal Board. This will be done immediately.

Electrification Planned in Jamaica

A $10,000,000 project for the electrification of the Government Railway is planned by the Jamaican Government, according to the *Times Trade Supplement*, London. Of this amount it is said the pipe and conduit lines will cost about $2,000,000, on which a 5 per cent saving can be effected by buying from the United States. Seven substations at a cost of $800,000 are suggested, while trolley wire, feeders, transmission and communication lines will total $4,000,000. Twenty-one electric locomotives are estimated at $1,250,000.

Stock Deliveries of Metal Culverts

Railway Buying Small Compared with Highway Demand—Prices Drop 35 to 40 per Cent This Year

Demand for metal culverts with both steam and electric railways does not shape up very large in comparison with the general culvert business, producers report. Some inquiries are received and a few orders are being placed, and though even this spring the railway demand is probably better than has been the case for the past few years, it is by no means up to the old standard of before the war. Culvert manufacturers apparently believe that a large potential market exists in the railway field, however, as some of them are doing considerable circularizing and advertising there.

At the beginning of this year the culvert business looked good in view of prevailing lower prices, better railroad facilities, improved operating conditions and quicker deliveries. Since then there seems to have been a general slowing down of buying, though the demand from highways still causes total sales to hold up to about normal volume if we eliminate from consideration the abnormal demand of last year. Producers are quite generally optimistic that the present year on the whole will yield good results. Extensive road building programs are under way throughout the country, though the work is temporarily set back awaiting a new congressional appropriation for Federal aid in road building.

Little possibility is seen that deliveries will be in anywise pushed for long to come. Stocks of finished culverts are being kept up well so that immediate shipments can be quoted on standard material at present, while sheet mills are keen for business and compete with each other in giving culvert manufacturers prompt shipments. There is likewise considerable competition among culvert producers for large orders, even for those which yield only a small margin so that plants may be kept running at the present normal rate of operation.

Prices in this market are decreasing in an orderly way commensurate with the drop in material costs. A representative producer who increased prices from 15 to 25 per cent during 1920 has lowered quotations from 35 to 40 per cent thus far this year. In general culvert prices are on a very reasonable basis compared with pre-war prices.

Rolling Stock

The United Railways and Electric Company of Baltimore, Md., on April 25 placed an order with the J. G. Brill Company for ten safety cars.

Municipal Railway of San Francisco, Cal., is making final arrangements to purchase thirty light-weight, single-truck, center-entrance street cars. They will be 29 ft. long, will weight 13 tons, and will be equipped with two 50-hp. motors.

Worcester (Mass.) Consolidated Street Railway Company is equipping twenty of its regular double-truck cars for one-man operation. The cars, which are being refitted in the company's own shops, will not be equipped with standard safety devices. A manual door controlling handle and an original safety device for passengers to release the car doors by pulling a lever if necessary, are being installed.

NEW YORK METAL MARKET PRICES

	Mar. 30, 1921	May 4, 1921
Copper ingots, cents per lb	12.75	12.62½
Copper wire base, cents per lb	15.00	14.50
Lead, cents per lb	4.10	4.75
Nickel, cents per lb	41.00	41.00
Zinc, cents per lb	5.15	5.45
Tin, cents per lb	29.37	31.87½
Aluminum, 98 to 99 per cent, cents per lb	28.00	28.00

OLD METAL PRICES—NEW YORK

	Mar. 30, 1921	May 4, 1921
Heavy copper, cents per lb	9.50 to 10.25	10.00 to 10.50
Light copper, cents per lb	7.00 to 8.50	7.50 to 8.00
Heavy brass, cents per lb	5.50 to 5.75	5.50 to 5.75
Zinc, old scrap, cents per lb	2.87 to 3.00	2.87 to 3.00
Yellow brass, cents per lb	4.00 to 4.25	3.75 to 4.00
Lead, heavy, cents per lb	3.25 to 3.50	3.75 to 3.90
Steel car axles, Chicago, per net ton	14.50 to 15.00	14.00 to 14.50
Old car wheels, Chicago, per gross ton	13.50 to 14.00	13.50 to 14.00
Steel rails (short) Chicago, per gross ton	12.00 to 12.50	13.00 to 13.50
Steel rails (rerolling), Chicago, gross ton	12.00 to 12.50	12.50 to 13.00
Machine shop turnings, Chicago, net ton	5.50 to 6.00	5.00 to 5.50

ELECTRIC RAILWAY MATERIAL PRICES

	Mar. 30, 1921	May. 4, 1921
Rubber-covered wire base, New York, cents per lb	16.50	16.00
Weatherproof wire base, New York, cents per lb	17.50	15.50
Standard Bessemer Steel Rails, per gross ton	45.00	45.00
Standard open hearth rails, per gross ton	47.00	47.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	.....	.....
Rails, girder (grooved), per gross ton, f.o.b. mill	.....	.....
Wire nails, Pittsburgh, cents per lb	3.00 to 3.25	3.25
Railroad spikes, drive, Pittsburgh base, cents per lb	3.65	3.40
Tie plates (flat type), cents per lb	2.75	2.75
Tie plates (brace type), cents per lb	2.75	2.75
Tie rods, Pittsburgh base, cents per lb	6.00	6.00
Fish plates, cents per lb	2.75	2.75
Angle bars, cents per lb	2.75	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb	5.00	4.50
Steel bars, Pittsburgh, cents per lb	2.00 to 2.35	2.10
Sheet iron, black (24 gage), Pittsburgh, cents per lb	3.70 to 4.20	3.85
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	4.55 to 5.25	4.55
Galvanized barbed wire, Pittsburgh, cents per lb	3.85 to 4.10	4.10

	Mar. 30, 1921	May. 4, 1921
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.70 to 3.95	3.70
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	82%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	82%
Car window glass (double strength, all sizes, A quality), New York, discount	79%	83%
Waste, wool, cents per lb	11 to 17	11 to 17
Waste, cotton (100 lb. bale), cents per lb.		
White	9.00 to 13.00	9.00 to 13.00
Colored	7.00 to 11.00	7.00 to 11.00
Asphalt, hot (150 tons minimum), per ton delivered	40.00	33.00 to 35.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	36.00	33.00 to 36.00
Asphalt, filler, per ton	36.00	36.00
Cement, New York, per bbl	3.50	3.20
Linseed oil (raw, 5 bbl. lots), New York, per gal	.68 to .70	.63
Linseed oil (boiled, 5 bbl. lots), New York, per gal	.70 to .72	.65
White lead (100 lb. keg), New York, cents per lb	.13	.13
Turpentine (bbl. lots), New York, per gal.	54	.67 to .68

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* These prices are f.o.b. works, with boxing charges extra.

Recent Incorporations

Texas Interurban Railway, Dallas. Tex.—The Texas Interurban Railway of Dallas, Tex., has been granted a charter by the Secretary of State at Austin. This is the company organized by the Strickland interests for the building of an interurban line from Dallas to Terrell, under the commitments made in the charter granted by the city of Dallas in 1917. The company is capitalized for $2,500,000, and the purpose as given in the charter is to construct and operate an electric interurban line from Dallas to Terrell, Tyler, Greenville, Paris and Denton. The incorporators are J. F. Strickland, C. E. Calder and C. W. Hobson. Other directors are: R. L. Thornton, Dallas; Walter Allen, Terrell; L. E. Griffith, Terrell; L. J. Rodney, Forney; J. C. Rugles, Mesquite; Schuyler Marshall, Mesquite. J. F. Strickland, president of the company, said that only the Terrell line would be built now, but that the company later may undertake the construction of other lines as provided for in the charter.

Track and Roadway

Lawton Railway & Lighting Company, Lawton, Okla.—Extension of the car lines of Lawton, Okla., to Fort Sill and Medicine Park is proposed by the Lawton Railway & Lighting Company, according to announcement by B. S. Stephens, its president. The proposed extension will pass through the military reservation of Fort Sill and extend about nine miles beyond to Medicine Park, which is fast becoming "the playground of Oklahoma." Plans for financing the extension, which will cost about $300,000, contemplate the sale of $60,000 of 7 per cent bonds of the present company to the people of Lawton, and when this is done St. Louis capitalists have promised to carry the project through by advancing the $240,000 remaining. Construction of the line will begin as soon as the financial details are completed.

Dallas (Tex.) Railway.—The question of forcing the Dallas Railway to comply with commitments made when the charter was granted in 1917, for the building of a double-track concrete viaduct across the Trinity River bottoms for the Oak Cliff lines, is being agitated by the Oak Cliff Commercial Association. The traction company soon after the franchise was granted constructed a portion of the viaduct, that portion over the tracks of the steam railways, thus eliminating a dangerous grade crossing, but building the rest of the viaduct was delayed on account of the cost of material. The traction company has done no further work toward the building of the viaduct, and the Oak Cliff citizens are growing restive and want immediate action.

Wichita Falls (Tex.) Traction Company. — The Wichita Falls Traction Company expects to build a new car line which will extend from Indiana Street out Sixth or Seventh Street to connect the city with residential sections now without service.

Dallas-Wichita Falls (Texas) Interurban.—Early construction of the Dallas-Wichita Falls Interurban line has been abandoned, due to inability to finance the line at this time. This action is being taken now that the Dallas Railway has already begun construction on the Dallas-Terrell line under commitments made in the 1917 charter. The plan was to have the Dallas Railway build the line to Wichita Falls in lieu of the shorter lines for which it was committed. Under the preliminary financing details, a fund of $1,000,000 was raised in Dallas and $500,000 in Wichita Falls. The General Electric Company then agreed to donate an equal amount and $4,500,000 first mortgage bonds was to be sold. Promoters of the line failed to dispose of the first mortgage bonds. Funds collected in Dallas and Wichita Falls are now being returned to the donors by Wiley Blair of Dallas, chairman of the interurban committee.

Power Houses, Shops and Buildings

Cleveland (Ohio) Railway. — The headquarters of the Cleveland Railway are now located in the new Hanna Building, Euclid Avenue and East Fourteenth Street.

Henryetta, Okla.—R. D. Long, former manager of the Muskogee (Okla.) Electric Traction Company, is attempting to finance a mammoth power plant proposal with a network of interurbans connecting Oklahoma City with Henryetta, Okmulgee and Muskogee. He is supposed to have the assurance of Eastern capital to insure completion of his plans. The proposed power plant is to be located at Henryetta, in the heart of the coal producing section of the state. The proposition is to supply most of the cities and towns of eastern Oklahoma with power from this plant.

Trade Notes

The Franklin Railway Supply Company, Inc., has moved its New York offices from 30 Church Street to 17 East Forty-second Street.

The Connecticut Blower Company, Inc., Hartford, Conn., contemplates the construction of a manufacturing and foundry building, for which plans have been prepared. The cost is estimated at $62,500.

The Johnson Fan & Blower Company has been organized, with headquarters at 115 South Clinton Street, Chicago. A. J. Johnson, formerly assistant general manager of the Ilg Ventilating Company, Chicago, is at the head of the new concern. The company will manufacture ventilating fans and blowers.

The American Forge & Manufacturing Company, 2433-41 West 48th Street, Chicago, has announced its readiness to supply copper forgings of all sorts, those for motors and motor control apparatus being its specialty. Production was started Oct. 1, 1920, and according to the announcement has reached the point where all orders can be filled.

The Eureka Stone & Marble Company, 179 West Maple Street, Columbus, Ohio, has been incorporated in the State of Ohio at $350,000 to take over the assets, good will, contracts and all other manner of business of the Eureka Marble & Tile Works Company, at the same address. Standard moisture-proof switchboard will have a special space and the company hopes to double its output in their manufacture.

The Black & Decker Manufacturing Company, Towson Heights, Baltimore, announces that its New York branch office, formerly at 141 Broadway, is now in the Printing Crafts Building, Eighth Avenue and Thirty-third Street, where a service station with stocks is also located. The Detroit branch office has been removed from 19 Selden Avenue to 27 Watson Street. The Atlanta branch office is now at 1508 Candler Building, where Thomas W. Peters, branch manager for the Southern territory, will make his headquarters.

New Advertising Literature

Engineering. — Warren D. Spengler, engineer, Hanna Building, Cleveland, is publishing a series of "Engineering Service Talks."

Foundry Sand Cutter.—The Whiting Corporation, Harvey, Ill., is distributing a four-page folder describing its motor-driven sand-cutting and screening machine for use in foundries.

Signals.—Magnetic Signal Company, Hellmann Building, Los Angeles, Cal., has issued an illustrated bulletin entitled "Safety With Economy," showing the principles and method of application of its magnetic "flagman."

Flexible Cords and Cables.—The Simplex Wire & Cable Company, 201 Devonshire Street, Boston, has developed solid-rubber-covered reinforced two-conductor and three-conductor portable cords and cable for heavy duty.

Track Grinding Machines.—Railway Trackwork Company, Clementine, Thompson and Mercer Streets, Philadelphia, has recently issued a loose-leaf bulletin on railway track equipment, giving detailed illustrated descriptions of reciprocating and rotary rail grinders.

Regulation.—"Progress in Regulation" a brief résumé of the present trend of opinion among the regulating bodies, is being circulated by Harris, Forbes & Company, New York. An account is given of the increases in rates awarded to public utility companies and extracts are published from decisions of commissions in several states.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

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Send Large Delegations to Atlantic City in October

IN VIEW of all the circumstances, the selection of Atlantic City as the place for the fall convention appears to be a wise one. Undoubtedly there are many railway men in the East who would have been pleased if the choice had fallen upon a city in the Mid-West, like Chicago, Indianapolis or Cleveland. Much has been published about railway practice in these cities, and if one of them had been chosen, an easy opportunity would have been afforded for Eastern railway men to see directly some of the construction and practice about which they have heard and read. Nevertheless, Atlantic City possesses the great advantage that the hotels are fairly near together and there are not the distractions from attendance at the meetings incident to a convention in a large city and due largely to the opportunities for excursions to points of interest. After all, the formal discussions in the meeting halls and informal ones outside are the main purposes of the convention. If these purposes are best secured at a meeting place like Atlantic City, then the choice of that place is justified.

The exhibits will necessarily be missed, especially at Atlantic City, but the decision to omit them applies only to this year. If conditions are more favorable next year, the exhibits will be appreciated all the more because of this year's omission. But each member company, including the manufacturing companies, should send as many delegates as it can afford to Atlantic City in October of this year, for the program of subjects is bound to be an attractive one, and the convention will be well worth the trip, in spite of the absence of exhibits.

Tendency to Settle Wages Without Strikes Is Gratifying

THERE has been a growing and gratifying tendency in electric railway labor matters for companies and men to settle their wage questions directly and without the intermediation of arbitrators. A number of cases of this kind have already been mentioned in previous issues of this paper. Another and conspicuous instance occurred last week when the employees of the Detroit United Railways agreed by a vote of four to one to accept the company's offer in its entirety. In this case three propositions were submitted for consideration, namely, acceptance, arbitration and strike, and the first was adopted by a vote as compared with the second of seventeen to one and as compared with the third of five to one.

Of course a decision of this kind cannot be reached unless the question is approached by both sides in a spirit of reasonableness and desire for settlement. Even when this is done, resort must often be had to arbitration, and it is no reflection on the attitude taken by either side when the opinions of impartial arbitrators are asked. But a direct settlement, where possible, is quicker and more preferable.

It has also been noticeable and gratifying that the number of electric railway strikes over wage reductions during the past six months have been very few. In fact, except for Akron, where the men stopped work on May 5, but later went back, pending arbitration, Albany has been the only conspicuous case of a strike, and the company there was the first of the larger companies to make a wage reduction. There were many dire predictions of industrial trouble to follow a decrease in wages when the lowering cost of living foreshadowed such a reduction, but fortunately these predictions proved false. Undoubtedly both sides have been anxious to avoid strikes, one reason being that the men know the extent of present unemployment, while the companies realize that during the past few years, with their high wages and saving habits, developed through Liberty Loan campaigns, the men have presumably more reserve capital to live on during a strike period than formerly.

Another and still more important reason for the small number of strikes has been that a reasonable wage reduction at this time is recognized as fully justifiable in view of the admitted decrease in the cost of living. That this increase is actual in spite of the persistence of some high charges, like rent, has been so clearly demonstrated as to be undeniable. Perhaps the most extended recent compilation on this point is that contained in the evidence submitted by the employing printers of New York in their recent arbitration case on wages.

Association's Publicity Section Is Doing Constructive Work

ONE of the most constructive pieces of work which the American Electric Railway Association has yet done is that which the Advertising Section of the Bureau of Information and Service is now doing. As the editors of this paper see it—and this opinion reflects the thought of many others—the Advertising Section is the correct answer to the question, "How Shall the Association Handle Railway Publicity?" In other words, the association is now organized to speak authoritatively to the public—to put the best thought of the industry into bringing out the public's problem from the public's point of view, as real news matter. And the Advertising Section is doing the job.

This section is organized for the purpose of providing a news service to newspapers and any other legitimate publicity medium in the effort to get the true story of the electric railway business before the public, for it is with the public that the railways do business, and in their hands, in the final analysis, rest the restrictions and privileges under which the railways have to work. Further, and even more important, perhaps, this section must open up the channels to these publicity mediums so that the copy is used and must establish a confidence that the material furnished is legitimate, correct and real informative news, not propaganda. Another function of the section is to make a study of possible new methods of railway publicity. The movie is one example of this, as has been suggested in these columns from time to time. And the movie has been utilized, too. The movie "news" films were busy on Electric Railway Day, May 4.

Naturally the success of any such program depends largely upon the personality of those handling the work. The important fact about the present situation is that not only has the association adopted the right method, but it has apparently found the right man to carry it out.

That the section has been accomplishing results of real value to the industry is shown by the story of its work to date, printed elsewhere in this issue. Most companies have concrete evidence of some of this work in their own local press. The work now in hand and planned for the near future is of a most valuable nature and will doubtless have a real and far reaching effect. There has been more useful railway publicity in the past few months since this section was organized than the railways have had in the same number of years, and more of it is to come.

President Gadsden of the American Electric Railway Association is appealing this week, in the name of the Committee of One Hundred, for support of the Advertising Section. While this appeal is addressed, naturally, to the members of the association, it may well be heeded by railway and manufacturer companies who are not members, for this is a movement from which all benefit directly and indirectly. The Committee of One Hundred is a committee of the industry, but naturally turns to the association for machinery and a working organization to accomplish its results. This last sentence, by the way, seems to present good arguments why all railways and railway manufacturing companies should belong to the association and take an active interest in its work.

The association needs and merits support in this publicity activity.

Peace by Understanding in the State Where People Have to Be Shown

PEACE by understanding has been accomplished in a rate proceeding in Missouri. The case was that of the Kansas City, Clay County & St. Joseph Railway. As noted elsewhere in this issue, the company was seeking a 25 per cent increase in rates. First of all a canvass was made by the company to obtain the opinion of the public with respect to the company and its service. Next the need for the increase was explained and explained so well that there was no contention against the raise as a whole. The application for the increase contained less than 1,000 words. The testimony was brief, for the need for any protracted presentation had been removed when all the different parties with axes to grind had been brought together previously and a basis was established on which proper recognition of the rights of each was secured. As a result the company has obtained its increase, the utility of the service to the community has been preserved to its fullest extent and the relations between the company and its patrons have been improved immensely through a better understanding on the part of each of the problems of the other. The settlement reached so amicably undoubtedly would have been impossible of attainment under any but the give and take attitude that was manifested after representatives of the company had pointed out wherein all stood to lose if any attempt were made by any party to the readjustment at insistence upon what it considered its inalienable rights. The story of this attainment is a concrete example of building better public relations that every one connected with the industry in an executive capacity owes it to himself to read.

Take an Active Part in Federal Government

WHAT influences a Congressman? Probably nothing else so effectively as a knowledge of what his constituents legitimately and conscientiously desire. If this is so, it is a duty as well as an opportunity to let representatives in Congress know what is desired and what is felt to be necessary. If one has any influence, he should exert it.

There are several outstanding questions today which are receiving more or less public notice, but particular attention is here called to the questions of taxation, federal reorganization and additional appropriations for certain departments to do specific work which is much needed.

This week President Gadsden spoke before the Senate finance committee with reference to public utility taxation. Ideas are only commencing to formulate on federal taxation and that question will be treated further in these columns as matters develop.

Government reorganization, however, is a vital matter already advanced considerably in congressional study and every impetus which can be given this most desirable move is worth while. The government is primarily an organization to serve the people in their daily individual and collective pursuits, but at present its cluttered up and ponderous, complex and illogical organization reduces its efficiency to an absurd point. Intelligent reorganization is needed and should be supported on the basis of grouping together those functions which are devoted to a given purpose. The administration is making an honest effort to see that it is done right and soon and needs support. The longer the organization is allowed to run as it now is the harder it will be to change it effectively, for a new administration soon gets settled in its ways.

The question of additional appropriations is a complex one and many of its angles are more political in nature than otherwise. But it is worth while pointing out the facts in connection with the requests of the Department of Commerce, which is most closely connected with the industrial and business situation. Herbert Hoover, Secretary of Commerce, has come into the Cabinet with the idea of making his department a real aid to the industry and commerce of the nation. He has called into counsel able representatives of the various lines of industrial and commercial activity and is fast coming to a conclusion as to how best the department may function to provide a service which will really aid business. He finds that, with the appropriations available for the remainder of the fiscal year, he is handicapped in, if not actually prevented from, performing this service and has asked Congress for something over $600,000 additional. In a way this $600,000 is in the nature of a capital investment, for Mr. Hoover contemplates a return of $1,500,000 from other directions if he can carry out his desires.

This request should be supported actively. Only this week Julius Kruttschnitt, chairman of the board of the Southern Pacific, points to the business depression as being beyond the state that railroad rates can affect. The point now is that Herbert Hoover has a plan to help and help quickly. Among others, the editors of business and technical papers have been given the opportunity of analyzing his requests and of cross-questioning him on his plans and methods. They are sound and practical.

Congress should be pressed to act in these matters. The way to do this is to write to the Congressmen. The time to do it is now.

Minnesota Takes a Forward Step in Electric Railway Franchise Law

IN HER new law enlarging the functions of the Railroad and Warehouse Commission, Minnesota has included a clause with reference to indeterminate franchises which should be appreciated concretely by railway companies in Minnesota, and, to a certain extent, though perhaps abstractly, by railways in other states which have not progressed so far in franchise law. The state, in Minnesota, has assumed the responsibilities which a state should assume when it starts to regulate utilities. Regulation by the state is the proper policy, but only when the state can contribute something by its regulation, and this Minnesota now does.

For the future, all railway franchises in Minnesota are, at the option of the company, made indeterminate, whether they are now term franchises or not. This applies, however, only in case the company is a Minnesota corporation. No other provisions or requirements of the existing franchises are modified. Except by future legislative action in line with the police power of the state, such indeterminate franchises may be terminated only upon purchase of the railway property by the city on one of three fair bases of price determination provided in the law.

The law is clean cut in giving to the City Council, without reference to a popular vote, the right to grant franchises. The Council also has control over service standards, routes, etc., and its decisions are not subject to appeal. The commission, on the other hand, has initial and exclusive power over fares and charges, subject only to appeal to the District Court. The commission also has supervision over security issues.

Perhaps the most peculiar—and questionable—provision of the law is that which makes all cities flat fare cities with full free transfers and retransfer privileges. This provision of the law is a formal recognition of the conviction of one large element, and probably the predominating element, of the American public that cities, at least those of moderate size, should be on a flat railway fare basis. It does, however, preclude any experiment of investigation of other means of charging for street railway rides.

Another somewhat peculiar provision is that "all cars used shall be of modern design and . . . shall at least equal in quality, style and design cars now operated in such city." It is the latter part of the quotation which particularly attracts attention, as it might be hard to tell what equality in design means.

The law on the whole, however, is an advance. Its provisions should stabilize the electric railway industry in Minnesota, for the state now practically guarantees fair treatment to legitimately invested capital. First it provides, at least by inference, that fares may be charged sufficient to yield a reasonable return on a fair valuation. Second, it makes obligatory the purchase by the city in case the city desires to terminate the franchises.

As noted last week, the Duluth Street Railway has already elected to come under the provisions of the new law. This is at least an indication of its value, as seen by those most affected by it.

Avoid a One-Sided View of the Budget System

THOSE who look upon the budget plan as merely a scheme for cutting expenses regardless of results are not aware that its function is three-sided. It acts, of course, to eliminate waste, but it also serves to encourage investment in expense-reducing equipment and to stimulate revenue production. This fact has been illustrated in several articles on budgets which have been presented in recent issues of this paper. The latest was that outlining the plan in use on the Rochester & Syracuse Railroad appearing in the April 30 issue. The plan was commented on editorially in the same issue. It is essentially like other successful plans in that it depends for its best results on co-operation, and only with co-operation can the highest degree of long-run economy be secured.

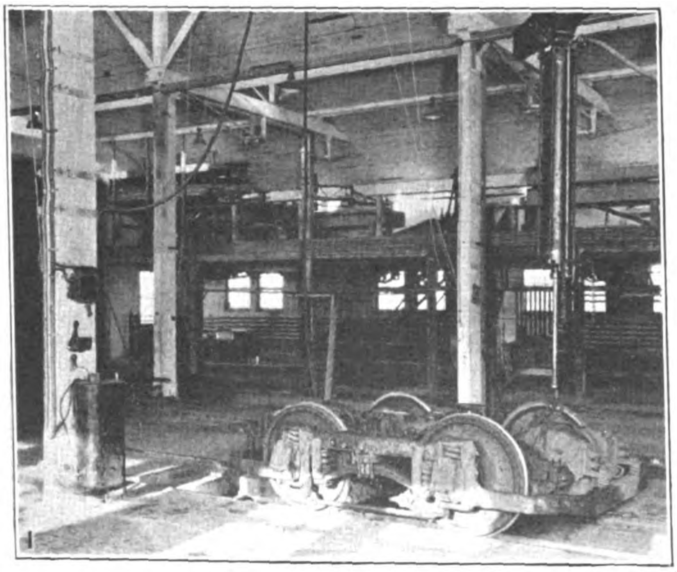
These remarks are prompted partly from observation of the inability of some department heads to get the money for equipment and construction which will surely pay by returns on the investment. The answer is usually: "You have proved your case, but we haven't the money"; and this answer, unfortunately, is often correct. But if an expenditure will pay a return of, say, 25 per cent on the investment, it ought to be possible to get the money. The budget will help to do it by insuring the best possible distribution of available funds and by demonstrating the necessity for getting in more revenue. Under a system, or lack of it, by which the several departments are not kept informed of all details of the finances, each head is apt to push for all he can get, regardless of the effect on others. A good budget plan eliminates this.

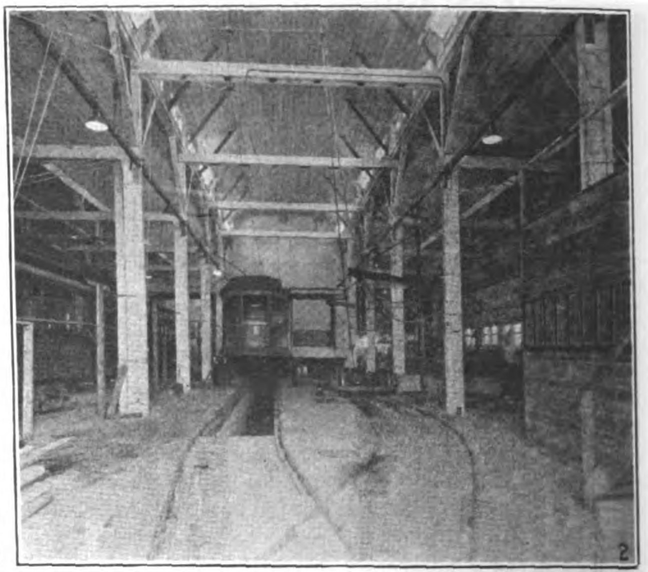
Quotation from the Federal Electric Railways Commission Report

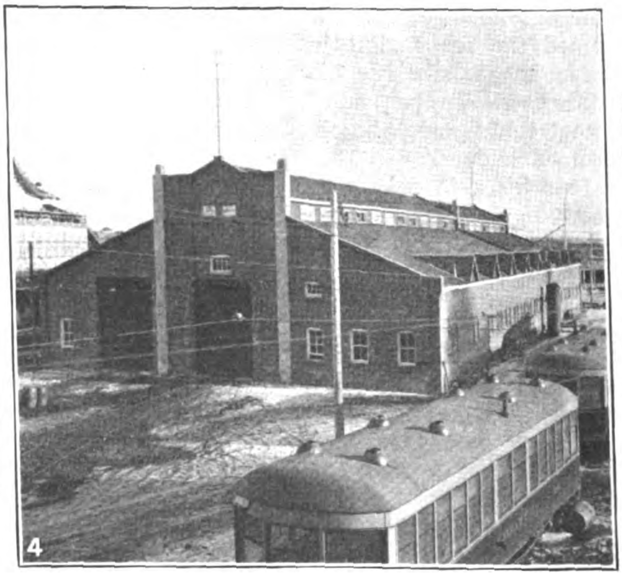
No. 20

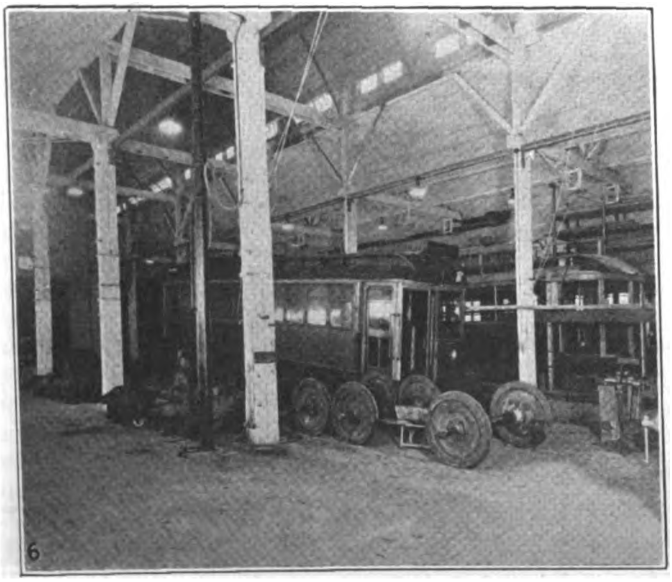
TO A degree unknown to private business enterprises, which to a certain extent are able to finance capital expenditures from earnings, the electric railways are dependent upon new investment—new capital—for the extension, improvement and betterment of the service which they perform. Communities need and are constantly demanding additional local transportation facilities. They require large sums of money, which can only come from those with savings to invest. When the flow of new capital ceases, when the confidence of the investor in the ability of the enterprise to safeguard the integrity of the investment and to insure a fair return thereon ceases, new capital is unobtainable and the utility can no longer serve the purpose for which it was created. This condition is now present. Lack of confidence in electric railway investment exists today to a degree which has caused a partial paralysis, is working havoc with the finances of the companies and is depriving the public of the service to an alarming extent.

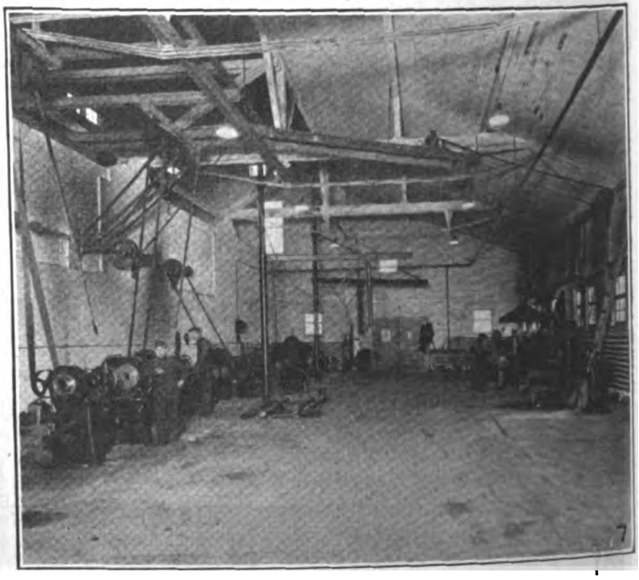
Former Horse Barn Makes Good Shop Building in Calgary







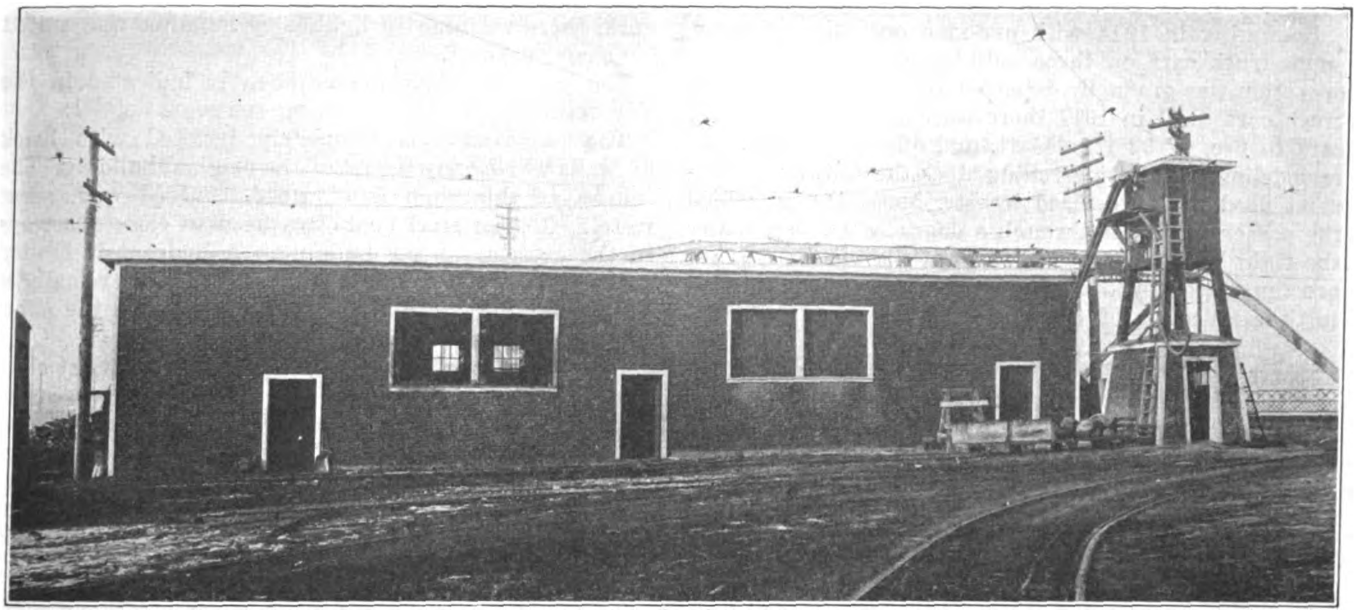




1. Air hoist and arrangement for operating trucks under their own power.
2. General view of Calgary shop.
3. Construction view of shop steam pipe line.
4. Shop building Calgary Municipal Railway.
5. Expansion bend in shop steam line.
6. This is a glance at the truck section.
7. Machine shop is roomy and cheery.

Recent Developments at Calgary

A Shop Evolved from a Horse Barn; an Attractive Resort, Bowness Park, and a Convenient Sand and Fuel House Are Among the Outstanding Physical Improvements on This Alberta Municipal Property



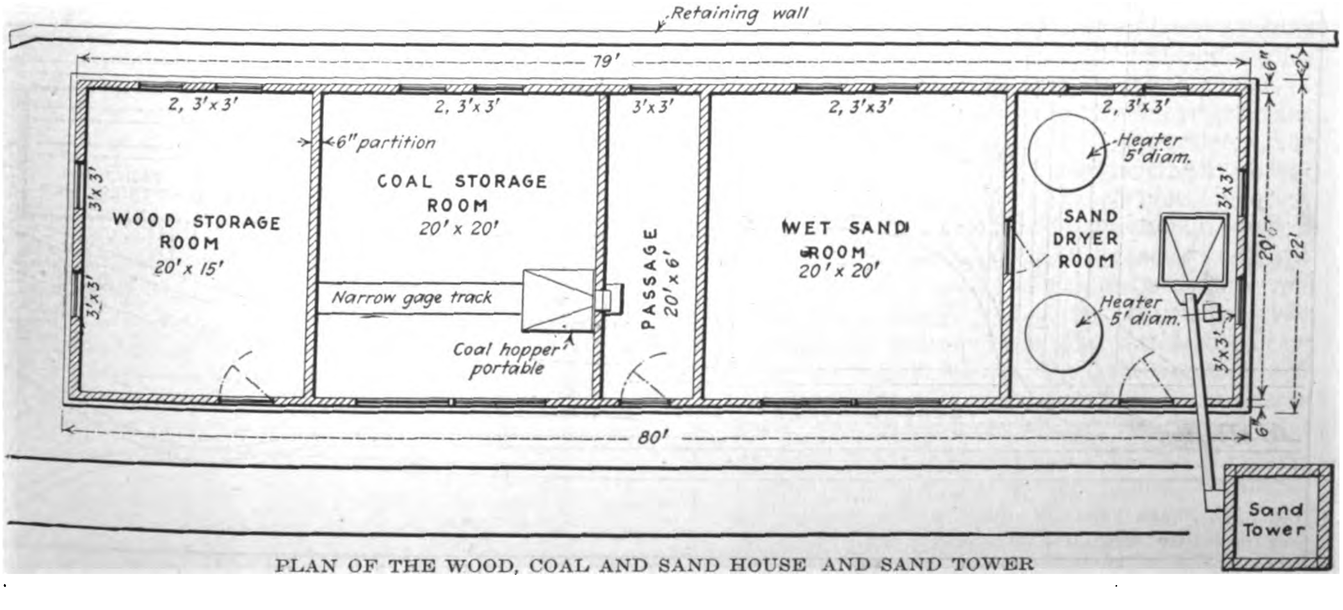
COAL, SAND AND WOOD STORAGE BUILDING, WITH SAND TOWER AT RIGHT

THE Calgary Municipal Railway operates 83 miles of track in a city having a population of more than 75,000, which is spread over an area of 40½ square miles. The population density is low, rendering the furnishing of profitable electric railway service a matter of some difficulty.

The electric railway department is at present combined with the lighting department under the immediate direction of R. A. Brown, who has the title of general superintendent of electric light and railway departments. The two departments were combined after the resignation of Thomas H. McCauley as superintendent of the railway department early in 1920. Mr. Brown reports to Commissioner A. G. Graves, one of the three commissioners who look after the city government, the other commissioners being the Mayor and the commissioner in charge of public works. Mr. Graves has supervision of public utilities.

Calgary, like other cities in western Canada, was overbuilt during the boom years between 1909 and 1913, and the electric railway service was correspondingly expanded in the expectation of a continuation of the expansion of those days.

The war brought a tremendous reaction. As reflected in the electric railway traffic, the reaction was indicated by a falling off in numbers of passengers carried annually from 24,000,000 in 1913 to 17,500,000 in 1916. In 1920 the number carried was 17,091,356. During the


Retaining wall
79'
2, 3'x3'
2, 3'x3'
3'x3'
2, 3'x3'
2, 3'x3'
6" partition
3'x3'
3'x3'
WOOD STORAGE ROOM 20'x 15'
COAL STORAGE ROOM 20'x 20'
Narrow gage track
Coal hopper portable
PASSAGE 20'x 6'
WET SAND ROOM 20'x 20'
Heater 5'diam.
SAND DRYER ROOM
Heater 5'diam.
3'x3'
3'x3'
6"
20'0"
22'
6"
80'
Sand Tower

PLAN OF THE WOOD, COAL AND SAND HOUSE AND SAND TOWER wartime slump the railway found itself with more track and cars than it needed. There was also a critical shortage of men to operate the system. This situation was met by the changing over of the cars to one-man operation under the direction of Mr. McCauley. This change was so significant that it deserves now a few words of review in the light of the intervening progress in this line that has been made. The situation was described at the time in an article by Mr. McCauley, published in the Sept. 22, 1917, issue of this paper.

Beginning in 1914 with one-man operation of some single-truck cars on three outlying lines, this type of operation was gradually extended and applied on double-truck cars until in 1917 there were forty-two one-man cars in use, of 32 ft., 41½ ft. and 46½ ft. lengths. In remodeling the existing rolling-stock the railway department used a plan devised by Mr. McCauley, in which the passengers enter through a doorway which replaces the right-hand panel of the front of the vestibule. They are thus faced by the operator as they enter, facilitating the collection of fares.

SHOP FACILITIES RECENTLY GREATLY IMPROVED

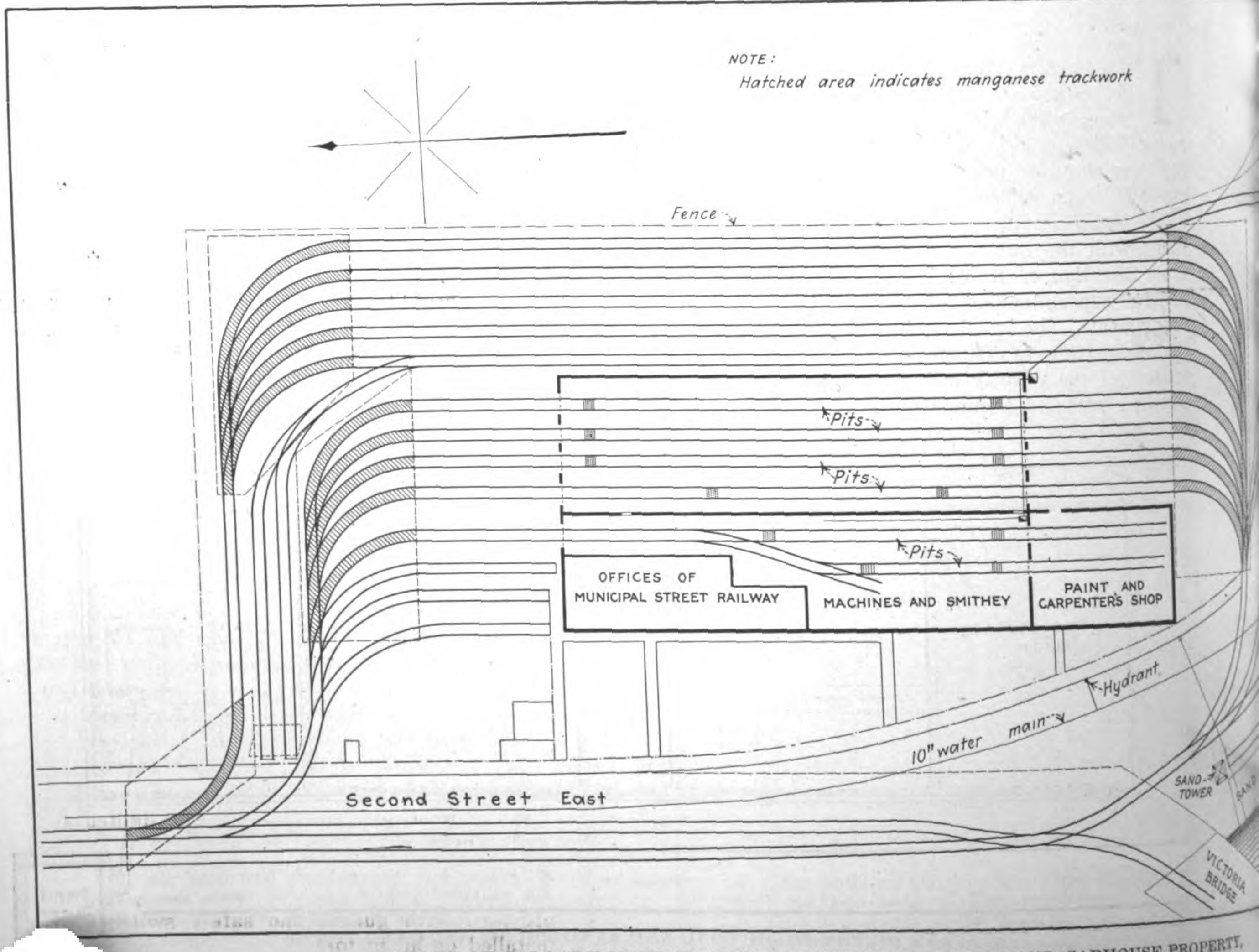
With the above few historical data as a background, it will be of interest to note the most important of the recent developments on this municipal property. After the armistice was signed, Superintendent Brown was able to secure for the railway department a building formerly used as a stable for the city public works department. It was located near the former overcrowded carhouse, shop and office building, as is shown in an accompanying plan.

The shop building is of brick and frame construction, and it formerly contained two floors. The lower floor was used as a stable and the upper as a hayloft. In the reconstruction the second floor was removed and wooden trusses were installed to support the roof. The material reclaimed furnished nearly enough lumber to make all of the alterations. The windows in the side walls were enlarged also and, after completion of the work, there remained a light, airy building well suited for shop purposes.

The general layout of the shop is indicated in the plan reproduced. The following are some details:

The paint shop is completely inclosed with brick firewalls which were a part of the original building. The ceiling of this shop is of wood, covered with sheet metal. Rolling steel doors are used to close doorways in the exterior of the building. A hydrant is located in this shop for fire protection so that the remainder of the building is fairly well protected from the effect of fire which might arise in the paint shop.

The machine shop is located alongside the paint shop. This contains a corner for the blacksmith, this corner being furnished with a forge, a mechanically driven hammer and other miscellaneous forging equipment. There are also here a large wheel lathe, a hydraulic press, a machinist's lathe, a pipe-and-bolt cutter, an emery wheel stand, a drillpress, a hacksaw and a babbitting bench.



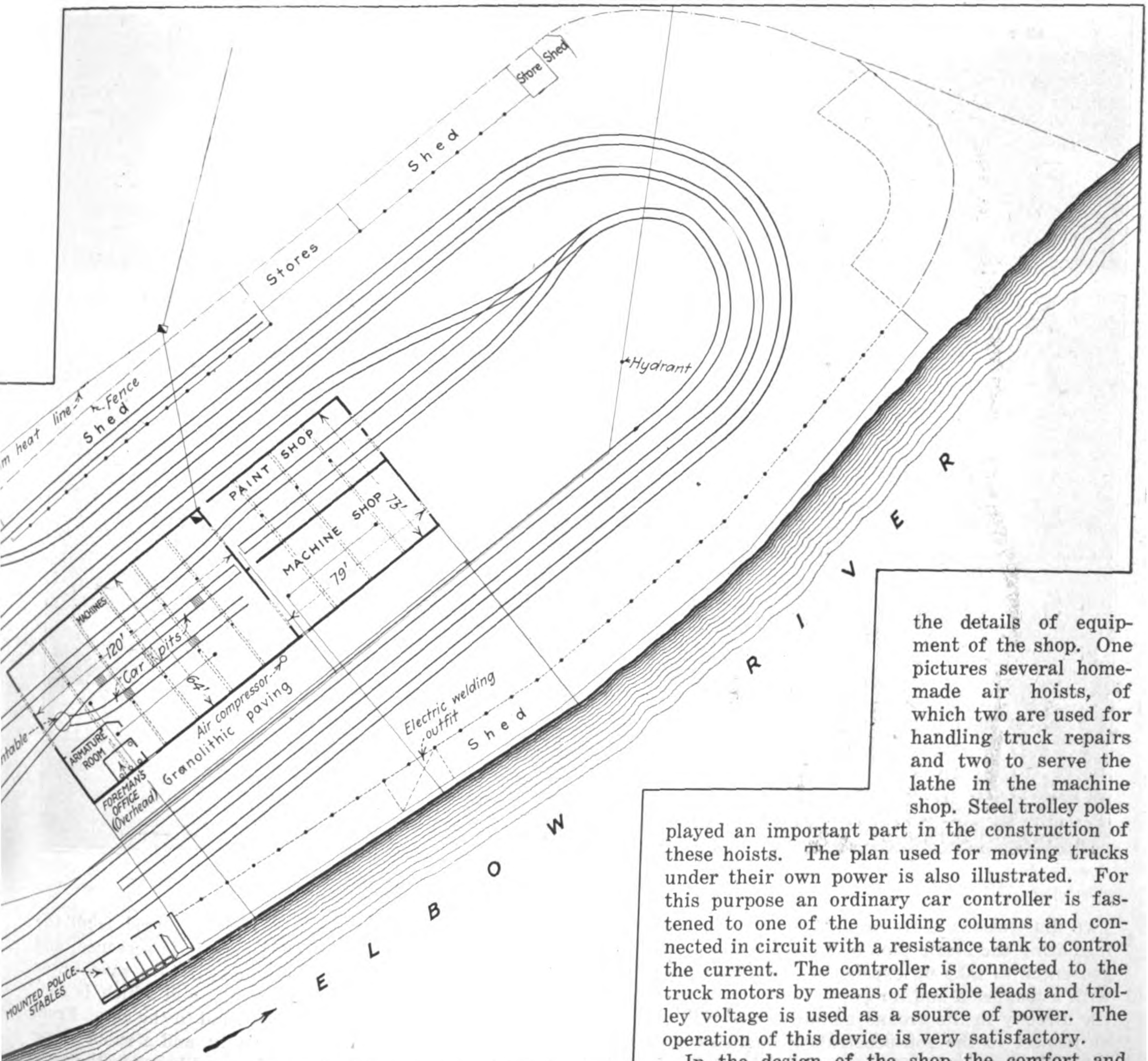
LAYOUT OF CALGARY MUNICIPAL RAILWAY'S SHOP, OFFICE AND CARHOUSE PROPERTY

The carpenter shop is provided with a balcony which furnishes a convenient support for the shafting for the heavy machines placed on the main floor. Above the balcony are a few woodworking machines, several benches and a lumber drying rack.

Opposite the carpenter shop is the truck repair shop, together with air compressor and controller repair benches. This shop contains also an air compressor of a capacity of 50 cu.ft. per minute with a receiver located out of doors.

The front end of the building contains a toilet room and an armature room with office and storeroom above. The armature room is provided with a monorail hoist for handling armatures. It is planned in the future to install also a Universal armature machine in this room. Here is also located a Century electric armature and field tester. Insulation tests are made by applying the trolley voltage of 550 to the armature.

Considerations of economy made it necessary to use wooden doors covered with sheet metal in the front of the building, although it was realized that these are more difficult to handle than the rolling steel doors used elsewhere in the building. In addition to the lower cost, the heat non-conductivity of the wood was a factor in heat conservation, which is considered to be a very important matter in a climate as cold as that of Calgary.


Store Shed
Shed
Stores
heat line
Fence
Shed
Hydrant
PAINT SHOP
MACHINE SHOP
73'
79'
MACHINES
120'
Car pits
64'
Air compressor
Granolithic paving
ARMATURE ROOM
FOREMAN'S OFFICE (Overhead)
ntable
Electric welding outfit
Shed
MOUNTED POLICE STABLES
E L B O W R I V E R
0' 20' 40' 60' 80' 100' 120'

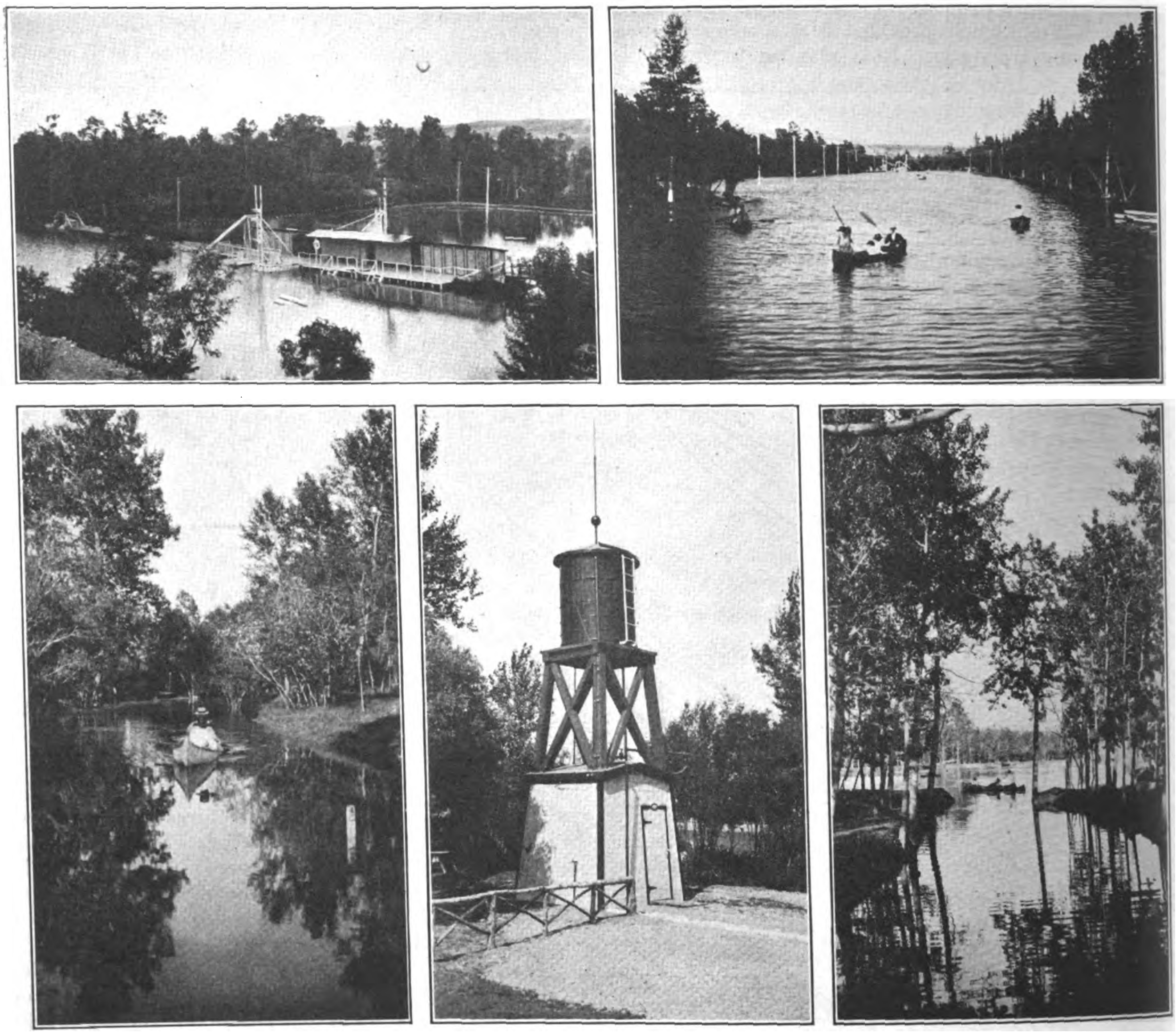
OCATED AT SECOND STREET AND EAST VICTORIA PARK

Photographs have been reproduced to show some of the details of equipment of the shop. One pictures several home-made air hoists, of which two are used for handling truck repairs and two to serve the lathe in the machine shop. Steel trolley poles played an important part in the construction of these hoists. The plan used for moving trucks under their own power is also illustrated. For this purpose an ordinary car controller is fastened to one of the building columns and connected in circuit with a resistance tank to control the current. The controller is connected to the truck motors by means of flexible leads and trolley voltage is used as a source of power. The operation of this device is very satisfactory.

In the design of the shop the comfort and safety of the employees were ruling considerations. The shop is well heated, well lighted and well ventilated, the monitor roof being an important factor in the last-mentioned two items. All exposed gears, belts, circular saws, etc., are provided with guards and safety switches are installed on all motors.

The shop department has made an excellent start in the direction of electric welding, a special booth out of doors having been provided for that purpose. The location of this is shown in the plan. Here worn-out gear cases, broken castings and other parts are repaired, and the welding outfit is also useful to the track department in building up cupped rail joints.

A large saving was made in the heating of the shop by connecting it by means of a well-insulated pipe line with the municipal power plant located 2,000 ft. away. Two illustrations show respectively the method used in insulating the steam pipe and in installing a horizontal gooseneck to take up expansion. The pipe, surrounded with a magnesia and tar paper covering, is laid in split tile directly in the ground and at an unusual depth, out of respect to the soil-penetrating qualities of winter's cold. The gooseneck is in a two-division concrete-walled chamber, designed in this way to permit deformation of the bend and to furnish ample support for the cover and soil above.



VIEWS IN BOWNESS PARK, WHICH DEMONSTRATE THAT MUCH HAS BEEN MADE FROM LITTLE

On account of climatic conditions large quantities of coal and wood are required in the winter for heating the cars, for which purpose hot air heaters are used. It is necessary also to store a great amount of sand because of the difficulties of securing sand in the dead of winter. Mr. Brown has, therefore, given special attention to the design and construction of a building for the storage of these necessities and for the drying and delivery of the sand. The plan of the building is shown on page 887. It provides bin capacity for storing about 100 tons of coal and 120 tons of sand.

In the coal storage room is located a hopper, mounted on trucks, and bags are filled in the passageway from this hopper. Sand is dried with natural gas heaters in the sand-drying room. It is transferred from the heaters to a concrete hopper, where it is screened, and is then elevated by a bucket conveyor to a sand tower which has a small storage capacity and which is conveniently located for a supply of sand to the cars. From the tower the sand drops by gravity, and a rubber hose is used to direct the flow into the sand boxes in the cars.

BOWNESS PARK IS ATTRACTIVE AND PROFITABLE

The city of Calgary is not well provided with public parks, so that the park maintained and operated by the railway department, about 7 miles west of the city on the Bow River, is a real factor in providing recreation for Calgarians. The accompanying group of typical views in the park furnish all needed commentary upon the success of the railway department in building up an attractive resort. From these pictures it is difficult to realize that this attractive park is almost entirely artificial, much ingenuity having been expended in diverting water from the river and directing and impounding it by means of dikes. The waterways were fixed up to provide boating and bathing facilities for the railway patrons and every effort was made to provide for the general comfort of the public. The catering privileges in Bowness Park are leased out for $3,500 per season. Round-trip tickets to the park are sold for 20 cents, and a considerable source of income for the railway department has thus been created.

Gasoline Motor Driven Car Tried

A CAR propelled by a gasoline motor and designed to supplant branch line trains and interurban electric cars is being exhibited and operated in St. Louis, Mo., by the Bowen Motor Railways Corporation of St. Louis. The car is being operated daily from Union Station, St. Louis, traversing the Creve Cœur branch of the Missouri Pacific Railway to Creve Cœur Lake. The actual running time for the round trip, a distance of 40 miles, is two hours and thirty-four minutes. About 5½ gal. of gasoline is consumed, which is an average of about 7 miles to the gallon.

The motive power of the car is a 50-hp. gasoline motor, which is slung in front of the body of the car and has a hood covering similar to that of an automobile. The car has a drive shaft like that of a motor car and the power is conducted to the rear wheels through a differential.

The body is similar but shorter than the ordinary electric car. It will seat thirty-five persons and the engine has enough power so that a trailer can be attached if necessary. Electric lights and hot water heat are part of the equipment.

Electrification Progress in Brazil

ELECTRIFICATION in Brazil is expected to take on considerable activity this year. A recent report in the *Wall Street Journal* states that a bill authorizing the first step of the electrification of the government-owned Central Railway of Brazil has been passed by Congress and a decree to that effect has been issued by the President. The first step includes electrification of numerous suburban lines out of Rio de Janeiro and lines running into Sao Paulo. An expenditure of an amount equivalent to about $10,000,000 under normal rates of exchange has been authorized. A year ago the Brazilian Congress voted $500,000 for an extensive survey. This will be the second large electrification project undertaken in Brazil. The other is the electrification of 28 miles of the Paulista Railway, begun last summer and to be completed about June, 1921.

During the war work on extensions of the Metropolitan Underground Railway in Paris practically ceased because of the scarcity of labor. Later financial conditions forbade much new construction, but reports from Paris indicate that an extension of line 7, in some respects the most interesting of any from a constructional standpoint, is now being completed. It extends from the Palais Royal under the Louvre and then along the river bank to the Hotel de Ville.

Omissions in Inventories

A Carefully Conducted Appraisal of an Electric Railway Property Made Recently Disclosed Omissions in Previous Appraisals Amounting to 7.75 per Cent of the Total Valuation

BY LESLIE F. VAN HAGAN
Professor of Railway Engineering, University of Wisconsin

THE term "inventory," as used herein, means the listed items of physical property that make up a plant. In making an appraisal, the first thing to do is to list all physical property. Those who are familiar with appraisal work know that the chief difficulty in preparing an inventory is to find all of the property. The errors of inventory are usually errors of omission. Engineers recognize this condition and provide for it by adding to the value of the property an amount which they consider sufficient to cover "omissions and contingencies." It is usually computed as a percentage of the value of the property. It should be understood, also, that the omissions which the engineer attempts so to cover may be omissions in pricing as well as omissions in inventory.

Just how much of an allowance should be made to cover this item has been a matter of pure speculation. So far as the writer knows, no actual statistics have been brought forth at any time in support of the various allowances that have been used. The allowances have been "guessed at" and supported by the test of "reasonableness." Under existing circumstances that is about all that can be done, but obviously it would be desirable to have concrete information on this point. The purpose of the present article is to contribute a bit toward the accumulation of such information.

The writer was recently called upon to review appraisals of the same street railway property that had been made by the same public utilities commission at periods several years apart for the purpose of determining the reason for certain apparent inconsistencies. It was evident that increases in the appraised value of the property would arise from some or all of the following sources: (1) Additions to the property; (2) increases in unit prices; (3) increases in overhead allowances, and (4) more careful inventorying that would reveal hidden quantities. Without going into detail about methods, it may be simply stated that it was finally determined that there had been an increase in the latest inventory, arising from more thorough inventorying, that amounted to 7.75 per cent of the physical property that had existed at the time of the preceding inventory. That is to say, the evidence was that the earlier inventory showed only 92.25 per cent of the property that the later inventory showed was in existence at the time the earlier inventory was made.

This figure of 7.75 per cent is somewhat startling. The writer knows of no appraisal made by a public utilities commission in which so high an allowance for this item has been allowed to stand. On the other hand, he knows of no previous attempt to determine definitely what degree of accuracy is actually attained in inventorying property. The allowance percentages that are used are largely matters of custom and are copied from one appraisal to another. An allowance of 2 or 3 per cent has been commonly used by state commissions.

There can be no denying that the degree of accuracy varies for various inventories. Even if 3 per cent be accepted as a fair average allowance for "omissions and contingencies" it is to be expected that, in some cases, the actual percentage will be higher and in some cases it will be lower. In other words, the conditions under which an inventory is made will affect its accuracy. It is of interest, therefore, to note the conditions under which these inventories were made.

CONDITIONS UNDER WHICH THE APPRAISALS WERE MADE

There have been three appraisals of the property in question, one in 1907, one in 1910 and the latest in 1914. In all three the street railway company and the commission co-operated in varying degrees. In preparing the 1907 inventory it was originally agreed that the inventory would be furnished by the company and priced by the commission, but the company was so slow and indifferent that the commission had to do a large portion of the inventorying. The president of the company stated frankly that he regarded the appraisal as being intended for taxing purposes, and the company representatives guided themselves by his attitude. The company was in a better position than any outsider to inventory the property, and without the company's complete co-operation the work proceeded under a decided disadvantage. The resulting appraisal was obviously faulty and was soon superseded by the 1910 appraisal.

When the 1910 appraisal was made the question of rates had become predominant and the company's policy had begun to change in the direction of securing as high a valuation as possible. There was greater co-operation between the company and the commission in preparing this inventory, but they did not work under a thoroughly planned scheme that fixed definitely the activities and responsibilities of each party. The commission depended largely upon the company for the inventory, but the company had not yet reached a full appreciation of the importance of making a complete inventory nor the fact that it would have to organize especially for the work. Regular employees were called upon to devote to the inventory such time as could be spared from their regular work, with the result that the inventory received secondary consideration. The commission's engineers supplemented the company's efforts. They had access to company records, but the records, particularly for property acquired many years before by purchase, were not all that could be desired. There was not time to make thorough field surveys, so various short cuts and approximations were necessarily used. It is not surprising, therefore, that the result was imperfect.

The rate question continued to increase in importance, and the company finally awoke fully to the fact that it was to the company interest to have a complete inventory of the property. After some consultation with the commission's engineers and statisticians, the company began to make such an inventory. An organization was set up which developed as the work proceeded until it assumed fairly large proportions. Field parties were sent out, and, at the same time, company records were searched for information that would throw light upon the task. When the inventory was complete it was turned over to the commission's engineers to be checked and priced. The commission's engineers checked approximately 10 per cent of the company's inventory upon the theory that a 10 per cent check would reveal the degree of fairness and accuracy of the company's work. Whenever, in the case of a given item, the check proved unsatisfactory a more complete check of the item was made. Where it was possible to do so, the 1914 quantities were compared with the corresponding 1910 quantities and the differences were satisfactorily explained or corrections were made. The two sets of engineers—those of the company and those of the commission—worked upon the principle that inventory quantities are matters of fact about which there should be very few differences of opinion. In general, the company's work proved to be fair and accurate. In spite of the careful work of the company in making the inventory, it cannot be claimed that it is perfect. The company learned many things about inventory methods during the progress of the work that it would undoubtedly use to advantage if it were to make a new inventory.

GRADING, LONG FORGOTTEN, HAD BEEN DONE

Although the indications are that much property included in 1914 was omitted in 1910, it is not possible to point out exactly what the omitted items were. All that can be stated definitely is that the property shown in the 1914 inventory was actually there. Some few of the omitted items, however, can be identified. For example, a search through old franchises and deeds revealed a number of places where the company had been obliged to do grading that would not be picked up by a field inventory party. One such piece of grading contained nearly 140,000 cu.yd. of material. Again, the company investigated a number of heavy embankments on its interurban lines, where records showed that there had been trouble from settlement during construction. A well-drilling outfit was used and holes were bored through the embankments in a number of places. About $150,000 worth of hidden grading material, not included in the 1910 inventory, was discovered and added. These instances are offered not only to illustrate why property is sometimes overlooked but also as a sidelight upon the efforts that were made in 1914 to find all existing property.

The writer is not interested particularly in seeing a higher figure established for the allowance for omissions. As an engineer he is not ready to admit, until confronted by convincing data, that it is impossible to attain a 97 per cent result in inventorying. Inferentially, the smaller the allowance an engineer makes for omissions the higher is the quality of his work; engineers in the employ of state commissions are going to keep the figure for omissions as low as possible. At the same time it seems evident, from the facts here presented, that there may be justification for breaking away from the figure of 3 per cent when conditions make it seem advisable. If we accept a 3 per cent allowance for omissions in inventory and pricing as an average figure (perhaps it should be considered the minimum figure), variations from that figure should be permitted whenever the conditions that surround the making of the inventory justify them.

Without doubt there are figures in the possession of various state commissions that would establish the limits within which the allowance should vary. It would not be difficult to make studies similar to that upon which this paper is based, and the information would be well worth the trouble.

Engineer vs. Auditor in Cost Keeping

A Conference of These Department Heads with the General Manager Brings to Light the Common Controversy and Points Out the Moral in an Interesting Colloquy

BY E. A. W.

"WHAT does this mean, $14,000 for an extension of our 60,000-volt transmission line up Dry Creek and we are going to abandon that line next year?" It was the general manager talking, and he had the chief engineer seated before him. "You told me before you started the job it would not run over $10,000."

"We based our estimate on figures given us by the cost department," replied the chief engineer. "To be sure we didn't go into details. You were in a hurry and we supposed the cost department figures on the Bear Cañon extension would be close enough. The two extensions are almost identical."

The general manager, or "old man" as he was popularly called, sent for the auditor. Upon his arrival he went into executive session on the subject of costs, costkeeping, cost analysis, and proper preparation of estimates, with the chief engineer and auditor.

There were many opinions and thoughts uttered. The auditor got his back up at one stage of the game and declared his department should not be held responsible for detailed cost data, that the compilation of such information was an engineering function. This argument was joyfully received and acquiesced in by the chief engineer. The general manager threw a bucket of ice water on the proposition by declaring that cost data, to be of value, must check precisely with the general books, and he was agreeable to the cost records being kept by the engineering department provided the auditor would vouch for their accuracy and be willing to take the stand before a court or the utilities commission and swear to values by quoting and use of such data.

It is needless to remark that the auditor failed to agree to any such arrangement, but the general manager's proposition placed the thing in a new light. It brought out the indisputable fact that cost records to be of value and free from attack must balance with the general books.

"What do we want cost data for anyway?" suddenly asked the G. M. "I'll bet each one of us has a different reason." The auditor spoke first: "I'm not so much interested in detailed costs and quantities as I am in totals. As long as I can keep my books straight as regards additions to property and retirements of property, and not mix construction and maintenance, I'm satisfied."

COSTS FROM THE CONTROL STANDPOINT

"I need to go further than that," volunteered the engineer. "I want detailed data for estimating purposes and to check against quotations from contractors and firms doing work for us. I need costs and quantities in quite considerable detail to enable me to prepare my monthly and yearly budgets."

"Your needs are important and coincide with mine to a certain degree," said the G. M., "but I go you a step further and will probably surprise you when I say costs are of paramount importance from a control standpoint and you have both overlooked what to me is their major value."

"Control standpoint!" both the auditor and engineer unisoned, "what have we been talking about?"

The G. M. smiled. "To bring out my point, will you both agree that as our cost estimating works out at present we use it mainly for post-mortem analysis? We can very profitably use it to predict or pre-plan with. As an illustration of what I mean, you, Mr. Engineer, can lay out on paper a proposed transmission line, tell exactly the size of copper wire needed to carry a given amount of electrical energy to a certain point. You know in advance what your electrical losses will be and just how far apart the wires must be placed to avoid short circuit. You can figure to within one of the number of poles needed, and just what additional electrical load your generating plant will have to supply. If the generators are not of sufficient electrical capacity to supply the additional energy needed, you can lay out on paper a new generator and tell before a single workman has started its construction just what energy you will get from it; and furthermore, its efficiency. A navigator can lay out his course while in port and follow it on the high seas until it finally takes him into the port of destination. Don't you see it now, the electrical engineer and navigator can tell accurately in advance just what the results of their calculations will lead them to, and by mathematics find out the most efficient design or most expeditious course to follow?"

"Yes, but don't we also use cost data for the same purpose?" spoke up Mr. Engineer. "We make out our cost estimates in advance of a job."

"To be sure you do, and always allow a good margin for contingencies," said the G. M., "and how often do you put in revised estimates when a job is half way along? I would like to see cost data used scientifically to plan a job. By such use we should be able to predetermine methods and results from a cost standpoint as well as we do now from design."

"I see where I have got to change my viewpoint," said the auditor. "My training for years has been along lines of investigation and audits."

"No, I don't agree that you should change your viewpoint in the least, Mr. Auditor, but you can, with considerable profit to yourself, enlarge it. For years your training has been balancing income and outgo, debits and credits, as well as balance sheets for a busy directorate and the treasurer. Physical quantities and their value, labor hours and production per labor hours, changes in methods and ensuing results have made impressions but have been pushed aside for debits and credits and balance sheets."

"You're right, G. M.," and the engineer pounded the table before him. "At the last meeting of our Engineering Society almost an entire session was devoted to lambasting accountants for not revising their ancient methods of cost accounting. Solomon's bookkeepers used the same general scheme when the temple was built that most accountants have today, and like Masonry, it has been handed down intact through the ages."

"I seem to be getting mine at this pleasant little knocker's convention," crisply interjected the auditor. "Well, go as far as you like. I'm here to learn, but Mr. Engineer, don't throw out your chest with righteous indignation and imagine yourself the most abused person on earth. If I recall correctly, you seemed satisfied with things when we started this conflict. Let me say, however, while I have the floor, that under our present method of cost accounting a great part of the accuracy of our records devolves upon your organization. For example, if you can't get your foremen to turn in proper time cards and quantities used, what can my cost clerks do?"

"Righto," came back Mr. Engineer friend. "We have not been as careful or strict as we should have been, but now that the subject is opened up, I'd like to say that my field forces are hired to use tools and not to push pens and pencils. I want to say also that cost reports mean nothing in my pure young life but a check against estimated costs. I haven't the time to study the detail sheets, new estimates require all my attention. I wish we could revise and better our methods of making up estimates so they would be more complete."

"You fellows seem to be working up to the point I am striving for, and that is to reduce the clerical work of our supervisory staff and field forces to an absolute minimum, and at the same time secure the maximum results from a cost control standpoint. To accomplish these two results our cost department must give more attention to its work than ever before, for we will look to it for control. Today the auditing department and engineering department pass the buck to each other whenever a question arises."

The manager reached in a drawer in his desk and pulled out a bunch of estimates, or work authorizations. Turning to the chief engineer, he said: "Here is a job showing a probable expenditure of $8,000 for a new transmission line to the Hurricane Coal Company's property. No doubt the quantities shown are fairly accurate, but what did you base your labor costs on?"

"I presume the superintendent of lines followed his usual custom and guessed so many men for so many days, digging the dope out from the experience file he carries on his shoulders."

"Just so, all right. Now suppose when you first learned that this line was to be built you had given the cost department the size of wire needed, type of insulation, hangers, cross-arms, height of pole, length of line, all on a blueprint, with special reference to any unusual matters not ordinarily encountered, and they had shortly thereafter handed you a complete itemized estimate, what would you do?"

"Say, Boss, I'd throw a fit," the engineer laughed, "and after I had come out of it, I'd say the estimate was crazy and, without wasting time to look it over, have the line department make a real one."

"Well, now, suppose some more," continued the G. M. "Let's assume the estimate was correct, more so than many an overworked superintendent could prepare. Would not such knowledge be of greater value to you than all the post-mortem cost analysis made up?"

THE ENGINEER AND AUDITOR SEE THE POINT

The chief engineer was thinking and thinking hard; he had the light of a new idea in his eyes; even the grizzled old auditor was doing some. The latter was aware of the oft-repeated complaints of his cost clerks that the operating heads did not make use of the carefully detailed and elaborate cost statements issued from their department. It was dawning on the auditor that it was a proper function of the cost department, rather than that of the operating department, to analyze and question.

The discussion between the general manager, auditor and chief engineer gave each one a new perspective. The engineer saw the relation of cost preparation to design. The auditor saw a neglected function, which, properly set in motion, would make his department a greater help in administrative control, and at the same time insure more accurate bookkeeping. The general manager visioned greater operating efficiency and control through direct comparison of statistics prepared by an unbiased, disinterested, organization.

To be sure the engineer wondered if adopting such methods of cost estimating would not result in endless explanations, but the opportunity of securing cost data carefully prepared and showing comparisons offset the thought. He was interested in output per labor hour more than in cost per unit.

The general manager knew a new day in cost accounting was dawning, when methods and results would be firmly bound together, inefficiency in the first quickly shown in the second, where idleness, lost time, inadequate machinery, inefficient working forces, lack of facilities, would show up promptly. He knew that the determination of costs in advance, instead of piling up complications of past results, gave him a better grasp on causes, which is the main idea in control.

It was gradually dawning on the auditor that his cost system was woefully lacking and incorrect in its application, that cost statements were not being analyzed with the idea of reducing wastes, but rather as an index of the guessing ability of the estimator. He understood that before any job could be started somebody had to outline why it was necessary, what was to be used, where it was to be used, when it was to be used, how it would be done. But his job would be to show if the job was warranted in view of its cost, and this big "if" should be known before and not after the work was started.

White Line Shows Swing of Cars

IN THE heavy traffic sections of Youngstown, Ohio, the local police department has had white lines painted on the pavement to indicate the clearance necessary for the swing of the street car platforms. These lines are a great help, it is claimed, in preventing collision of the cars with pedestrians or automobiles. However, in connection with the use of these lines, it is pointed out that they serve simply in the nature of a warning to the driver of an automobile or a pedestrian and help him in making sure that he is in the clear. The presence of the line does not absolutely prevent an accident and in no way relieves the street car man of his share of responsibility.

Selling Rides in a City of 6,000

Interesting Experiment During Nine Months of 1920 in Selling Twenty-five Tickets for $1 at Nelson, British Columbia, Pushed by Woman Chairh Fare Bringing Less Today—High Per- Board of Aldermen—Straight 5-Cent Casman of Street Railway Committee of the centage of Grades and Curves Has a Tendency to Discourage Walking

VIEW OF NELSON ON KOOTENAY LAKE

NELSON, British Columbia, with its population of 6,000 and a street railway of but 2.5 miles route (4 miles single track in all), does not seem at first blush likely to offer any experience in the matter of selling electric railway transportation. Nevertheless, the very fact that no healthy persons in Nelson (and most of them are healthy) have to use the trolley gives point to the experiment made by this municipally owned road. A rather high percentage of grades and curves is about the only thing to discourage walking.

The earliest fare prevalent on this road was the eight-for-a-quarter ticket and 5-cent cash fare in use from 1910 to 1915, no change having been made in rates when the city took over the railway in 1914. In 1916 war increases made it necessary to sell the tickets at the rate of six for 25 cents, and in 1918 the cut-rate ticket was given up for a straightaway cash fare of 5 cents. As it happened, the years 1918 and 1919 were among the most active in the history of the community, with the result that 1918 at 5 cents showed more passengers and revenue than most of the corresponding months of 1917, while 1919 made a still better showing in comparison with 1918, the increase in passengers being from 299,516 to 364,839 and in revenue from $14,976 to $18,201.

However, there was then (1919) on the Board of Aldermen an enthusiastic believer in greater usefulness of the street railway in the person of Mrs. W. Garland Foster, chairman of the street railway committee. While acknowledging that the 5-cent fare had done well, she held the opinion that a twenty-five for $1 ticket would do still better if the right push were put behind the bargain rate. One member of the committee was with Mrs. Foster, another was opposed and a third was a benevolent neutral. When the matter was brought before the municipal council there was strong opposition, headed by the Mayor and by an Alderman who has since succeeded him in that position. However, the plan went through in April, 1920, and was continued to the end of December, 1920. At that time a combination of circumstances, especially the large cost of securing a supply of new tickets, the coming in of a new council and the hope that still larger revenues were possible, led to the return of the 5-cent fare. Mrs. Foster did not object to this decision, believing that time would tell whether the psychological appeal of the reduced rate was or was not as good as she believed. As a matter of fact, January, 1921, shows a drop to $1,512.35 at 5 cents compared with $1,643.95 at 4.66 cents fare in December, 1920. But it

TABLE I—COMPARISON OF LIKE MONTHS OF 1920 AND 1919

Month	Increase in Passengers
January	10,604*
February	6,774*
March	3,275†
April	6,338
May	5,590
June	3,067¶
July	7,738
August	7,633
September	5,880
October	5,482
November	3,930
December	2,043

* Exceptionally good weather; 5-cent fare.
† Last month of straight 5-cent fare.
¶ One car out for repairs three weeks.

may be that the storms of January, 1921, had as much to do with this as favorable weather did with the January, 1920, returns, which were $1,674.50 at a 5-cent rate of fare. In any event, this has been the course of affairs.

COMPARISON OF FINAL QUARTERS

If the first quarters of the years 1918, 1919 and 1920 are ignored because of the unusual January, 1920, noted, it will be of interest to compare the last nine months of the same years. It will then be found that the 1919 period showed a gain over 1918 of 28 per cent in traffic (293,302, against 228,986) and of 10.6 per cent in revenue ($14,668.16, against $11,449.31). Also a comparison of the last nine months of 1920 with the same period of 1919 shows that the traffic continued to rise, namely, from 293,302 to 341,003, or 16 per cent, and that revenue also continued to rise, namely, from $14,668.16 to $15,616.85, despite the fact that 50 per cent of the passengers were paying 4 cents.

TABLE II—PASSENGERS CARRIED, NELSON (B. C.) MUNICIPAL RAILWAY

	1914	1915	1916	1917	1918	1919	1920
January......	......	16,285	18,409	23,872	24,096	23,130	33,734
February.....	20,932	14,964	18,114	21,312	21,649	22,778	29,552
March.......	24,827	15,892	19,817	23,524	24,785	25,629	28,904
April.......	25,552	17,605	19,523	21,581	22,650	25,347	31,685
May.........	26,333	16,809	19,271	23,207	23,553	25,485	31,075
June.........	24,958	18,873	22,839	14,687	25,369	32,022	35,089
July.........	34,634	22,207	26,334	30,368	36,589	43,358	51,096
August.......	31,933	12,945	30,125	30,541	28,690	41,969	49,602
September....	23,087	20,721	24,877	25,452	27,669	33,662	39,542
October......	*	*	*	*	22,728	26,907	32,389
November....	*	*	*	*	17,673	29,021	32,951
December....	*	*	*	*	24,065	35,531	37,574
Total.....	.....	....	...	.....	299,516	364,839	433,193

* Information not available.

RATES OF FARE

Eight tickets for 25 cents and 5 cents cash, 1910–15.
Six tickets for 25 cents and 5 cents cash, 1916–17.
Five cents cash, 1918 to April, 1920.
Twenty-five tickets for $1, and 5 cents cash from April, 1920.
Five cents cash January, 1921.

Obviously, nothing is harder than to draw hard and fast conclusions in a period of changing business conditions. Nevertheless, it does seem from the following Table III that the change to a 4-cent ticket rate resulted in a stimulation of traffic:

TABLE III—RAILWAY EARNINGS, NELSON (B. C.) MUNICIPAL RAILWAY

	1916	1917	1918	1919	1920	1921
January......	$920.45	$1,193.60	$1,204.80	$1,105.45	$1,674.50	$1,512.35
February.....	905.70	1,065.60	1,082.45	1,169.15	1,464.45	......
March.......	990.85	1,176.20	1,239.25	1,268.00	1,429.90	....
April........	976.15	1,079.05	1,132.50	1,260.40	1,676.50	....
May.........	963.55	1,160.35	1,177.65	1,274.25	1,377.40	....
June.........	1,141.95	734.35	1,268.45	1,601.10	1,618.40	....
July.........	1,316.70	1,518.40	1,829.45	2,167.91	2,371.00	....
August.......	1,506.25	1,627.05	1,434.51	2,098.45	2,248.95	....
September....	1,243.85	1,272.60	1,383.45	1,683.10	1,786.40	....
October......	*	*	1,136.40	1,345.35	1,430.75	....
November....	*	*	883.65	1,451.05	1,463.50	....
December....	*	*	1,203.25	1,776.55	1,643.95	....
Total....................			$14,975.81	$18,200.76	$20,185.70	....

* Information not available.

In connection with the decline in rate of increase, it is worth noting that January, 1921, at the full 5-cent rate shows an absolute loss of approximately 3,487 passengers (33,734 passengers in January, 1920, against 30,247 in January, 1921), although it would not be fair to ascribe all the loss to the change in rate of fare.

AN EFFICIENT TOWN MOTHER IS MRS. FOSTER

During the period that reduced fares were in vogue Alderman Foster was also responsible for an up-to-the minute improvement in the pavilion at Lakeside Park, namely, the provision of electric plates, kettles and hot water for picnic parties. An old-fashioned flower garden was also added to help riding, but riding continued to increase even after the close of the park season.

In conclusion, it may be mentioned that Mrs. Foster's interest in street railways was not confined to the traffic or sales department. As a delegate of an organization convening at Ottawa she visited the Ottawa Car Company's plant to get the latest facts concerning one-man car operation, and one of her committee recommendations was "that a weed killer be used on the street railway, and, as the weed killer is poisonous, that the owners of animals in the city be warned not to pasture their animals on the streets." The reference to the use of highways for a grazing common indicates that Nelson is not exactly a crowded community!

Fares and Short-Haul Traffic

Graphical Study of Short-Haul Traffic Under Varied Combinations of Headways and Rates of Fare, Which Have Marked Effect on Gross Revenue of Railway Companies

BY EDWARD A. ROBERTS
Engineer with John A. Beeler, New York, N. Y.

IT IS generally recognized that the rate of fare charged by a city street railway and the headway of service have a marked effect on that part of the company's gross revenue that is received from short-haul riders. The experience of virtually all companies which have raised their fares is that some of the short-haul passengers become pedestrians with each increment of fare, for which an allowance must be made in predicting the revenue that will be received from higher rates of fare. It is the purpose of this article to outline a simple process for indicating the effect of increases in fare on the gross revenue received from short-haul riders under varying conditions.

The first principle to take into account is the value of the short-haul rider's time. He will make a trip on a conveyance only when by so doing he saves enough time to compensate for the fare paid. If he cannot do this, he will walk or at least fail to patronize the street cars. To illustrate, if a man's time is considered as being worth 50 cents an hour, and the street car fare is 7 cents, this man in using the cars must save 7 cents' worth of time, which would be 8.4 minutes over the time required for walking.

The accompanying charts have been prepared to show the gross revenue receivable from each 100 persons who would use the street cars for rides up to 3 miles in length if it resulted in a saving of time sufficient to compensate for the fare charged. Three rates of fare, 5, 7 and 10 cents, four different car headways, two and one-half, five, ten and fifteen minutes, and two values of the car rider's time, 25 and 50 cents per hour are assumed.

The case of 100 persons desiring to take a street car ride of 2¼ miles on a line with a ten-minute headway will first be taken and the value of these people's time will be assumed at 25 cents per hour, and that they are capable of walking at the army rate of speed, 5 ft. per second. The average speed of the street cars will be considered as 10 m.p.h. To walk the 2¼ miles will take 39.6 minutes, while to ride will require 13½ minutes, so that the person who can board a car without waiting will save 26.1 minutes, while the person who has to wait the whole headway, ten minutes, will save 16.1 minutes.

On a 5-cent fare basis the price paid for the ride is equivalent in value to twelve minutes of the passenger's time. In this case the entire 100 people should be attracted to the street car service because of the time saving. With a 7-cent fare and a ten-minute headway, 16.8 minutes must be saved to compensate for the price of a ride. The man who can board a car immediately can afford to ride, but he who just misses one will be 0.7 minute or forty-two seconds better off by walking. If the 100 people are assumed as arriving at the stopping place at regular intervals, say six seconds apart, just seven of them will arrive during the forty-two seconds following the departure of a car, and consequently will fail to save time by riding on the street car. The remaining ninety-three will profit so far as time is concerned by riding, and at 7 cents each will yield $6.51. With a 10-cent fare, twenty-four minutes is required to offset the expense of riding. Direct connection will save 2.1 minutes over the walking time, but the man who has to wait ten minutes for a car would be much better off by walking. Only 21 per cent of the people will in this case find it a satisfactory financial transaction to pay the 10-cent fare.

The point at which a sloping line in the charts starts upward indicates the minimum ride which a person is justified in taking provided he just connects with a car, which would be of course regardless of the frequency of service. The top point of the sloping line shows the minimum ride the person who waits the full interval between cars is warranted in taking. Stated in other words, the top point indicates the maximum distance a person who just misses a car would be justified in walking. The slope of the line bears a direct relation to the headway and is a measure of the doubtful zone in which a person might either walk or ride. The more frequent the service, the shorter should be the walking radius of possible riders.

The accompanying charts have been obtained by following out this process in detail for a number of different cases. The charts show that on the shorter trips the lowest fare yields the most revenue and they illustrate the bad effect of higher fares on short-haul traffic. They further give a definite indication of the relative values of increased rates and show that the total revenue resulting from increased fares is in many cases less than that received with a lower fare.

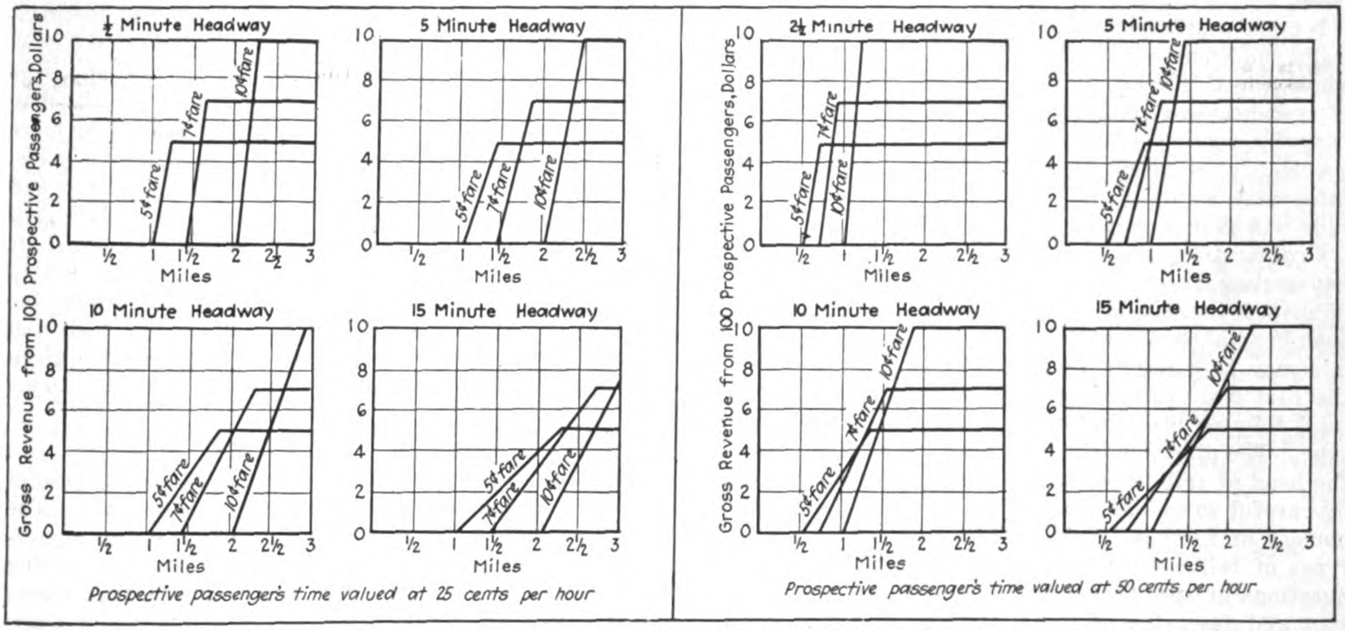
WHAT IS VALUE OF PERSONAL DEAD TIME

It should be noted that the minimum length of trip which a person is justified in taking on a street car does not vary with changes in headway, but depends only upon the rate of fare and the value of the person's time. The data indicated by the charts on this feature are as follows:

	Minimum Justifiable Ride-Miles		
	5-Cent Fare	7-Cent Fare	10-Cent Fare
Prospect's time at 25 cents per hour..	1.03	1.45	2.07
Prospect's time at 50 cents per hour..	.52	.72	1.03

Objection to the method used might be based on the rather far-fetched assumption that each probable rider arriving at a street car stopping place has to know exactly when the next car is due and that he has to go through some sort of a calculation to determine whether he will walk or will wait for a car. This, of course, is not done in detail under actual conditions, but it is a fact that the average person going but a short distance does often make a hasty survey, by looking up and down the street, to determine whether a car is approaching or has just left. This survey causes him either to walk or to ride. Most persons also either consciously or unconsciously put a fairly definite value on their time, and in deciding whether to spend money to save time they are swayed by the personal monetary value of time saved. Furthermore, the person who habitually makes the same short trip realizes very quickly whether the street cars always save him enough time to warrant their continued use. It is believed therefore that the method used for determining the proportion of possible riders that will be customers approximates fairly closely the actual conditions. This method of comparing results to be expected under different rates of fare also provides a good forecast.

The placing of a definite value on the average car rider's time is not at all a simple task, and one person's estimate is about as good as another's. A person's earning ability should, however, not be confused with



Prospective passengers time valued at 25 cents per hour

Prospective passenger's time valued at 50 cents per hour

DIAGRAMS SHOWING COMPETITIVE WALKING DISTANCES FOR VARIOUS HEADWAYS WHEN BASE FARES ARE FIXED AT 5, 7 OR 10 CENTS AND TIME IS VALUED AT 25 OR 50 CENTS PER HOUR

Steel Rails*

Expert Outlines Present Status of Rail Making and Raises Questions as to the Problems Which Have Been Suggested by Extensive Experience in Conducting Special Inspections

BY C. W. GENNET, JR.
Of Robert W. Hunt & Company, Engineers, Chicago, Ill.

THE first T-rail ever made in America was rolled at Danville, Pa., in 1845. Twenty years later the first bessemer steel rails were rolled at the North Chicago mill. It was just as difficult in the early days to obtain satisfactory rails as it is today.

It is estimated that a production of 4,500,000 tons of rail per year for the next five years is necessary in order to put the railroads in proper physical condition and to overcome deferred maintenance caused by the war. There will be difficulty in obtaining any such quantities, owing to the fact that many rail mills have been turned over to the production of other forms of steel.

No doubt rails wear rapidly in various places of heavy traffic and have to be quickly replaced, but, on the whole, there is little question that the general adoption of open-hearth steel has gone a long way toward satisfactorily solving problems of wear that were so frequently raised with bessemer rails. The question of safe rails is now much more important than whether rails will give a year or two more service.

Ordinary figures for failures are not particularly impressive except to the technician. But interpreting published records in a certain way indicates that for open-hearth steel one rail out of every eight hundred laid may be expected to fail and has to be replaced in the first five years of service. Only about half of the total failures are what may be termed of a dangerous type. The others mostly consist of defects occurring in the head of rails, which as a rule can be easily detected by careful surveillance and removed prior to the development of further trouble. Notwithstanding what the types of failures may be, or how prolific they may be, questions of specifications and manufacture are important and deserving of the fullest thought.

UNIFICATION OF RAIL SPECIFICATIONS IS DESIRABLE

There is little use in threshing over the subject of specifications, except in a very general way. The matter is in the competent hands on the one side of the American Railway Engineering Association's rail committee, while on the other side are the manufacturers. The regrettable fact seems to be that the two sides cannot compose their differences, as by arbitration for example, and enable a single specification to be promulgated for general use by all the roads. My criticism of most rail specifications is that they are too broad in certain features and too narrow in certain others, with the result that both manufacturers and consumers suffer aggravating incidents that could easily be prevented. Manufacturers frequently find it difficult to get good steel quickly accepted, and on the contrary railroads are frequently bound to accept what unquestionably ought to be rejected outright.

To illustrate the point, consider for a moment 99-lb. rails for which there are at least four specifications in common use having their low limits of carbon varying by the small difference of four points. If a mill rolling for one customer whose low limit of carbon is 0.63 per cent happens to get a heat showing 0.62 per cent carbon but satisfactory in all other respects, the slight difference of one point of carbon in the specification makes it necessary for the rails, or perhaps the ingots, to be diverted from the original to some other customer. That possibly means allowing the ingots to get cold, later to be reheated and rolled—a performance almost bound to result in inferior practice both in the mill and later on the track. The matter of a few points of carbon, and possibly some other elements, has repeatedly been proved to be quite insignificant in the long run and easily overshadowed by the kind of treatment accorded the steel in the mill. Determination of what constitutes a reasonable minimum limit for carbon, and insistence on such as a standard, the same as 0.04 per cent has been fixed for years as a maximum for phosphorus, would be a great step forward in harmonizing specifications without serious detriment to the users.

Again, specifications lack breadth in the customary clause governing straightening. No doubt the specifications used in 1844 read the same as they do now, namely, that "rails must be straight in line and surface." The result of this requirement is that rails may be strained beyond their elastic limit in twenty or more places by repeated blows in the cold-straightening press, only then to be shipped to a 5- or 6-deg. curve and readily spiked into place. Modern section rails are exceedingly flexible and, providing they contain no short bends or sharp kinks, it would seem practicable to accept them within certain limits perhaps, without the damaging cold straightening now given to each and every rail. Experimental lots of such rails have given fair service and the subject deserves more attention.

THE ITEM OF TESTING IN RAIL SPECIFICATIONS

Most rail specifications are too broad with respect to the testing, both chemically and physically. The chemical composition is invariably obtained by analyzing drillings taken from a small test ingot weighing a couple of pounds and cast while the regular ingots are being poured. There is no prescribed size or shape for the test ingots used by the different mills, nor restriction on whether they shall be cast from the first, middle or last part of a heat. In fact, no restrictions prevail of any moment whatsoever, pertaining either to the test ingots, *per se*, or to the chemical practice that may be later followed in doing the analytical work. The result is that the actual chemical composition reported by the mills for their steel may vary decidedly as between different mills, so that a 65 carbon heat in Colorado may be quite different from a 65 carbon heat in Alabama or Pennsylvania. It should be said in justice that this subject is being investigated and early action is hoped for.

The physical tests do not, as a rule, go far enough to protect against bad or unsound rails being accepted and laid in the tracks, only to be replaced perhaps after a short service. Testing two or three pieces of rails to represent as many as two hundred made from perhaps fifty ingots, each possessing marked individuality, even though from the same heat, is incompatible with the tests prescribed for many other products on whose use hinges no important question of life. A requirement for oil line pipe is that each and every length, in addition to passing a careful surface inspection on both the inside and the outside, shall withstand a prescribed pressure test. Each piece of cast-iron water pipe, whose walls may be an inch thick, must likewise be tested and inspected. And a most odious comparison with the tests on rails is afforded by a recently adopted specification for wrought-iron tie plates, which requires a complete tensile test to be made on one out of every thousand plates, a proportion by weight which if applied to rails would mean something like sixteen tensile tests per heat. The proposed abandonment of the drop test, for years recognized as a standard test for brittleness, and the plan of covering this feature by resort to a measurement for ductility obtained under difficult and uncertain conditions, is regrettable. Granting the importance of ductility for rail steel, the imposition of arbitrarily determined limits for it, the matter of measuring it satisfactorily except in the laboratory, and finally the question of accepting or rejecting rails whose ductility varies by a hundredth part of an inch, is, to my way of thinking, positively dangerous. Would it not be better to waive the question of the ductility of rails entirely, as it was so long an unknown thing, and to devote more study to the definition of "interior defects" and such positive methods for detecting them as would permit of rejecting those rails whose test piece fractures show unmistakable signs of segregation?

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*Abstract of paper read before the Western Society of Engineers, Chicago, Ill.

The manufacture of basic open-hearth steel rails of modern sections is a process fraught with many questions of practice very different from that followed in the bessemer methods of a few years back. The introduction of large furnaces from which a hundred tons of steel is tapped for a single heat, the casting of as many as fifty ingots on a heat, the use of large heavy ingots, and last, but not least, the fact that modern rail steel is sufficiently high in carbon to be easily susceptible to heat treatment, are features so influencing the general process as to make constant attention necessary to matters that in the old days were scarcely present at all. My observations of manufacturing conditions, resulting from the closest of contact with the special inspection of rails at all of the different mills, convince me that many of these often neglected matters are paramount to other details so frequently brought to the front, as, for instance, a few points of carbon. And in this connection permit me to say that special inspection has not only revealed many important incidents that no mill superintendent will condone when his attention is called to them, but it has also afforded opportunity for tracing the history of bad rails in service back to some slighted detail of manufacture no doubt responsible for the failures.

SOME PERTINENT QUESTIONS ON STEEL MANUFACTURE

I regard the manufacture and rolling of rail steel as of more importance than that of any other steel product, and conditions emphasize the necessity of making thorough studies of the various features of present-day methods. Such studies must frequently be based not only on the manufacture itself but on the story that the rails in service may later tell. Records for many subjects are already in hand and time and work are merely required to afford definite information on questions of great value to both railroads and manufacturers. Literature is very weak on many of the subjects that ought to be investigated and discussed. And among the many questions that can be raised I suggest some of the following, pertinent of modern practice and especially appropriate, therefore, for original research and study:

1. Are rails made of steel by the continuous Talbot furnace process comparable with those made by the straight open-hearth method? In the continuous process the furnace is seldom emptied, but a hundred tons or so of steel is tapped every two hours, as against the ten hours of time required to make an equivalent heat in a regular furnace. Is the steel from the rapid working Talbot furnace sufficiently free from oxides and other impurities to afford good, sound rails, and how can such a matter be quickly proved?

2. What effect, if any, on rails has steel made by the Duplex process, wherein highly oxidized metal is added to the open-hearth furnace, sometimes very soon before tapping? How can rails rolled from steel containing excessive amounts of impurities be detected?

3. What effect on rails is produced by recarbonizing the steel in the ladle with coal or coke and then adding cold deoxidizers to the ladle? What is the real effect produced by holding a ladle of steel prior to casting the ingots to permit of time for the chemical reactions to settle?

4. What is the effect on rails rolled from ingots cast with running stoppers and sometimes without any control by the ladle operator? How does the size of the nozzle, pouring temperatures and time required to cast the ingots of a heat influence rails?

5. How soon after casting ingots should they be charged into the soaking pits in order to assure a minimum of piping and segregation? What effects are produced by delays in promptly charging the ingots to the pits, and what is the effect of unduly and rapidly chilling the outside or skin of the ingots?

6. How long a time and under what conditions of gas and air regulation should ingots remain in the soaking pits? What kind of control of the pits is best to insure against overheating or burning the ingots? What is the effect of rolling rails from ingots one side of which has been heated so hot as to show a bright white spot significant of overheating?

7. What effect on rails have different rates of blooming the ingots? In some cases 8-in. x 8-in. blooms are made from ingots in nine passes and in other cases in twenty passes. Some mills work rapidly and others slowly; does this produce any difference?

8. What effect on the grain structure or the life of rails is produced by increasing the number of passes, or work given to the steel, when the ingots are rolled into rail? One mill makes a rail from an ingot 19 in. square in fifteen passes, while another mill makes the same rail from an ingot 24 in. square in twenty-nine passes. Has the average rate of reduction per pass any effect on the life of rails?

9. What matters mostly influence the production of rails showing seams on the surface? Some heats are practically free from indications of seams, while on other heats rolled at the same time seams are abundant.

Signal Tail-Lights for Safety Cars

SAFETY CAR EQUIPPED WITH INDICATING SIGNALS

RED and green tail lights which are alternately automatically cut in, red to indicate power off and green to show power on to the following car, truck or automobile, are being installed on all of the safety cars in Terre Haute, Ind. Seventeen cars have been equipped at the time of this writing and the remaining forty-three cars are being equipped at the rate of four or five a month as they come into the shop for regular overhauling. This signal arrangement was described in the ELECTRIC RAILWAY JOURNAL for Aug. 3, 1918, in connection with its use on cars of the Philadelphia Rapid Transit Company for service to the Hog Island shipyard and on cars of the Cleveland (Ohio) Railway. As the Cleveland cars are single-ended the signal lights are carried at the center of the dash.

Stirling Boiler Improved

Recent Modifications Which Have Been Made in the Design Make for Standardization, Greater Accessibility and More Convenient Setting

SEVERAL changes have been made during the last few years in the design of the Stirling boiler by the manufacturers, the Babcock & Wilcox Company. A side view of the latest type, equipped with a superheater and a chain grate stoker, is shown in the accompanying engraving. Briefly, the changes from the original type can be grouped under seven heads:

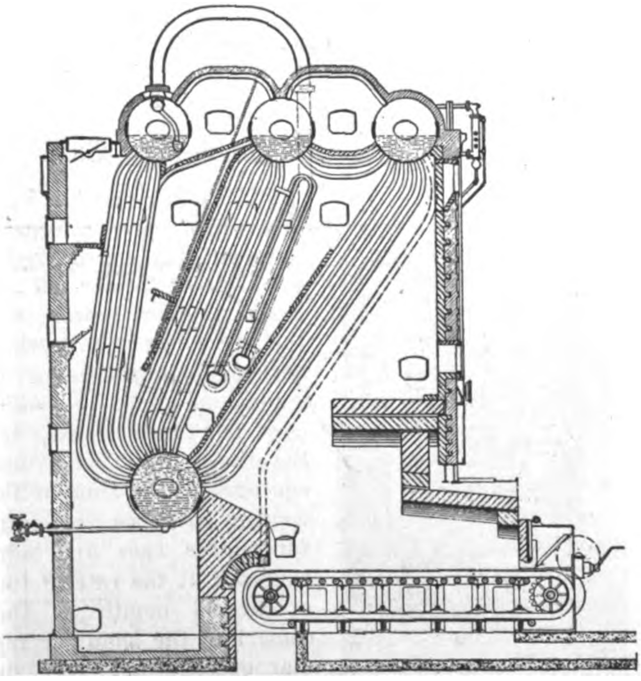
1. All steam drums are now placed on the same level, the steam being taken from the rear steam drum. The primary purpose of this is to reduce priming with concentrated water.

2. Protection of the rear steam drum is given by a baffle carried on the front tube of the rear bank, this tube being expanded into the center drum.

3. The arrangement of the tubes circumferentially on the mud drum is such as to give a larger superheater chamber than before. This permits a greater amount of superheating surface for higher superheat than hitherto has been obtainable and also greater ease of access to the superheater headers and handhole caps.

4. In stoker-fired work, except in the case of stokers of a design that permits of carrying the front boiler wall, this wall is carried on supporting members furnished as part of the standard boiler equipment. Where this front wall is so carried a slip joint between the front boiler wall and that portion of the wall carried on the stoker is used. These features not only definitely fix the responsibility of carrying the front boiler wall but give a front wall construction that may be repaired without taking down the entire wall.

5. Where the size of the boiler wall is such as to make it advisable the use of bonding tile with properly designed supporting members is standard construction in the front wall. This construction, as proved in operation, is successful in overcoming the tendency of the front wall to spring inward.


SECTION THROUGH ONE OF THE NEW CLASSES OF STIRLING BOILERS

6. In the earlier designs, where battery settings were installed, a three-legged center support was standard in the battery wall. In the redesigned boiler the center support has but two vertical members, doing away with this objection.

7. In battery settings special means of access for inspection of the inside mud drum heads is standard in the redesigned boiler.

The studies that have led to the redesigning of the Stirling boiler naturally led to a consideration of the variation between classes and sizes of boilers. This has resulted in an entirely new classification in which the variation between the classes and sizes is simple, logical and progressive. While the purchaser of steam boilers is not primarily interested in methods of manufacture provided proper construction methods are followed, it is, however, the purchaser who ultimately receives the benefit of any improvements in manufacturing methods.

This reclassification will undoubtedly lead to a reduction in manufacturing cost through a reduction in inventory of material that must be carried in the number of standards in use, etc. While the manufacturer of this boiler will offer previous standards to complete plants in which such standards were installed, it is the intention to offer the redesigned and reclassified boilers for all new work.

A. S. M. E. Papers on Boiler Operation and Boiler-Water Analyses

THE results of a series of eleven tests made on a 468-hp. Edgemoor boiler fired with pulverized coal, at the Oneida Street Station of the Milwaukee Electric Railway & Light Company, reveal that the customary specification of pulverizing coal to the extreme fineness of 85 per cent through a 200-mesh screen is an unnecessary precaution. These tests, conducted by Henry Kreisinger, research engineer Combustion Engineering Corporation, and John Blizard, fuel engineer United States Bureau of Mines, and the results of which are printed in the May issue of *Mechanical Engineering*, published by the American Society of Mechanical Engineers, indicate also that completeness of combustion is more a matter of a proper furnace and burner design and of the right way of supplying air rather than of the fineness of the coal. It was also found that undried coal could be burned as successfully as fuel dried to 1 per cent moisture, the only difference being a slight decrease in efficiency which checked closely with the increase in losses due to evaporating the increased moisture in the coal. The best results were obtained when the coal was burned at a rate of 1 to 1.5 lb. per cu.ft. of combustion space per hour.

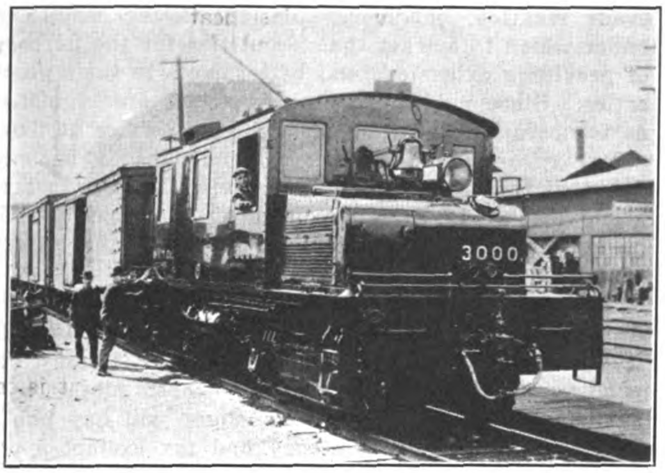
In considering the corrosive effects of boiler feed water, J. R. McDermet, research engineer the Elliott Company, in an article in the same publication states that boilers operating below rating rarely suffer any damage from corrosion from oxygen whatever its content in the feed water. Regardless of the forcing, however, if the concentration of oxygen be kept below one part per thousand by volume pitting action is seldom experienced.

The corrosion of cast iron, in its initial stages, is more rapid than that of steel, but the adhering residue immediately forms a protective coating which arrests further action. Cast-iron economizer corrosion is due to the continuous removal of this protective coating.

New Locomotive for Monongahela Valley Traction Company

THE Monongahela Valley Traction Company has recently purchased a new 50-ton class B Baldwin-Westinghouse locomotive, which is a duplicate of locomotive No. 2,000, installed about two years ago. The new locomotive has just been placed in service.

The locomotive is equipped with four type 562-D-5, 100-hp., 600-volt, field-control motors and double-end HL control. It will be used for general utility haulage, as this company does extensive business on a steam-railroad basis of operation. An important part of the business is the movement of gasoline tank cars from Jackson's mill on the Clarksburg Weston lines to the freight interchange of the Baltimore & Ohio Railroad near Clarksburg.



MONONGAHELA VALLEY 50-TON LOCOMOTIVE JUST PLACED IN SERVICE

The general characteristics of this locomotive are as follows:

Weight	50 tons
Maximum tractive effort at 25 per cent adhesion	25,000 lb.
Normal tractive effort at 9.7 m.p.h., full field, one hour	15,200 lb.
Continuous tractive effort with forced ventilation, short field	9,000 lb.
Maximum trailing load starting on ½ per cent grade	860 tons
Balancing speed, short field, at 600 volts on level with 500-ton trailing load	17.5 m.p.h.
Balancing speed, short field, at 600 volts on 3.0 per cent grade with 200-ton trailing load	10.5 m.p.h.

The locomotive will also be used in conjunction with locomotive No. 2,000 in hauling coal to the Domestic Coke Company plant at South Fairmont, as well as for hauling carloads of slag for ballast work along the railway company's tracks. Freight business on this property has increased considerably, both in carload and less-than-carload movement, the latter being handled on a package-freight basis.

The Spray Gun for Painting

THE firm of W. N. Matthews & Brothers, St. Louis, Mo., is now marketing the Matthews automatic spray gun for painting. This spray gun is furnished in two types, one designed for general painting purposes in industrial and manufacturing plants when quantity production is essential, and for painting large areas, general house painting, etc. With this type of gun the container holding the paint is suspended above the surface being painted and the paint flows to the gun through a hose. The feature of this spray gun is that the air and paint are mixed at the point of the nozzle and not inside the gun. The other type is the jar type, which is especially adapted for use in plants where frequent changes in paint are required. This gun is designed so that the paint is held in a small container which is screwed to the under side of the valve.

Either of these models can be adjusted to produce either a narrow line or to throw a spray of sufficient volume to cover 80 sq.ft. per minute. The air pressure necessary varies from 10 to 80 lb. per square inch, depending upon the character of the paint being used.

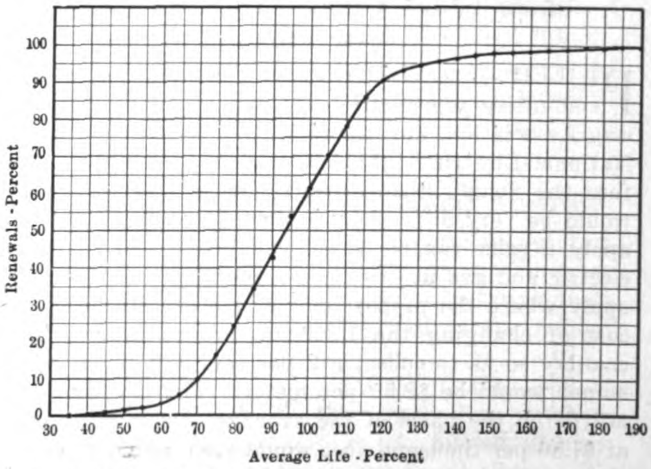
Tie Renewals in Relation to Average Life

RECORDS kept by the Forrest Products Laboratory, Madison, Wis., have shown that there is a general law governing the rate of renewals in all groups of railroad ties, no matter what kind of wood is used in the ties, where they are placed or whether they are untreated or treated with preservatives. These records show a wide variation in the lives of various groups of ties, but a remarkable similarity between the percentages of ties that need replacement at proportionate intervals in the lives of any two groups.

The comparisons are based on forty-three groups, including 42,000 ties of many species, some untreated and some treated. For any of these groups, the percentage of renewals in relation to the percentage of average life is fairly represented by the curve shown.

This curve answers several valuable purposes. It can be used in estimating the average life of a group of ties long before all the ties in the group have been removed, also to show the number of replacements that will be necessary during a given year.

As an example, assume that out of a group of 1,000 ties, 200, or 20 per cent, have been removed at the end of four years. From the curve it will be seen that 20 per cent of a group is usually removed at about 77 per cent of the average life. The average life of this group, then, will be 5.2 years. Further computation shows that the number of replacements to be expected during the fifth year is about 350, the sixth year 300, the seventh 100, and that at the end of nine years practically all the ties in the group will have been removed.



TIE RENEWALS IN RELATION TO AVERAGE LIFE

Thus, with the aid of the curve, it is possible to predict the average life of any group of ties even while most of them are still in service.

American Association News

ASSOCIATION'S PUBLICITY PLAN AS OUTLINED—ENGINEERING AND OTHER ASSOCIATION REPORTS ARE BEING WHIPPED INTO FORM—EXECUTIVE COMMITTEE SELECTS ATLANTIC CITY FOR CONVENTION, WHICH WILL BE HELD IN NEW HALL ADJOINING BOARDWALK

Atlantic City Gets 1921 Convention

ONCE more Atlantic City has been chosen as the location of the annual convention of the association. The 1921 convention will be held during the week beginning Oct. 3. In view of the fact that there are to be no exhibits in connection with this year's convention arrangements have been made to hold the meetings in a new building that has only recently been completed on the Boardwalk at North Carolina Avenue immediately in front of Haddon Hall.

This building has a large convention hall, where the principal meetings will convene, and immediately adjacent thereto are smaller rooms that are to be used for the meetings of the affiliated associations.

The subjects committee has already mapped out a program for the American meetings of extraordinary interest. This will be announced at an early date. The program for the affiliated associations will consist mainly of committee reports and addresses, dealing as usual largely with railway operation. Delegates who attend the convention are urged to come prepared to avail themselves of the especial opportunity that is to be given to enter into a full discussion of the reports and papers on the floor of the meeting.

The usual arrangements have been made with the Hotel Men's Association for accommodations and those who are planning to attend should make their reservations at an early date.

Full details as to the program and other matters of interest pertaining to the convention will be published from time to time as they are completed.

Sales Taxes Uncollectible on Urban Car Fares

PHILLIP H. GADSDEN, chairman of the joint tax committee representing the American Electric Railway Association, the American Gas Association and the National Electric Light Association, in a statement before the Senate finance committee on May 10, said it would be very difficult, and almost an impossibility, to apply a sales tax on street car fares. So far as the electric and gas utilities are concerned, the same would apply where the prepay quarter meters are used. The cost of changing the 1,250,000 prepay meters in the country so as to collect a 2 per cent tax from the consumer would be $2.50 per meter. The tax that would accrue on the basis of the average consumption of gas at $1.50 per thousand feet would yield only 37½ cents to the government per annum. In other words, to collect the tax these utilities would have to make an investment of about as much as the government could collect in taxes in seven years.

A revision of the federal tax laws to preclude the issuance of tax exempt government securities so as to enable regulated industries to dispose of their securities was also declared vital to the utilities.

Mr. Gadsden said that public utilties did not seek to evade taxation, but merely desired better conditions under which to market their securities for the purpose of providing extensions and betterments to their properties. Since public utilities as a class are regulated as to operation and compelled to give service at fixed prices regardless of economic conditions it is only fair that they be considered as a separate class in taxation legislation. The appointment of a special subcommittee to make a thorough study of the public utility tax situation was urged.

Two features of the securities situation which were declared vital to the continued operation of public utilities are: Persons upon whom public utilities must depend very largely for new money—those subject to a surtax of over 3 per cent—no longer will buy public utility securities, because they find tax exempt 5 per cent government securities better investments.

The only persons who, under the present tax laws, find it profitable to buy public utility securities are those whose incomes are less than $10,000 a year. Their combined savings are only $116,000,000, or about $1,884,000,000 less than is required by the public utilities, including steam railroads, electric railways, gas, electric light and power plants, annually to make their betterments and extensions.

The most serious question which confronts public utilities is their inability to secure the new capital required annually in competition with tax exempt municipal securities.

Under the law public utilities are limited to a return on their investment of not over 8 per cent. Unless they can pay over 8 per cent they cannot compete with exempt municipal and state securities.[*] The result of this situation is that inevitably these extensions and betterments cannot be made. Service will slow down and become unsatisfactory and there becomes a growing demand on the part of the public for the acquisition of these utilities by municipalities on the ground that they could borrow money at not over 5 per cent. In other words, while the political policy of this country is firmly and definitely opposed to municipal and government ownership of utilities the taxation policies of our government are forcing it whether it is wanted or not.

Unless the policy of exempting municipal securities is discontinued we are rapidly drifting into practical socialism, which in its essence means ownership of everything by the public.

What is the answer? First, follow the advice of Secretary Mellon in his recent letter to the chairman of the ways and means committee and forbid further issuance of tax exempt securities. This, however, will fail to relieve the present public utility situation. It is estimated that there are $14,000,000 of tax exempt securities now outstanding. If the public utilities are to develop as they should there must be some relief from discriminatory burdens of taxation as it affects the investor. This position must not be misunderstood. The public utility companies are not themselves asking for any relief in taxation, for they propose to pay their full measure of taxation, but they think some plan will have to be devised by which their securities can compete successfully with those already under tax exemption laws.

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[*] This estimate is based on a computation of interest rates, which included, among its factors, the risk involved and the effect of the Federal income taxes. Public utility capital was considered as having been raised on the usual ratio of bonds and stocks.—[EDS.]

What Is the Association's Publicity Plan?

UNDER date of May 5 President Gadsden addressed a letter to all member companies, asking for contributions to support the publicity work being carried on at the association's headquarters under the direction of the committee of publicity. In his letter he states that the audit of the books of the association has progressed far enough to make it clear that a special assessment will not be necessary, for the obligations of the association can be met out of current receipts without its work being curtailed. Since the defalcation was discovered publicity work has proceeded along the lines laid down by the Committee of One Hundred and the results to date more than justify the belief of the publicity committee that much good can be accomplished by its plan. Continuing, he said that at his request the publicity plan of the Committee of One Hundred for future work and any action looking toward financial contribution to carry on this publicity had been deferred until it was determined whether it would be necessary to call upon the membership to make up deficits accruing on account of the recent defalcation.

Now that such an assessment is not necessary, the committee proposes to carry out its original plan. President Gadsden believes that the great importance of carrying on the proper sort of publicity is realized and therefore urgently requests that all members give the program their closest attention and co-operation.

WHAT THE PLAN IS

With a view to obtaining a better public understanding of electric railway problems, the Committee of One Hundred, co-operating with the publicity committee of the American Electric Railway Association, opened on Jan. 1, 1921, an advertising section in the association offices, New York.

The functions of the advertising section are: To offer free suggestion, advice and counsel to electric railway companies on their advertising and publicity problems; to prepare for local distribution, car cards, leaflets, booklets, newspaper advertisements and other advertising material; to prepare bulletins on the electric railway situation for the use of public speakers, for distribution by bond houses, investment bankers and other institutions engaged in the sale of electric railway securities, and for utility managers to use as good will promoters; to issue to the press statements, news stories, speeches and articles of interest regarding the industry; to co-operate with state and national public utility information committees; to act as a general clearing house between electric railway companies for the dissemination of advertising and publicity material; to make engagements for widely known speakers before national conventions and other large gatherings for the discussion of electric railway problems, and to co-operate with these speakers in seeing that they obtain correct facts upon which to base their addresses and that their remarks receive proper distribution; to study the motion picture field in an effort to adapt it to use as an electric railway advertising medium.

RESULTS TO DATE

Since the advertising section has been opened more than a million copies of leaflets containing constructive facts calculated to inspire fairer treatment of electric railways have been distributed through local companies.

Co-operation has also been manifest with newspapers, for hundreds of columns of news material have been printed. Among the items covered have been the condition of the electric railways nationally; the financial needs of public utilities; financing and refinancing of electric railways; wage reductions.

The section has also prepared and distributed to the member companies a summary of references to electric railway legislation suggested by the Governors in their annual legislative messages and car cards summarizing the findings and recommendations of the Federal Electric Railways Commission.

It planned and helped to carry out National Electric Railway Day, May 4, 1921, which resulted in driving home through parades, motion pictures, display advertising and newspaper stories, varying in length from 600 words to a column and a half, the lesson of increased efficiency of electric railways and low charges for service.

In addition the section has through its chief, Labert St. Clair, aided by advice and suggestion many local companies in making special campaigns.

MATERIAL NOW AVAILABLE

The section now has ready for distribution two leaflets, a booklet, wall cards, etc. A textbook on electric railway advertising is in preparation and will be sent out as soon as it is off the press. This book tells how to advertise electric railways through every known channel. It discusses in understandable language newspaper advertising and publicity, car cards, leaflets, letters, company sections, public meetings and the many other mediums through which electric railways can sell their service to the public.

Pending the financing of the activities of the advertising section there has been a nominal charge for certain of the leaflets enumerated above, but when the financing plan is completed all the literature as well as service will be supplied gratis.

Committee on Safety Holds Final Meeting

ON MAY 10 the Joint T. & T. and Claims Association Committee on Safety held its final meeting at association headquarters and approved a tentative draft of the report which is to be presented at the annual convention.

Those present were E. C. Spring, Lehigh Valley Transit Company, and R. E. McDougall, New York & Harlem Railroad, co-chairmen; H. O. Allison, Beaver Valley Traction Company, proxy for W. H. Boyce; A. J. Van Brunt, Public Service Railway, proxy for H. V. Drown; E. M. Walker, Terre Haute Traction & Light Company; W. F. Weh, Cleveland Railway, and L. H. Palmer, United Railways & Electric Company of Baltimore, sponsor for the committee.

The report speaks of the necessity of some concerted action in public safety work not alone by the street railways but in co-operation with other civic bodies and local industries affected by the dangers existing in the communities.

The committee has mapped out a plan of co-operation whereby it is hoped effective results can be obtained to decrease the volume of accidents. That there is need of such an effort is reflected in the analysis of the replies to the questionnaire sent out by the committee.

Large Attendance at Equipment Committee Meeting

THE equipment committee of the Engineering Association held a two-day meeting at association headquarters in New York City on May 4 and 5. The several sub-committees discussed their particular subjects on the first day and formulated recommendations which were made to the entire committee which assembled on the second day. Those present were Daniel Durie, West Penn Railways, chairman; W. S. Adams, the J. G. Brill Company; H. A. Benedict, Public Service Railway of New Jersey; R. H. Dalgleish, Capital Traction Company; James C. C. Holding, Midvale Steel & Ordnance Company; H. A. Johnson, Metropolitan West Side Elevated Railway; T. R. Langan, Westinghouse Electric & Manufacturing Company; F. H. Miller, Louisville Railway; E. D. Priest, General Electric Company; F. W. Sargent, American Brake Shoe & Foundry Company; C. F. Scott, General Electric Company; Karl A. Simmon, Westinghouse Electric & Manufacturing Company, and C. W. Squier, ELECTRIC RAILWAY JOURNAL. In addition to the regular members of the equipment committee, R. W. Steigerwalt represented C. F. W. Rys of the Carnegie Steel Company, and W. H. Phillips, R. D. Nuttall Company, and N. B. Trist, Carnegie Steel Company, were present at the invitation of the committee to assist in developing standards which the committee is considering.

Proposed additional standards for brake shoes, brakeshoe heads and brake-shoe keys were discussed at considerable length, and it was the general opinion that all dimensions except the radius for the face contour could be properly standardized at this time, this radius to be specified by the customers to suit the diameter of wheel used. The tread and flange contours as presented by last year's equipment committee appeared to be satisfactory, and this year's committee considers it inadvisable at this time to add to the list, as it thought the present number should take care of all requirements.

In regard to a standard wheel contour for cast-iron wheels, the committee felt that a progress report was all that could be presented this year as the thickness in flanges of cast-iron wheels differ to such an extent from steel wheels that it would necessitate changing other standards which had already been adopted. The proposed specification for carbon-steel wheels was discussed and changes were recommended which will bring this into agreement with that of the American Society for Testing Materials.

The sub-committee on car arrangement and design presented a very exhaustive written report for consideration. This is to be reviewed by various members before next meeting and reported on with any additional suggestions or comments.

The sub-committee on life of wearing parts has obtained satisfactory information from fourteen properties, and additional information is expected from six others. The equipment committee expects to include in its final report comments on shop practices and methods which would aid in increasing the life of wearing parts as it is felt that greater publicity in regard to this matter is desirable.

The sub-committee on direct-current lightning arresters reported that a questionnaire had been sent out to 225 properties and so far replies have been received from but thirty-five. From the replies received it develops that lightning conditions appear to be the most severe along the Ohio and Mississippi Valleys.

Specifications for gears and pinions were discussed and it appears that the present association specifications can be brought into agreement with that proposed by the American Gear Manufacturers' Association without much difficulty, and an effort will be made to accomplish this. A revision of the specification for heat-treated axles and similar forgings is not to be attempted this year.

A report was presented showing the results of a test on wheels in service with a curved contour, and it appeared from present results that this type of contour tends to produce excessive wear on the flanges and is not desirable. A general outline was given of the report which is to be presented on the design of a typical shop building. Various suggestions were made for additions, and it is evident that this report will be very complete.

Reports on Power Blocked Out

AT THE meeting of the Engineering Association committee on power generation, held in New York City on May 11, reports of sub-committees were discussed. Of the four topics assigned the following dispositions were made: A form of contract for purchase of power, progress report only; comparative costs of steam produced from different fuels, the preparation of a non-statistical summary of the factors involved was approved for inclusion in the report; progress on the super-power plan outlined by W. S. Murray at the 1920 convention, to be covered in a digest of the forthcoming government report, with suggestions regarding relation to electric railways; on multiple-unit automatic substation, a lengthy illustrated paper was tentatively approved for inclusion in the report.

The meeting was attended by A. B. Stitzer, New York City, chairman; L. D. Bale, Cleveland, Ohio; H. E. Davis, Utica, N. Y.; G. W. Saathoff, New York City; L. R. Shattuck, New York City, and H. B. Reynolds, New York City.

The container idea in transportation is making considerable headway in the steam railroad field. One of the latest developments is that which is taking place on the New York Central Railroad, which has experimented with the plan on a considerable scale and is now having manufactured a number of container equipments. The New York Central's "express" type of car for this service is 55 ft. long, so fitted that it can be incorporated in a standard passenger train. It carries nine steel containers, 9 ft. wide by 6 ft. long, with an inside clear height of 7 ft. 4 in., and a door 3 ft. x 6 ft. They are made as nearly burglar and fire proof as possible, are weather-tight and have a carrying capacity up to 3 tons each. They have wood floors and special attachments for convenient lifting and handling. The freight-train type is provided with containers of two sizes, 14 ft. and 7 ft. long, respectively, so that two large and two small of the removable sections fit on a 50-ft. freight car.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Detroit Strike Averted

Amalgamated Officials Place the Wage Issue Squarely Before Men in That City

After a period of bickering lasting since last December, platform employees of the Detroit (Mich.) United Railway in Detroit voted on May 6 to adopt the Cleveland plan of wages offered by the Detroit United Railway which was rejected almost unanimously a week previous when a strike was voted. A new agreement to be enforced for one year will be arranged for between representatives of the men and company officials.

Besides the reduction to the new scale of 55 cents, 58 cents and 60 cents for Detroit city employees and to a new scale of 53 cents, 56 cents and 58 cents for employees in other southern Michigan cities, the terms of the new agreement vary from the old one regarding overtime. Under the new agreement time and one-quarter will be allowed for time over eight hours with time and one-half for overtime on Sundays and holidays. Under the former agreement time and one-half was paid for all overtime.

FORMER DECISION REVERSED

The strike, which was first voted by the men to be effective on May 1, was postponed for one week when President Mahon made a seven-day agreement with the company with a view of again submitting the matter to the men. The president considered the proposed strike suicidal at the present time and a sacrifice of the union.

The vote followed a final mass meeting of the men employed on the Detroit city lines, held Wednesday evening, when the union leaders summed up the situation and without recommendations put the matter squarely up to the men to decide whether or not the proposed cut in pay would be accepted or a strike called. The further mass meetings had been called by representatives of the men because it was believed that the men had not clearly understood the situation when they voted to strike in case the company would not renew the existing agreement as in force for the last year.

The outlining of the industrial situation throughout the country by W. D. Mahon, president of the Amalgamated Association, and the presentation of facts concerning wage reductions in other cities, are reported to have had considerable influence with the men in bringing about the final result.

Many of the employees changed their attitude regarding the proposed wage reduction when it was announced by the municipal street railway commission that the same wage scale as proposed by the Detroit United Railway or 55 cents, 58 cents and 60 cents an hour was to be put into effect on the municipal lines on May 1. The Detroit United men had counted upon having the moral support of the wage scale of 70 cents, 73 cents and 75 cents being continued on the city lines, but the announced cut on these lines was believed by both officials of the company and of the union to have been influential in averting the threatened strike.

The city employees had voted to follow the example of the Detroit United Railway employees in the event of a strike, and thus the company and the city were in the same position in the effort to reduce wages. The men also believed that the company was more thoroughly prepared for a strike than on previous instances.

The referendum was taken Friday to decide whether the men would strike, accept the 55-cent, 58-cent and 60-cent wage scale offered them by the company, or accept the 50-cent, 55-cent and 60-cent wage with the privilege of arbitrating the whole matter later.

Small Town Folk Should Study the Case of Bowling Green

Folks in small towns where the existing electric railway is fighting for its life are admonished to beware by the Savannah (Ga.) *Press* lest they inherit a pile of junk. The lesson which this paper draws is taken from the experience of Bowling Green, Ky. The *Press* said recently:

> Bowling Green, Ky.! That's the place! It doesn't look big on the map. Even in the census reports, it is said to consist of only 15,000 people.
>
> But one in every three of those 15,000 owns an automobile. Nice little town. What?
>
> Every automobile has at least two seats. some have four or five. Some seven. At a fair guess there is more than one seat each for every inhabitant of Bowling Green. So the whole town could go riding at one time if a strenuous effort were made.
>
> Yet there are such things as pedestrians in Bowling Green. Even people that own cars walk sometimes. One of them recently walked into a street car. Possibly the motorman was dozing. In a town where every third man owns a car and the other two ride with him, there is not much left for a motorman to do. Anyway, the street car business was bad in Bowling Green and when the injured pedestrian sued the company and got a substantial verdict, the railroad magnates decided that the game was no longer worth the candle. So they threw up their hands and surrendered their cars, rails, crossties, franchises, etc., in satisfaction of judgment.
>
> Of course, they might have gone before the Railroad Commission and obtained leave to raise their fares so as to get the amount of judgment out of their few remaining passengers. But the harder they squeezed, the fewer would be their passengers.
>
> Whatever may have been the process of reasoning, the company quit. And the unfortunate plaintiff got, instead of a fat check, a pile of junk.

Blanket Franchise Discussed

Readjustment Essential to Preservation of Value of Railway to the Community

Preliminary discussion of the proposed blanket franchise submitted by the Virginia Railway & Power Company, Richmond, Va., was held recently by the committee on streets. Assistant City Attorney George Wayne Anderson and Directors Sayville and Trafford pointed to safeguards that must be thrown around the city's interests before such a franchise can be granted.

Chairman Puller advised the employment by the city of expert advisers in connection with the franchise discussion. The committee adjourned without action.

Colonel Anderson pointed out that the tentative draft now under discussion took many powers from the city and vested them in the state corporation commission. Director Sayville suggested, in lieu of the 8 per cent return asked for by the company, a sliding scale which would be an incentive to the company to give improved service, and upon which the rate might be fixed from time to time. If the city is to regulate the fare on a valuation, he thought a 6 per cent return would be sufficient to begin with, leaving the company the right to go higher if by better transit conditions it could then earn more, and that means should be provided for a reduction in fare if conditions justify it.

He urged that there must be an incentive to the company to give service, which it would not have on a guaranteed return on its investment as shown by a valuation. Mr. Trafford favored the employment of competent experts to make a valuation. Colonel Anderson questioned the wisdom of paying large sums for experts, and said that the committee, assisted by the department heads, could formulate a franchise acceptable to all. He would accept as the valuation for rate fixing the return made by the company to the Corporation Commission for taxation purposes.

Wage Cut for Track Men

A wage reduction affecting the unskilled laborers on the Washington Railway & Electric Company, Washington, D. C., was recently put into effect. The cuts range from 20 to 40 cents a day and will mean a substantial saving for the company. The readjustment puts recently acquired track men, who were hired at a lower figure than those already in the employ of the company, on the same basis. The wage reduction does not affect skilled workers or trainmen.

Men Ignore Union Officials' Warning

Strike in Akron Repetition of Old Story of Unreliability of Promises from Union

Eleven hundred employees of the Northern Ohio Traction & Light Company, Akron, Ohio, went on a strike Thursday, May 5, following the vote rejecting arbitration. The action was taken in the face of a threat by Patrick J. Shea, representative of the Amalgamated Association, that the charters of the four local unions on the lines of the company would be forfeited.

At the close of the first day of the strike, Mr. Shea went to Detroit to confer with W. D. Mahon and members of the executive board of the National Association. The executive board wired the presidents of the four locals to return the men to work and submit the question of the 15-cent wage reduction to arbitration.

Another vote was taken and the men refused arbitration for the second time. Mr. Shea then returned to Akron and held a conference with officials of the company. He asked if the company would agree to take all the men back to work and submit the wage reduction to arbitration. The company took the position that it would not deal with the radical leaders who were instrumental in calling the strike. The company also took the position that it would not agree to the appointment of the third arbitrator by the Governor of Ohio as was suggested. After a second conference the company agreed to take back all of the men if the 15-cent wage cut was accepted.

Mr. Shea and other representatives of the Amalgamated Association attended meetings of the men Sunday and Monday at which time a secret ballot was taken on the question of arbitration. The first local to vote was the men on the Akron-Bedford-Cleveland Division. These men voted for arbitration with the string attached that either the Governor of Ohio or Mayor Herman Witter of Canton was to name the third arbitrator. The company refused to accept the proposal on the ground that the Ohio Governor was prejudiced in favor of labor organizations and that Mayor Witter of Canton is a union official. That was the situation in the strike up to Monday night.

In the city of Akron, buses and automobiles are taking care of the traffic fairly well; in Canton and Massillon the situation is considerably worse and thousands of persons have been compelled to walk to and from their work.

The public attitude with the possible exception of Massillon, where there is a Socialist Mayor, is decidedly favorable to the company. In the city of Akron, the company has received hundreds of applications for work from local residents. In addition to that many applications have come from Cleveland, Canton, Massillon, Dover, Youngstown and other cities throughout northeastern Ohio.

After the return of Mr. Shea from Detroit nothing was said by the Amalgamated relative to the revocation of the local charters.

The striking employees planned to return to work Thursday, May 12, following an agreement reached on May 10. The strikers voted on May 11 to approve the settlement. The settlement provides the men shall return to work at the proposed reduction of 15 cents an hour, pending arbitration. It is agreed that the company shall select one arbitrator, the employees one, and the Governor of Ohio, together with a man named by the company, shall choose the third arbitrator.

The points to be arbitrated are the hourly wage rate to be paid after May 1; the minimum work-day hours on interurban divisions; the maximum work-day hours on interurban divisions and the merit and demerit system of discipline in regard to Akron, Bedford & Cleveland and the Akron, Kent & Ravenna divisions. The company has named Charles Currie as its arbitrator. The first session is to be held within five days and the finding of the board is to be retroactive to May 1.

Men Reject New Orleans Wage Cut

The wage scale in the two-year contract under which the motormen, conductors, track workers, pitmen and carhouse employees of the New Orleans Railway & Light Company, New Orleans, La., are now working, is to be materially reduced. Under the contract with the Amalgamated Association the scale may be readjusted on July 1, 1921, when the first year of the agreement expires, upon sixty days' notice given by either party to the contract.

Receiver O'Keefe, it has developed, sought to bring about a reduction in the pay of the men and to this end has addressed a communication to the union. Neither the union officials nor the receiver will discuss for publication the extent of the proposed wage cut.

At a meeting of the union employees held on May 6 the wage cut of the receiver, reported to be 13 cents an hour, was unanimously voted down.

If the proposed wage change be not effected by May 16, a provision in the contract stipulates that the wage question shall be submitted to arbitration, both sides to be bound by the findings of the arbitrators.

In discussing the matter the receiver said:

> As the present wage scale was fixed last summer during the peak of high prices, and as the cost of living has been and is still coming down, I felt that it was proper to effect a revision of wages before July, 1922, unless the wage scale shall be readjusted by notice given not later than May 1, 1921. I have accordingly given the notice required.
>
> I have to pay track and other common labor 43 cents an hour, while the city contractor is doing similar work with the same type of labor at 25 to 30 cents an hour.
>
> Annual revision of wages is provided in the contract and upon failure to agree arbitration follows. The question, therefore, will be settled in an orderly manner as the parties have agreed upon in the contract.

City Must Perform Purchase Contract

Federal Court Upholds Puget Sound Company's Appeal for Specific Enforcement of City Contract

In a memorandum handed down in the Federal Court at Seattle, Wash., Judge E. E. Cushman denies the motion of the city of Seattle to dismiss the suit of the Puget Sound Power & Light Company to enforce specific performance of the city's contract for the purchase of the railway system from the power company for $15,000,000.

The complaint, which the city moved to have dismissed, would also prevent any taxpayers from suing the power company in the Superior Court, or in any court other than the United States Court of this district. The suit of the Puget Sound Power & Light Company was filed in February following a suit in the Superior Court brought by a number of taxpayers seeking to prevent the city from payment of gross revenues of the railway into a special interest fund, until the expenses of maintenance and operation had been paid.

The Power Company was not named as a defendant in this suit. It immediately brought suit in the Federal Court and obtained a temporary restraining order to prevent the city from using any of the revenue in the interest fund for any other purpose than the payment of interest on the $15,000,000 bonds.

The taxpayers in the Superior Court obtained a temporary restraining order against the city treasurer that prevented him from paying the gross revenues of the line into the interest fund, but this was dismissed on hearing, and the money for the March, 1921, payment was forwarded to New York. On Feb. 21 the temporary restraining order was obtained by the power company in the Federal Court to prevent diversion of the gross revenue of the railway to any fund until after the interest on the bonds was paid. The affidavit of the city treasurer setting forth the payment of the money was used by the city in its motion for dismissal in the Federal Court case.

In his decision, Judge Cushman said:

> There doubtless is a question as to the propriety of considering the showing made by the affidavit on a motion to dismiss the bill; but, if the cause has become entirely moot by the payment of the installment of interest due on March 1, in the interests of the public and the court it would be the latter's duty to consider such a question at any stage of the proceeding, however presented or suggested, and if it is certain that only a moot question remains to dismiss the suit in order to devote the time and effort which would be required for its consideration to other public business.
>
> Upon the motion to dismiss the defendants contend that there is an adequate remedy at law; that the questions involved have become moot because of the payment March 1, after the institution of this suit, of the interest then falling due. They further contend that no duty devolved upon the defendant city of Seattle to set aside and create, a calendar month prior to March 1, a special fund to meet such interest.
>
> Logically the last contention should be first considered for, if the defendants are right in that, it obviates any necessity for considering the other questions.

Ohio Interurbans Announce Wage Cuts

Arbitration of the wage differences between trainmen and the Cleveland, Painesville & Eastern (two divisions) and the Eastern Ohio Traction Company (two divisions), two interurban companies operating into Cleveland, will begin within the next ten days. Both these roads now pay their men 55 cents an hour for the first three months' service; 58 cents an hour for the next nine months and 60 cents an hour thereafter. Some time ago trainmen on these two lines were notified that the financial condition of the roads and general business conditions would make it necessary for the company to reduce the trainmen 12 cent an hour in each classification. The men refused to accept the cut and arbitration is to result.

Motormen and conductors employed by the Ashtabula Rapid Transit Company have had their pay cut, starting on May 1, from 45 cents an hour for the first four months, 47 cents an hour for the next eight months and 60 cents an hour after the first year, to 40, 42 and 45 cents an hour.

No definite settlement has as yet been reached between the Cleveland, Southwestern & Columbus Railway and the trainmen, who have so far opposed the company's announced wage reduction of 20 per cent.

Legislative Committee Finds Railroad Commission Efficient

The investigating committee of California Senators and Assemblymen, organized to report upon the recent complaints against the State Railroad Commission, has submitted its findings. Though some errors were found to have been made by the commission the committee claims the commission's record of efficient service is an enviable one. It is believed now that all misunderstandings have been cleared and co-operation between the people and the utilities and the utilities and the commission will be the result of the public hearings during the months of January and February at Sacramento, San Francisco, Los Angeles and other important centers of the State where protests against the commission were very strong.

In its finding the committee lays special stress upon the effect on the public mind of the abrogation of contracts existing at the time of the passage of the public utilities act. Though many contracts were abrogated by the commission the committee finds that the commission acted wisely and that failure to enforce the theory would have worked a hardship on certain consumers, for it is a sound principle that "all" consumers receiving the same class of service should be compelled to contribute alike to that fair return." The committee believes that a standard form of contract for service should be formulated by the commission to contain a provision showing that rates therein set forth are subject to change by the commission.

The committee further recommends that all literature relating to the sale and advertising of the stocks, bonds, etc., of any public service corporation be supervised by the commission and that nothing in that literature be permitted which can be construed by the public as being an indorsement or guarantee of the securities by the commission. The committee finally recommends that the commission more strictly enforce the penalties provided by the public utilities act and of the rules of the commission more particularly with regard to overcharges for extensions and service.

Navy Secretary Guest of Britton I. Budd

When Edwin Denby, Secretary of the Navy, went to Chicago on May 2 for the purpose of inspecting the Great Lakes Naval Training Station, he and party were taken to the naval station from Chicago and return on a special train of the Chicago, North Shore & Milwaukee Railroad as the guest of Britton I. Budd, president.

BRITTON I. BUDD AND SECRETARY OF THE NAVY DENBY AT GREAT LAKES NAVAL TRAINING STATION

The train carrying the party was made up of three diners with a car of boy scouts attached. Luncheon was served en route and the cars then converted into chair cars for the remainder of the north-bound ride and the return trip.

Among other prominent men in the party were Captain D. W. Wurtzbaugh, commandant Great Lakes Naval Training Station; General John A. Le Jeune, commanding officer United States Marine Corps; Mayor William Hale Thompson; C. R. Francis, Commissioner of Public Works, Chicago; W. H. Finley, president Chicago & Northwestern Railroad; Fred Upham, treasurer Republican National Central Committee, and Wythe Denby, brother of the Secretary.

On returning to Chicago in the evening the Secretary attended a reception in his honor at the Union League Club which was conducted under the direction of Mr. Budd as general chairman of the club's public affairs committee and John Benham, vice-president of the International Register Company, as chairman of the sub-committee on army and navy entertainment.

Co-operative Benefit Association Organized

Employees of the International Railway, Buffalo, N. Y., have organized the I. R. C. Co-operative Benefit Association, patterned after the Co-operative Welfare Association of the Philadelphia (Pa.) Rapid Transit Company. Herbert G. Tulley, president of the International, which now is being operated by the Mitten Management, Inc., says a number of employees recently asked the company to assist them in obtaining insurance protection under the group plan, and out of the suggestions presented the management has caused the organization of the new association.

Every employee of the company who has been in service six months or more is eligible to membership and will have the opportunity to obtain a life insurance policy for $1,000 and to participate in the sick benefits. The dues are $1 a month and for every dollar paid in by the members the company will contribute an equal amount.

President Tulley explains the principal object of the new organization is to promote true co-operative effort between the management and employees. The affairs of the association are to be managed by a board of trustees consisting of members elected from the various departments of the company. One-half will be chosen by the members and the other half appointed by the company.

Wages Cut Pending Arbitration

Pending a wage settlement before a board of arbitration the East St. Louis & Suburban Railway and the East St. Louis Railway on May 1 reverted to the wage scale that was in effect prior to May 1, 1920.

The receivers of the Alton, Granite City & St. Louis Traction Company, which includes the Alton city lines, have notified the employees that wages will revert on May 15 to the scale in effect prior to May 1, 1920. The number of employees on all the lines mentioned is about 550.

The interurban employees, who have been receiving 59½ cents an hour, are reduced to 53 cents. They have asked for an increase to 85 cents. The city line men have been receiving 70 cents an hour, and are reduced to 46 and 50. They have requested an increase to 90 cents.

The board of arbitration is composed of C. E. Smith for the companies and Hunter B. Keigh for the employees, with the third arbitrator still to be selected.

Third New York Wage Arbitrator Chosen.—Former Supreme Court Justice Arthur E. Sutherland, Rochester, has been chosen third member of the board of arbitration to settle the differences which have arisen over wages between the New York State Railways and its employees.

Toledo Feeling Its Way

Commissioner Wilfred E. Cann at Toledo received a rebuff at the hands of the City Council when it refused to eliminate the Indiana line as he had requested in order to relieve the city system of one costly parallel line.

Progress is expected to be made on a power rate and in wage negotiations within the next two weeks. The wage contracts expired on April 1. They have not been renewed, but the platform men have not received any cut in wages.

During April the railway revenues fell off more than $300 a day over the March revenues and they were more than $300 a day less than February revenues.

The stabilizing fund fell below the fare increase mark when reports were made on May 10. However, the ordinance provides that the fare shall remain at the 6-cent level for six months.

West Penn Wages Reduced

Wages on the Coke Region, McKeesport and Allegheny Valley Divisions of the West Penn Railways, Pittsburgh, Pa., have been reduced 5 cents an hour effective May 1. The wages formerly paid were:

First three months	64 cents
Next nine months	68 "
Thereafter	70 "

The scale of wages, effective May 1, reduces these figures to:

First three months	59 cents
Next nine months	63 "
Thereafter	65 "

On the Kittanning, Leechburg and McDonald Divisions the rates were reduced 9 cents an hour. The rate formerly paid was:

First three months	63 cents
Next nine months	67 "
Thereafter	69 "

The new rate which went into effect on May 1, reduced these figures to:

First three months	54 cents
Next nine months	58 "
Thereafter	60 "

The reduction in wages was accepted by the trainmen without comment.

Consistency, Thou Art a Jewel!

A situation has arisen in Chicago which places the city administration in an embarrassing position. Some months ago the City Council in furtherance of its fight on increased fares took the stand that the local railway companies had violated the terms of the ordinance under which they operate and that they no longer have any legal right to exist. More recently the city became interested in a movement to have a "pageant of progress" in Chicago late in July, the exhibits to be placed on the municipal pier. The Chicago Surface Lines has a loop on an upper deck of this pier. Mayor Thompson, as a citizen and as president of the pageant association, applied to the Public Utilities Commission to compel the railway to remove these tracks to a lower level. Inasmuch as this would involve an expenditure of about $200,000, the Surface Lines resisted this petition. It points to the fact that Mr. Thompson as Mayor claims the company is operating without authority, while as president of the pageant association he had to recognize the company's existence. The commission will pass on the matter at an early date.

New Interurban in New Orleans

Negotiations that have been going on for some time between prominent property holders of the St. Bernard parish and business men of New Orleans, La., with large interests in industrial plants located in that section, culminated recently in the announcement that the Orleans-Kenner Interurban Electric Railway will be extended to St. Bernard parish. The road now operates between New Orleans and Kenner, La., in Jefferson parish.

The purpose of the extension is to give the Orleans-Kenner line, as the road is known locally, the right to traverse New Orleans through to Shell Beach in St. Bernard parish, a distance of about 30 miles. This will make a 46-mile line from Kenner in Jefferson parish to Shell Beach, St. Bernard parish.

H. K. Johnson, builder of the Orleans-Kenner electric interurban, who has recently resumed active management of the property, will undertake the construction of the proposed extension. Rights of way and the necessary financial assistance have been pledged by Mr. Johnson. A committee has been appointed to map out a route and secure the balance of the rights of way and to apply formally to the City Commission Council for a franchise for the new line.

Receiver Urges Municipal Ownership

If the city does not purchase the property of the Ashtabula (Ohio) Rapid Transit Company, the road will, by fall, be sold for junk and the tracks torn up. This is the opinion of Charles Currie, Cleveland, one of the receivers of the company. Mr. Currie, in company with A. R. Raymer, Pittsburgh, the other receiver, appeared before City Council recently and said he did not make the statement about scrapping the line with the idea of driving the city to purchase the property, but he gave this as his honest opinion of what will be done in case the deal that is proposed with the city does not go through.

Mr. Currie drew attention to the fact that the company had reduced the selling price of the property $81,000 from the price of $296,000 at which it was offered to the city at the time the deal for it was first contemplated, and after which the electors of the city voted a $350,000 bond issue to buy the road and procure additional equipment and make necessary repairs. The last proposal of the receivers is that they will dispose of the property for $215,000.

Paving Costs Reduced in New York

One of the important bills passed by the New York Legislature at the last session and signed by Governor Miller amends Section 178 of the Railroad Law in relation to paving and repair of streets. The change consists of the following insertion: "but nothing contained in this section shall require any street railroad corporation to make pavements or repairs over openings made in the streets by any person, municipality or corporation other than such street railroad corporation, for any purpose other than the pavement or repavement of the street." Under this provision the electric railway companies will not be required to lay pavements or make repairs to pavements over openings made in the streets by any person, municipality or corporation for the construction or repair of sewers, water mains or any other similar subsurface work.

Matthew Brush Testifies in Investigation

The special committee of the Massachusetts Legislature, which is investigating alleged irregularities in the passage of street railway legislation in 1918 and 1919, has been granted an extension of time to May 16, for filing its report. All witnesses have been heard, practically every member of the two Legislatures having appeared voluntarily. Matthew C. Brush, former president of the Boston Elevated Railway, testified, as did also several bankers and brokers.

Mr. Brush was easily the star witness. With that same engaging frankness and refreshing good nature which so often in the past has disarmed hostile and unjust criticism of the railway management, Mr. Brush recited in great detail the steps leading up to the enactment of the so-called public control bill of the Boston Elevated. He told of his own strenuous efforts to convince the members of the Legislature of the necessity for relief for the elevated, and as far from denying having met and talked with legislative members at clubs and at private homes, he said it was his job to talk to everyone, from newsboy to Governor, anywhere he could get hold of them. He strenuously denied, however, that any money, gifts or inducements of any kind were offered to influence votes. He knew of no members speculating in street railway stock at that time, and was positive that if they did so it was not on the suggestion or under the influence of the railway management.

As a result of the questioning of former legislators it was found that out of several hundred members only about twenty-five or thirty were involved in the stock speculations, some of these having purchased Boston Elevated securities, others Massachusetts Electric, and a few "took a flyer" on both. They were about equally divided between Republicans and Democrats, and many of them were opponents of the legislation in question, and voted against it. During the whole course of the testimony no witness showed any connection between the railway managements and the stock speculations of the legislators, nor was there any allegation of improper influence or inducements offered by the railway managements.

Speculation is rife in political circles as to what recommendations the committee will make in its report as to possible action to be taken against those men who bought railway stocks and then voted on bills affecting their financial status. It is generally believed that the committee may turn the evidence over to the District Attorney for such action as he may see fit. Some elements are demanding that members should be expelled who speculated in the stocks and are still in the Legislature.

Provision Recommended for Municipal Ownership

Without a dissenting vote, the sixteen members of the committee on municipal and parochial affairs of the Constitutional Convention, now sitting in Baton Rouge, La., has favorably reported an ordinance which gives the city of New Orleans the right to own and operate all of its public utilities, expropriate them and conduct them under municipal ownership. Commissioner Paul Maloney, of the Public Utilities Committee, expressed his pleasure on learning that the measure had been approved by the committee and remarked that in case of its adoption by the convention, means would be available to the city of New Orleans to call municipal ownership to its aid whenever the need arose for such action.

Be Sensitive to Suggestion If You Would Rise

Words of advice from octogenarians on "how to live long and happily" usually fall on deaf ears. But a suggestion on how to be of greater service from the "man higher up" on the job is not always to be spurned. Such a piece of literature is "The Thing That Will Count Most If You Want to Be Promoted," a reprint of an interview with Samuel Insull, president of the Commonwealth Edison Company, Chicago.

In a simple and interesting way Mr. Insull tells of his own early experience. A perusal of it will encourage the countless number of employees who enter business with little or no equipment and will give those who are endowed with special qualities and accomplishments an insight into how high they can mount. To do more than what is expected of you is no new rule for success. Conductors and motormen of railway properties who do a trifle more than their fellow employees in the way of courtesy and are a bit more solicitous for the safety of the patrons eventually find themselves in line for positions higher up.

Wages Reduced in Grand Rapids

Wages for trainmen of the Grand Rapids (Mich.) Railway were reduced 10 cents an hour according to the terms of the new agreement recently signed which expires May 1, 1922. The rates were formerly 56 cents an hour for the first three months, 58 cents for the next nine months and 60 cents an hour thereafter with 5 cents additional for safety car operators. The new scale now in effect is 46 cents, 48 cents and 50 cents, with 5 cents extra for safety car operators. Overtime work will be paid for at the rate of 10 cents an hour additional, with a minimum overtime pay of one hour. The open shop principle was continued as a clause of the agreement. The contract in effect last year made it compulsory that trainmen should work not to exceed six days in any one week. In the new agreement this is made optional with the employee, who may now work seven days a week, permitting his one day a week off to accumulate so that he may take his time off all at one time, or he may work continuously without any time off.

News Notes

New Franchise Drafted.—The City Council of Galesburg, Ill., recently agreed upon a franchise ordinance for the Galesburg Railway, Lighting & Power Company. The company has been operating for some time now without a franchise because the City Council could not agree on a new one. The franchise as now drafted provides for extensions of car line and includes some agreement for service on the part of the company over the track which the city proposes to build to Lincoln Park.

Wages Undisturbed Pending Negotiations.—The officials and members of the Amalgamated at Pittsburgh, Pa., on April 28, provisionally accepted a proposition from receivers of the Pittsburgh Railways that they continue in effect present wages and working conditions for one month while negotiations are continued. The wage scale expired at midnight on April 30. The extension will continue it in force until June 1. Conferences have been proceeding between the receivers and the men's wage scale committee, the working conditions being under discussion. The wage question has not been brought up, neither side indicating to the other that it had anything to suggest.

Mayor Urges Municipal Ownership.—Mayor Marshall of St. Joseph, Mo., has come out for municipal ownership of public utilities. In his recent annual message the Mayor said: "Our citizens should bear in mind that we can buy approximately $14,000,000 of public utilities and our taxes be not raised a cent. The last Legislature gave us the right to assess 20 per cent of our valuation to buy public utilities and the expenses and interest charged directly against the utility and not the city, so that we can, if the electors and your honorable body desire, take over the street railway, the gas company and waterworks, and I believe it is time to start on these improvements and acquisitions. We should do it now and not let it drag."

Programs of Meetings

New England Street Railway Club

The New England Street Railway Club will hold its next meeting in Hartford, Conn., on May 18, in a joint session with Company Section No. 7 of the Connecticut Company. It is planned to have the Boston members take the 9.15 a.m. train from the South Station, members at Worcester, Springfield and other places being picked up en route.

An informal luncheon will be served between 12 and 2 p.m. at the Weathersfield carhouse in Hartford. At 3:30 p.m. a short talk on "Appraisals" will be given by E. Irvine Rudd, chief engineer of the Connecticut Public Utilities Commission, followed by a moving picture exhibition.

The dinner will be held at 6:30 p.m. at the Hartford Club. The subjects of the talks have not been announced, but Richard T. Higgins, chairman of the Connecticut Public Utilities Commission, and Lucius S. Storrs, president of the Connecticut Company, have promised to speak.

Southwestern Electrical & Gas Association

At the Street & Interurban Railway sessions of the Southwestern Electrical & Gas Association Convention, which will open on May 18 at Galveston, Tex., notice of which was made in the ELECTRIC RAILWAY JOURNAL, issue of May 7, subjects of great interest to the industry will be discussed in an informal way. They are as follows:

Modern Fare-Collection Methods and Their Relation to Accident Prevention, Alves Dixon, superintendent El Paso (Tex.) Electric Railway.

The Desirability of the Universal Adoption of a "Front Entrance" for all Cars, Both Single and Double-truck, as a Means of Safer and Quicker Service to the Public, C. O. Birney, Inventor of the "Safety Car."

The Inspection of Cars on a "Mileage" Basis Instead of on a "Time" Basis, F. J. Bennett, Houston (Tex.) Electric Company.

The Urgent Necessity of Greater Economy and Efficiency in Car Lubrication, Walter Silvus, superintendent of equipment, Texas Electric Railway.

The Economy and Efficiency of the Substitution of "Ball" or "Roller" Bearings for the Ordinary "Friction" Bearing, J. T. Porter, Northern Texas Traction Company.

General Track and Roadway Problems of the Minute. A "Round-the-Table" Discussion for all Attending.

The Advantages of the "Bow" or "Pantagraph" Trolley Collector over the Ordinary Trolley-Wheel, A Manufacturer.

A Practical Experience in the Use of "Telephone Dispatching" on City Lines, W. W. Holden, superintendent of transportation, San Antonio Public Service Company.

Where It Is Economical to Substitute Steel Trolley Wire for Copper or "Composite" Trolley Wire, L. E. Delf, Electrical Engineer Northern Texas Traction Company.

Modern Car-Painting Methods, Round-the-Table Discussion.

Training the Supervisory Forces, the Chairman.

Financial and Corporate

Missouri Tax Upheld

U. S. Supreme Court Rejects Plea of Interurban with Respect to Method of Fixing Tax Value

The contentions of the St. Louis & East St. Louis Electric Railway in its case against the State of Missouri in the matter of a tax levied on its property were denied by the Supreme Court of the United States in an opinion handed down on May 2.

The electric railway, known as the Bridge Electric Company, was the owner in 1906 of 0.865 of a mile of electric railway constructed upon and extending from the easterly to the westerly end of the Eads Bridge. In that year the Missouri State Board of Equalization valued the portion of this railroad which was within that state at $186,019 and levied a tax upon it for state and local purposes. The Bridge Electric Company contested the tax and sued to recover the amount collected, charging that the tax is invalid on the ground that it constitutes a direct and unconstitutional burden on interstate commerce.

$500,000 PER MILE

The state statute provided that in valuing railroads for taxation the State Board of Equalization should determine the total value of the entire property in the state, tangible and intangible, of each company and that from this total it should deduct the value of all its tangible property and then "enter the remainder upon the assessment list under the head of 'all other property.'"

The Board of Equalization valued all the rolling stock, poles, wires and cash of the Bridge Electric Company at $32,630; the road-bed and superstructure at $5,000 per mile and "all other property" at $500,000 per mile, making a total value per mile of $537,630.

There were 0.346 of a mile of the track in the State of Missouri and this proportion of the total value per mile, amounting to $186,019 (of which $173,000 was included under the item "all other property"), was the amount on which the disputed tax was levied.

It was not contended that this valuation was unreasonable in amount but only that the property of the company which was valued as "all other property" consisted solely of its franchise to conduct interstate passenger traffic over the interstate bridge and that, therefore, the tax so far as levied on the valuation placed on the property is concerned, is a direct tax and burden on the right to engage in interstate commerce and thus unconstitutional.

The Supreme Court states, however, that "the stipulation on which the case was tried does not sustain this contention."

In concluding the court says:

> We cannot doubt that the contracts we have described, which very plainly gave to this short-line of railway much of the value as a going concern which led the company to bond and capitalize it at $1,000,000 and the board to value it at approximately one-half that amount, must have been taken into consideration by the board and that, therefore, the contention that the tax was levied exclusively upon the franchise to do an interstate business is not sound and must be rejected.

The opinion of the court was delivered by Justice Clarke.

Large Saving on Labor in Kansas City

Continuous and steady improvement in earnings, under the receivership, is reported for the Kansas City (Mo.) Railways. Despite bad weather and a definite amount of unemployment gross revenue is maintained at a substantial level compared with former similar periods, and there is a constantly bettering relation between revenue and expenses.

One item that offers interesting opportunity for comparison is that of labor cost. The company is operating the largest number of cars in its history, 720 on the high peak of schedules, with 900 fewer employees than a year ago. Several developments make this condition possible. Changes in the power plant, including installation of an ash carrying equipment, reduce the labor requirement there. In the shops 100 fewer men are employed than a year ago; last year the shop was loaded to capacity in the repair and overhauling of cars, and equipment was put into first class shape.

More Representative Name Chosen

The directors of the Monongahela Valley Traction Company, Fairmont, W. Va., have voted to change the name of the corporation to Monongahela Power & Railway Company and not the Monongahela Traction & Light Company, as noted in the ELECTRIC RAILWAY JOURNAL for May 7, page 874.

Officers of the company state that the change is brought about by the fact that the power and lighting departments of the concern have been growing by leaps and bounds not only along the lines of the interior, where great power houses have been built and the company is moving large quantities of coal and other freight, but on the lines in Parkersburg and along the interurban as well. The change of name it is believed will be to the interest of the company as it relates to the chief department of the corporation, and it will improve the market for the securities of the company.

End of Receivership Urged

City Says Pittsburgh Railways Is Rebuilding Lines Out of Earnings at Ten-Cent Fare

George N. Munro, special solicitor for the city of Pittsburgh, Pa., in charge of utility legislation, declares that the Pittsburgh (Pa.) Railways during the year 1920 earned more than $2,000,000 over and above operating requirements and that the surplus fund, swelled on account of excessive fares, has been used for improvements and betterments instead of protection for creditors. A report by him to this effect urging the end of the receivership was read on May 3 before the City Council and Mayor Babcock.

The report recommends that the property be formally returned to the bondholders in view of the fact that the Public Service Commission valuation of $62,500,000 is less than the $64,000,000 of outstanding securities bearing interest. The conclusions drawn by Mr. Munro are based on statements of earnings and expenditures obtained on April 1 from the receivers and on engineers' estimates and estimates made by the receivers before the Public Service Commission.

According to Mr. Munro after an allowance of $15,986,000 for expenses, which included $985,000 for normal depreciation and an excess of $1,900,000 for wages over 1919, figured on the budget basis by engineers, the company received income ranging from $600,000 to more than $2,000,000 in excess of all expenses and a 7 per cent return depending upon the valuation accepted as a basis for figuring the earnings. The valuations on which this computation was made were taken as the figure of $48,000,000 by the city's engineer, $70,000,000 for the company's engineers and $62,500,000 found for the Public Service Commission.

Mr. Munro contended that the property was being rebuilt out of earnings and at the expense of the car rider whereas much of the work done was really a charge to capital. He argued that while it was desirable that the property be properly maintained, the public, if it was to pay for rehabilitation as well as for transportation, should have something to say about the disbursement of the excess money.

The reply of the receivers characterized the deductions made by Mr. Munro as "palpably erroneous and at best irrelevant." They contend that such improvements as were made were carried out in the interest of the car riders at the behest of the court and in pursuance of the court's policy that the service furnished by the receivers should be regarded as the paramount purpose in their administration. They characterized as lacking in every element of truth the charge by Mr. Munro that instead of using this fund to take care of unsecured creditors, for whose protection this receivership was invoked, they are building up the property out of earnings and thereby unduly continuing the receivership. According to the receivers "it is evident that no policy or action is possible to meet the divergent views of the various city officials and that no determination can be reached except by adjudication." Further the receivers say that the city has unnecessarily delayed the valuation proceedings. The receivers recite that in March, 1920, the State Public Utilities Commission fixed the valuation of the company at $62,500,000, but that the city waited about six months, or until near the expiration of the time for filing an appeal from the decision of the commission, before its representatives took an appeal to the Superior Court. Argument was set for April 15, 1921, but as that date approached a postponement was asked and granted over the protest of the receivers.

On May 6 a conference was held with members of the Council at which the receivers were asked to attend to discuss the possible reorganization of the railway. At that conference a letter was read which had been written by Mr. Munro to Solicitor Pritchard. In this communication Mr. Munro said that the receivers "instead of coming back at us with equally conclusive evidence content themselves with making a general denial." He confessed himself disappointed at the answer of the receivers, and was "inclined to think that their reply is a studied effort to confuse the issue." "In short," said Mr. Munro, "you will notice they made no effort to give any items to substantiate their reply." He also says the company is in error with respect to the delay by the city in the proceedings before the court.

Briefs Filed in Lease Case

The city of Philadelphia has filed a brief in the Supreme Court of that State setting forth the position taken by the city in appealing against a decision of the Superior Court to the effect that the Public Service Commission has no authority to inquire into the rentals paid by the Philadelphia Rapid Transit Company to the underlying concerns. The printed briefs were filed by the city preparatory to the argument, in which the same contentions are raised as were made in the Superior Court. Briefs on behalf of the Philadelphia Rapid Transit Company and its subsidiaries were also prepared for filing.

The Rapid Transit Company is paying to the underlying companies rentals amounting to approximately $10,000,000 a year for the use of their franchises. The city maintains that the Public Service Commission has the right to ascertain whether or not these rentals are excessive, whereas the Superior Court has ruled that inquiry into this matter is not one of the commission's lawful functions.

The city bases its appeal on the dissenting opinion of Justice Keller, who did not agree with the majority of the Superior Court in deciding in favor of the underlying companies.

$1,000,000 Increase in Gross

Prospects Are that North Shore Road Will Profit Materially by Decreasing Cost

An increase of $955,748 in gross operating revenue of the Chicago, North Shore & Milwaukee Railroad is shown in the annual report for the year ended Dec. 31, 1920. Despite this very favorable showing made by the company in securing new business, the net operating revenue as compared to the previous year increased only $46,164 and the net income $1,172. The accompanying consolidated income account shows the comparison with the year 1919 for the various items.

	1920	1919	Increase
Gross operating revenue	$4,193,669	$3,237,921	$955,748
Operating expenses	3,229,048	2,319,464	909,584
Net operating revenue	$964,621	$918,457	$46,164
Taxes	151,746	163,101	11,355*
Operating income	$812,875	$775,356	$57,519
Miscellaneous income	10,332	17,879	7,547
Gross income	$823 207	$773,235	$49,972
Fixed charges	390,196	341 396	48,800
Net income	$433,011	$431,839	$1,172

* Decrease

The consolidated income statement for the years 1916 to 1920 inclusive forms an interesting exposition of the manner in which the business of a railroad may be built up by bettering the physical property and giving high grade service.

The report reviews briefly the operating conditions pertinent to the financial statement and also the physical improvements made in the property during the year. It was pointed out that the increase in the gross operating revenue was almost all absorbed by the increased cost of labor. The improved service resulting from the operation of safety cars on the city lines of Waukegan, Ill., brought an increase in revenue on those lines of 39 per cent, and for the first time they are showing a tendency toward becoming self-sustaining. The rate of fare on both the Milwaukee city lines and the Waukegan city lines was increased from 5 cents to 6 cents during the last half of the year. On Sept. 1, 1920, the interstate rates on the interurban lines were increased from 2.5 to 2.7 cents per mile and on Nov. 1, 1920, to 3 cents per mile. On Sept. 17 an increase of approximately 33⅓ per cent in freight rates became effective.

	1916	1917	1918	1919	1920
Operating revenue	$1,157,191	$1,751,373	$2,899,975	$3,237,921	$4,193,869
Operating expenses	714,887	1,114,512	1,856,038	2,318,464	3,229,048
Net operating revenue	$442,304	$636,861	$1,043,937	$918,457	$964,621
Taxes	66,038	95,680	185,822	163,101	151,746
Operating income	$376,266	$541,181	$858,115	$755,356	$812,875
Miscellaneous income	6,208	4,858	9,470	17,879	10,332
Gross income	$382,474	$546,039	$867,585	$773,235	$823,207
Fixed charges	237,996	266,580	332,056	341,396	390,196
Net income	$144,478	$279,459	$535,079	$431,839	$433,011

The amount expended during the year for additions and betterments and for reconstruction was $1,338,079, of which $800,000 was for new equipment contracted for in 1919. During the year the company authorized and issued $1,500,000 of ten-year 7 per cent sinking fund notes secured by first mortgage bonds, of which $707,400 were issued in 1920. The company paid off and cancelled $600,000 of collateral notes and $72,000 of equipment notes and purchased and cancelled $27,000 of the ten-year sinking fund notes.

Among the physical improvements mentioned in the report are the construction of 9,982 ft. of new sidings at sixteen locations in Illinois and Wisconsin; the construction of 4,500 ft. of new roadway, paved with brick on concrete base, and paralleling the old roadway, in order to make room for the double tracking of the line at this point; the widening and ditching of cuts and placing of 4,358 lin.ft. of drain tile; the replacement of 65-lb. rail on ten miles of single track with 80-lb. rail; the renewal of 20,000 ties; the placing of 47,000 cu.yd. of ballast; the surfacing of 26 miles of single track; the rebuilding of ten miles of right-of-way fence; and the erection of a new substation building at Ravinia for which there was purchased and installed an automatic controlled 1,000-kw. rotary converter.

During the year an Employees' Mutual Benefit Association was formed. The members of this organization will receive a sick benefit of $6 a week and a death benefit of $300. Each member pays $1 a month and the company contributes 50 cents a month per member toward the support of the association, which now has a membership in excess of 500.

An enlargement of the safety organization and the development of a fine spirit of co-operation on the part of all employees not only in accident prevention work but in closer observance of rules and a desire to give the public the best of service is pointed out as one of the features of the year's progress. There were held 134 meetings of employees to promote safety.

$4,936,976 Fixed as Lynchburg Value

Elements of Value Include Reproduction Cost New Dec. 31, 1916, This Cost Appreciated 10.8 per Cent, Actual Cost of Additions During War Period, and Developmental Costs

A. L. Drum & Company, consulting engineers, Chicago and Philadelphia, representing the Lynchburg Traction & Light Company, Lynchburg, Va., filed with the Corporation Commission of the State of Virginia on May 10 a final report on the cost of reproducing and developing the properties of the Lynchburg company. The valuation was made in accordance with the principles set forth by the Corporation Commission in its opinion of March 18, 1921, acknowledging the application for increase in light and power rates.

THE report comprises (a) the cost to reproduce the physical property as of Dec. 31, 1916, based on average prices prevailing from 1912 to 1916 inclusive; (b) cost to reproduce the physical property as of Dec. 31, 1916, based on 10.8 per cent normal appreciation to Feb. 1, 1921; (c) actual cost of additions to property from Jan. 1, 1917, to Feb. 1, 1921, and (d) developmental costs.

The basis of the valuation as prescribed by the commission excluded the use of abnormal war prices except actual expenditures made under such conditions. The opinion of the commission provided that "to the probable fair 1914 reproduction value may reasonably be added a normal appreciation for the years since that time. Had there been no war there would have been a gradual rise in prices due to increasing costs of production. Thus we have a basis which allows the company the benefit of appreciating values in normal times, based on pre-war values plus actual additions made at war prices."

The engineers, in conforming to this ruling, assumed that the average unit prices prevailing for the five-year period from 1912 to 1916 inclusive would represent fair average prices prevailing as of June 30, 1914, and applied such to the Dec. 31, 1916, inventory of the physical property. The appreciated value was derived by increasing the 1912-1916 valuation by 10.8 per cent, this being 1.57 per cent per annum compounded for six years and seven months. It was derived from price indices on about 340 commodities for the sixteen years from 1900 to 1915 inclusive. The trend of prices over this fairly uniform period of rising prices indicated an increase of 1.57 per cent per year compounded, and was held to represent a fair index of normal appreciation in values. A chart showing the price indices of commodities and the derivation of the 1.57 per cent is attached to the report.

The treatment of developmental costs is of particular interest as it embraces three main subdivisions: (a) Expenditures for obsolete equipment and construction; (b) cost to unify the system; (c) losses during the early years of operation. The total developmental costs as reported equaled about 16 per cent of the valuation of the physical property.

The expenditures for obsolete equipment and construction comprised the depreciated value of the property at the time of supercession and was subdivided as between the railway, electric light and gas departments. The developmental costs under the railway department represented superseded horse car lines, power stations, car houses and original electric cars. Under the electric light department the developmental costs included superseded power station equipment, transmission lines and street lighting equipment destroyed prior to the end of its useful life due to consolidations and changes in the art. Reliable data covering superseded property in the gas department were unavailable and as that superseded was known to have had a normal life no claim was made for developmental costs in this department.

The cost to unify the system represented an estimate of the cost incident to the creating and consolidating of the various thirteen companies comprising the present Lynchburg Traction & Light Co. It was derived after an investigation of such records of the companies as were available.

The losses during early operation represented the deficit of return on the investment during the early period of operation up to the time the business had become established on a paying basis. A summary of the cost of reproducing and developing the property as of Feb. 1, 1921, is given in the accompanying table.

TWENTY MILES OF RAILWAY

The accrued depreciation as reported represented the amount of existing depreciation due to wear and use as determined by inspection and measurement in the field. It is not based on theoretical depreciation due to age or obsolescence. The amount of accrued depreciation for the railway department is given as $140,203, for the electric light department as $108,640 and for the gas department as $52,635, making a total of $301,478.

The Lynchburg Traction & Light Company owns and operates the street railway, electric light and gas utilities in Lynchburg and vicinity, the street railway consisting of 19.25 miles of single track, thirty-nine passenger cars and three service cars. Power is obtained from the Ruesens hydro-electric station and the Blackwater Creek steam station, both of which jointly serve the railway and electric light departments. The generating and converting equipment devoted exclusively to the railway department aggregates 1,650 kilowatts capacity, all of which is located in the Blackwater Creek steam station.

The Ruesens hydro-electric station, located on the James River about 4½ miles north of Lynchburg, is equipped with three water wheels with a generating capacity of 2,500 kw. The dam is of cut stone masonry with concrete crest, about 425 ft. long, 32 ft. high and develops a net effective head of 22 ft.

ONE-THIRD POWER CAPACITY FOR RAILWAY

The Blackwater Creek station is a steam station of 2,000 kw. capacity, not modern in construction, and is utilized as an auxiliary plant in connection with the Ruesens hydro-electric station, to which it is connected by a new double transmission line. There are 5,335 residence, commercial and power meters in service, and 731 municipal series incandescent street lamps are connected to the system. Of the total amount of power generated, approximately 36.4 per cent is used in the operation of the railway.

The gas plant consists of three benches of inclined coal gas retorts, six retorts to each bench, also two Lowe water gas sets, with the necessary condensers, scrubbers, purifiers and residual equipment. The plant capacity is about two and one-half million cubic feet of gas per day. There is one 50,000 cu.ft. relief holder and one 200,000 cu.ft. storage holder. The distribution system consists of 41.28 miles of gas mains, with 3,752 meters connected.

SUMMARY OF COST OF REPRODUCING AND DEVELOPING THE LYNCHBURG PROPERTY AS OF FEB. 1, 1921

	Railway Department	Electric Light Department	Gas Department	Total
Physical property:				
Estimated cost to reproduce the physical property as of Dec. 31, 1916, based on average prices, years 1912-1916, inclusive	$1,328,998	$1,714,295	$582,806	$3,626,099
Estimated cost to reproduce the physical property as of Dec. 31, 1916, based on 10.8 per cent normal appreciation to Feb. 1, 1921	1,472,530	1,899,438	645,749	4,017,717
Actual cost of additions to property Jan. 1, 1917, to Feb. 1, 1921	49,476	73,224	112,464	235,159
Total cost to reproduce the physical property as of Feb. 1, 1921	$1,522,000	$1,972,662	$758,213	$4,252,876
Developmental costs:				
Expenditures for obsolete equipment and construction	$134,503	$95,770	....	$230,273
Cost to unify system	73,794	94,328	$31,878	200,000
Loss of interest during operation	93,654	119,715	40,456	253,826
Total developmental costs	$301,951	$309,813	$72,334	$684,099
Total cost of reproducing and developing the property	$1,823,951	$2,282,476	$830,548	$4,936,976

New Rhode Island Company Selects Directors

Former United States District Attorney Harvey A. Baker has been nominated by Mayor Gainer of Providence, R. I., to represent the public on the board of directors of the United Electric Railways, which is soon to operate the electric railways now run by the Rhode Island Company. The election of Mr. Baker and eight other directors was recommended by the joint reorganization committee.

The other proposed directors are Zenas W. Bliss and George H. Newhall, appointed by Governor San Souci and confirmed by the Senate; Ralph S. Richards, representing the Rhode Island Hospital Trust Company, representing the holders of the general mortgage bonds; Edward B. Aldrich, Frederick S. Peck, Richard B. Comstock, Harold J. Gross, and J. Cunliffe Bullock, representing the stockholders.

At present and for the purpose of effecting a temporary organization there are five stockholders of the United Electric Railways. These will be called together soon, and are expected to confirm the choice as directors of the five men nominated to represent the stockholders.

$4,100,000 Value Placed on Interurban

The Public Service Commission of Pennsylvania in the case of the city of Erie vs. the Buffalo & Lake Erie Traction Company has found the fair value of the property of the railway to be $4,100,000. It holds that upon this sum the company is entitled to a fair return over and above its operating cost and annual maintenance. The decision of the commission is to the effect that lines of street railway track that have been abandoned and are no longer used or useful in the public service should not be included in any fair value for rate-making purposes.

The commission further holds that a power plant which is no longer used by a street railway but is leased to an electric company at an annual rental is a potential asset and will be included in a fair value for rate-making purposes. In its reproduction cost estimate the commission made allowance for overhead on real estate, depreciation and working capital. Bond discount was not allowed. The commission further said that the market value of stocks and bonds issued by an interstate corporation covering property both within and without Pennsylvania afforded no proper criterion as to the value of the property for rate-making purposes within the State.

The commission also reiterated the fact that it is well-settled law that an active going concern rendering efficient service has a greater value than an idle one and that going concern values should be considered and included in determining the fair value of a utility for rate-making purposes. Finally the commission recommended the issuing of school tickets good between certain hours and the sale of book tickets at a reduced rate.

Indebtedness Limitation Removed

In regard to the recent action by the Minneapolis (Minn.) Street Railway in removing its limit of indebtedness beyond $1,200,000, W. D. Dwyer, counsel for the company, explains:

> The limitation was put on when the stockholders had no idea of the size to which their business would grow. It would have been impossible for the company to live up to it and continue in business. No stockholder ever objected to the directors disregarding it, and if one had there is no doubt that the courts would uphold the company. It was just a dead letter—one of those laws that are never lived up to—and we decided to get rid of it.

Movement in Interest of New York Security Holders

An organization known as the Public Utility Security Holders' Association has recently been formed in behalf of the 55,000 holders of the securities of the electric railways in Greater New York. Headquarters have been established at 605 Fifth Avenue, New York, with Ernest P. Fredericks as managing director. A uniform plan of assessment consisting of 50 cents per $1,000 bond or 5 cents per share of stock has been made, with a minimum assessment of $1. The advisory board at present consists of ten members who are men of standing in their business and professional life and representative of the great majority of security owners. The members are E. H. Hicks and Henry Franciscus, Brooklyn; Bernhard Blitzer, Gustav Kimpel, C. A. Fairchild, S. H. P. Pell and Theodore Koupal, New York; E. S. Gardner, Springfield, Mass.; Wallace Pyle, Jersey City, N. J., and E. G. Hamersly, Philadelphia, Pa.

Mr. Fredericks has been identified in the past with campaigns conducted in the interest of traction security holders in Boston and in Canada.

Dayton Roads All Losing Money

That the railway of Dayton, Ohio, are facing bankruptcy was announced at a conference called to consider plans to bring about more favorable conditions among the companies there.

Harry P. Clegg, president of the Oakwood Traction line, advanced the claim that not one of the local companies was making operating expenses. The Oakwood line, which extends from East Oakwood to Daytonview, is said to have been running behind steadily for five or six years. The Dayton line has paid no dividends for four years and has met expenses by borrowing money, and the Peoples' Company, owners of several divisions, paid its last dividend out of its surplus.

Representatives of the various companies informed the City Commission that under existing conditions there was no use continuing operations. However, no plea was made for an increase in fares and it is understood there will be none.

Financial News Notes

Preferred Stock Dividend Resumed.—A quarterly dividend of 1½ per cent has been declared on the oustanding $2,300,000 of preferred stock of the Cumberland County Power & Light Company, Portland, Me., par value $100. This is the first dividend on the preferred stock since May, 1918, when 1½ per cent was paid in scrip.

Interurban and City Accounts Adjusted.—A settlement of accounts between the Cincinnati (Ohio) Traction Company and the Interurban Railway & Terminal Company has been approved in the Common Pleas Court. Under the agreement the traction company secures title to the former interurban tracks and overhead wires in the former villages of Pleasant Ridge and Kennedy Heights. The traction company is to pay the Interurban $5,000 in cash and cancel $49,000 of receiver's certificates issued by the interurban in favor of the Cincinnati Traction Company.

New Interest in Purchase by City.—The public utilities committee of the Board of Supervisors of San Francisco, Cal., has agreed to recommend that $15,000 be made immediately available for the use of City Engineer M. M. O'Shaughnessy in making the necessary study of the United Railroads properties and recommending a price at which the city can afford to take them over. Reasons urged upon this committee by various organizations for this action are: the need of (1) one fare with a universal transfer, (2) the elimination of four-track conditions on Market Street, and (3) the very large majority by which the Charter Amendment No. 30 was carried at the last election. (This amendment provides for the purchase of public utilities on the installment plan.)

Sale Ordered by Court.—Under an order issued by Judge E. B. Museout of the Forty-fourth District Court at Dallas, Tex., the properties of the Standard Traction Company, Dallas, were ordered to be sold at public outcry on May 3 to satisfy a judgment for $5,000 in favor of C. C. Farmer and wife. The Standard Traction Company owns the railway serving the Mount Auburn and Parkview additions to the city of Dallas, now leased to the Dallas Railway and being operated by that company. J. H. Power is president of the Standard Traction Company. The company was organized by the real estate firm that placed these two additions on the market. It has offered to deed the property to the Dallas Railway with the condition that through service be maintained from the business district to these additions.

Traffic and Transportation

Jitney Ordinance Works Well

Regulatory Measure in Kansas City Restricts Autos to Routes Where There Are No Car Lines

Elimination of jitneys from the streets of Kansas City, Mo., having electric railway tracks has had many beneficial effects since the ordinance became effective on April 7. The ordinance had been passed previously by the City Council, but on April 7 an order from the Circuit Court of Jackson County released a temporary injunction secured by the jitney operators, and new schedules and routes for jitneys were established.

The most striking effect of the new plan of "co-ordinate" rather than competitive operation of transportation facilities is in the relief of traffic congestion. The removal of nearly 400 jitneys that had constantly operated on street car streets is an obvious relief to traffic congestion, particularly notable in rush hours.

The improvement in the accident record directly attributable to the elimination of jitneys from tracked streets has several significant bearings. Not only is service maintained at higher efficiency but there is a noticeable reduction in repair and wreck crew costs, and in the many expensive concomitants, including litigation of accidents.

RAILWAY SERVICE INCREASED

A second public benefit resulting from elimination of jitneys from tracked streets is the marked increase in street car facilities made possible by gain in patronage. The company had promised that more cars would be operated when jitneys were assigned to streets not having tracks. Sixty-five cars were added to service on April 7; and all these have since been retained.

The number of jitneys retired has been almost exactly the same as the number of cars added. The increase in number of cars was about 10 per cent; while the increase in revenue has been about 5 per cent—this disparity resulting from the fulfillment of promise to improve service over all lines at all hours of the day.

The Public Service Commission and other regulatory bodies set the standard for service in Kansas City at 640 cars as of July, 1917; the company is now operating 720 cars.

The justice and logic of the railway company's position regarding jitneys are being recognized more clearly as time passes. The company had not been fighting the jitneys as direct competitors, it had not sought or asked their complete elimination. The company had suggested that jitneys constitute a subsidiary transportation facility. The railway contended that the jitney, being a supplementary service, should be so operated as to fulfill its function for the public benefit to the best advantage. It should be required to build its prestige and business independently, in the service to which it was best adapted and most useful, and not to secure its business directly from the railway sources of business, nor in direct competition with the railway. The company did not agitate against jitneys, nor use publicity to put jitneys in bad repute.

Before the regulatory ordinance became effective, many citizens seemed to consider that the city officials were about to destroy the jitney service, from motives of hostility. The Council and the city officials patiently bore the criticism. It is said that the receivers, representing the public as well as the company, were able to present the matter effectively to the city officials.

About fifty jitneys discontinued operations immediately upon the ordinance becoming effective. Many others, while operating on the prescribed routes, are not maintaining schedules in non-rush hours. Even in rush hours, the schedules of the jitneys are not always followed.

The regulatory ordinance was attacked by jitney operators, and a temporary injunction secured against its enforcement. Upon final hearing, Judge Hall of the Circuit Court of Jackson County, at Independence, Mo., declined to make the injunction permanent. The jitney organization has appealed to the Supreme Court from Judge Hall's decision. Judge Hall concluded his finding with these words:

> The streets of the city, under the statutes, belong to the city and are exclusively under its control. No one can use the streets for any public purpose, like the transportation of passengers for hire, without the city's consent—neither a railway company, nor a jitney owner, nor anyone else.

Communities Back Fare Increase

Suggestive Ideas Are Contained in Rate Appeal to Which Railway Won the Support of Communities Affected

Passenger rates were increased on April 20 by the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., pursuant to an order issued by the Public Service Commission of Missouri on April 2. The increase was 25 per cent. It applies to commutation as well as other passenger rates. The remarkably small amount of "legal proceedings" involved in securing the adjustment constitutes an interesting phase of the event.

THE application, evidence, opposition and support regarding the increased rate were all presented in a frank, business-like and "uncontroversial" manner. All the cards were laid on the table by both sides, with the result that there was no contention against the rate increase as a whole. The only opposition to the application appeared in the form of a request that additional elements of service be installed—elements which the company had planned and was ready to establish.

As the proceedings developed, the minor items of controversy as to rates and service were adjusted by representatives of the different communities on the basis of more equitable distribution of a recognized higher cost of operation than was provided for under the old rate.

Preliminary to making the application for the increase Robert P. Woods, vice-president and general manager of the railway, discussed with officials of communities served the road's service and the approaching necessity for improvements. A careful survey was also made of opinion as to the road's service as viewed by the communities, and public officials were reminded of the expenditures that must soon be made. The attorneys for the communities in any proceeding regarding rates were shown data as to costs of maintenance and operation and of net revenue, and were invited to examine the company's records. The exhibits upon which the company was going to base its application for an increase were shown in advance of the hearing and convinced the officials that higher rates were necessary if their communities were to receive a continuance of the service.

As a result of these conferences each community, recognizing the need of the higher rate, bent its efforts to "protecting its rights," so that its service would not suffer, and it would not bear a disproportionate part of any increase.

Mr. Woods prepared the application himself—going to the heart of the matter. Seventeen exhibits showing valuation and operation data were also prepared and presented by him. The application as he wrote it contained scarcely 1,000 words. Four short paragraphs gave the data on the history of the company and its passenger rates. One paragraph asked straightforwardly for a 2½-cent rate (a 25 per cent increase), commutation rates to be advanced in the same proportion. Another paragraph gave the reasons for the request—that the company had charged only 2 cents a mile for seven years; that this rate had been inadequate for several years; that costs had risen greatly in the period; that all surplus had been put back into the road, and that heavy expenditures would have to be made to keep the property in first-class condition. The application was filed on Feb. 25.

A statement prepared by Allen G. Hoyt, president of the company, presenting the general subject of electric line rates, was filed separately, in support of the brief application.

ONLY ONE HEARING HELD

One hearing was held by the commission. This was conducted at Kansas City on March 11. Five witnesses testified in behalf of the application—Mr. Woods and four bankers. The bankers were called to testify as to the rate of return proper for an electric railway. Colonel C. F. Enright, former bank commissioner of Missouri, one of these witnesses, said the rate of return should be not less than 8 per cent; W. P. Fulkerson, banker, St. Joseph, Mo., testified that he would not want to invest in applicant's property on an 8 per cent basis because he could do better with other securities. W. T. Kemper, chairman of the board of the Commerce Trust Company, the largest bank west of Chicago, testified that nothing less than 8 per cent would be a reasonable return and that he did not expect interest rates to decline during the next few years. Mr. Hoyt, vice-president of the National City Company, New York, said that electric light and power securities, the most attractive in the public utility field, are selling to net more than 8 per cent, and that returns on electric railways, not in great public demand, should be materially above 8 per cent. There was no testimony or argument against the 8 per cent minimum return. No further evidence or testimony was presented by the company.

The "protests" regarding the application did not in any instance attack the principle of an increase, nor question either the exhibits of the company or the conclusions drawn by the company from these exhibits. Rather were the arguments by representatives of communities confined to an effort to attain an equitable distribution of the cost of operation among the communities.

COMPANY NOT INTERESTED IN METHODS

One community, for instance, sought to secure retention of its former commutation rates, and another, which had not had such commutation rates, claimed discrimination. Other communities responded that it would not be fair to require through traffic to bear a disproportionate rate for the special benefit of an intermediate station. The company made it plain that "if the commission will provide us adequate means for carrying on the necessities we have outlined, we do not care how the commission arranges the details, and as long as there is commutation rate in one place, we don't know why there should be discrimination." As a result further suggestions were made by the communities themselves toward equalizing both rates and service over the company's lines.

Incidental to the rate hearing—as an element in the costs of operation and ability to increase service under higher rates — various communities asked improvements. As a compromise among the communities, a limited train was agreed upon for Excelsior Springs which should make one stop, at Liberty. This item of increased service, together with the commutation rate asked for Excelsior Springs, was included in the order of the commission.

The order, issued on April 2, increased passenger rates from 2 to 2½ cents a mile; increased existing commutation rates of 1.3 cents a mile to 1.625 cents a mile (the same proportion, 65 per cent, of the regular rate as before).

In reviewing the exhibits and testimony the commission pointed out that the increase of 25 per cent to 2½ cents per mile, if granted, would provide a return for all purposes in excess of 8 per cent—as the figures indicated 8.2 per cent. The commission stated, however, that this rate of return might be reduced in fact through the establishment of the commutation rates and other items of service not previously among the expenses.

The new rates went into effect on April 20 without any objection having developed over the matter or complaint being heard.

The whole proceeding reflects a gratifying co-operation of the public with company and commission for the attainment of maximum permanent service from the utility. The representatives of the communities seem to have sought such results concerning rates and orders on other subjects as would bring about the most satisfactory operation of the railway for the interests of all concerned.

Five-Cent Fare Re-established

Keokuk, Ia., went back to a 5-cent fare the early part of April of this year under its original franchise ordinance which has about ten years to run. The validity of such franchise contract was a point involved in the case presented to the Supreme Court of Iowa in the suit of the Ottumwa Street Railway against the city of Ottumwa. A decision was made at that time holding that such a clause was not binding on the railway, and pending a decision on rehearing, the City Council of Keokuk, last December, granted the Keokuk Electric Company an increase to 7 cents. Rebate slips were issued, to be redeemed if 5-cent fares were established. Apparently with the belief that the convening of the Iowa Legislature would probably result in the introduction and passage of measures of relief for the utilities and that the new court which came in on Jan. 1 might reverse the court's former decision the Ottumwa Railway applied to the Supreme Court to dismiss the appeal. This was granted and as a result the City Council of Keokuk rescinded its action in regard to the 7-cent fare and ordered the company to cash the rebate slips and re-establish the 5-cent fare.

Rehearing on Fort Wayne Fares

Robert M. Feustel, president of the Indiana Service Corporation, Fort Wayne, Ind., states the company will not oppose the rehearing on the city's petition to secure a reduction in rates. This rehearing was recently granted by the Indiana Public Service Commission. The present fare is 7 cents, four tickets for a quarter. The city is seeking a 6-cent rate, nine tickets for 50 cents. Mr. Feustel says:

> In presenting the case before the commission, the city estimated that the minimum increase in passengers hauled in 1921 over 1920 would be 500,000 and that the probable increase would be 2,000,000 passengers. Up to date this year there has already been a decrease of more than 500,000 passengers below the figure for the same period last year.

In his statement giving the reasons for asking for a rehearing the city attorney alludes as follows to the matter of maintenance:

> The city of Fort Wayne is desirous that proper service be maintained, but it believes it unjust to do an abnormal amount of maintenance work, rebuilding of lines and such in a very short time, thus taxing the present car riders more than their just burden, to satisfy the desire of the present operator to get his Fort Wayne lines in the very best possible condition at the earliest possible moment.

Hartford Indorses One-Man Car

The Common Council of Hartford, Conn., on April 25 authorized the Connecticut Company to operate one-man cars in the city indefinitely. A resolution was adopted suspending for an indefinite period that portion of the Tucker agreement, so called, of 1894, providing that there must be a crew of two men on each car. The Connecticut Company's petition, embodied in the resolution as adopted, asked that the restriction be lifted "until such time as the proper authority of the city of Hartford shall notify the Connecticut Company six months in advance of its desire to cancel such suspension."

Except for this action by the Council, the Connecticut Company would have been compelled to withdraw its one-man cars from lines within the city of Hartford on May 1. By a vote on Sept. 22, 1919, the Council gave permission for the operation of the one-man cars until May 1, 1921, explaining that "the General Assembly of the State may pass legislation concerning electric railways and by that time the electric railway situation in the State may be clarified."

The Aldermen, acting on an unfavorable report from the joint committee, had then refused to authorize the operation of the one-man cars for an indefinite period. The problem was solved, however, when the Council adopted a resolution by which the company was empowered to operate passenger cars with one man as operator within the city limits until May 1, 1921. The resolution provided that "at the expiration of this permission, if no further permission is given, *ipso facto* said provision in said agreement (the Tucker agreement) revives and becomes in full force and effect."

Personal Mention

Promotion for R. H. Wyatt

Old-Time Operator Becomes Superintendent of Louisville & Interurban Railroad

Richard H. Wyatt, general freight and passenger agent of the Louisville & Interurban Railroad, Louisville, Ky., since 1910, has been promoted to the newly created position of general superintendent of the interurban system, which is a subsidiary of the Louisville Railway. Mr. Wyatt and Samuel Riddle, now vice-president and superintendent of transportation of the Louisville Railway have been handling jointly the work that is now handled by Mr. Wyatt as general superintendent. The change, which was effective on April 30, marks the close of his thirty-eight years of active service with the Louisville Railway. His recent advancement is one of many promotions he has won in the service of the railway and interurban company.

R. H. WYATT

Mr. Wyatt, who is one of the veterans of the local street railway and interurban service, was originally employed by the late H. H. Littell, who organized the Louisville Railway. The new superintendent has in his possession a much-prized letter, probably the last that Mr. Littell ever wrote. It is in Mr. Littell's own handwriting and is in the nature of a compliment over the promotion which has just come to Mr. Wyatt.

One of Mr. Wyatt's first hard nuts to crack as the new general superintendent was in connection with the adoption of daylight saving by Louisville, commuters favoring a schedule based on daylight saving, while farmers and shippers wanted standard time. A compromise was reached by rearranging the schedule so that now both the time and the service are satisfactory to all.

Mr. Wyatt's connection with the Louisville transportation system dates back to 1883. His first work was handling the reins of a mule team pulling a car on the Twelfth Street line. Subsequently he became a conductor with the advent of electric cars, and later served as railway inspector. He then became transfer agent and afterwards drew an office assignment. For a number of years he was superintendent of the Highland carhouse and has also served as assistant paymaster.

When the interurban group of the Louisville Railway was formed in 1903, Mr. Wyatt became general express agent on the interurban lines. He has been general freight and passenger agent for the seven lines of the interurban system since the Shelbyville and LaGrange divisions were taken over by the Louisville & Interurban Railway in 1910.

E. I. Lewis and J. D. Campbell Picked for I. C. C.

Nominations of E. I. Lewis of Indianapolis, Ind., and James D. Campbell of Spokane, Wash., to the Interstate Commerce Commission, were confirmed without opposition by the Senate on May 3. The nominations were sent to the Senate by President Harding on April 28.

Mr. Campbell, an attorney, has practiced extensively before the Commission in the Intermountain rate cases. Mr. Lewis has for the past four years been chairman of the Indiana Public Utilities Commission. The selection by President Harding of Mr. Lewis was fully expected, but that of Mr. Campbell came as a surprise.

Mr. McCardle Commission Head

John W. McCardle, Indianapolis. Ind., was elected chairman of the Indiana Public Service Commission on May 2. Mr. McCardle was the unanimous selection of the members of the commission. He was nominated for the chairmanship by E. I. Lewis, retiring chairman, who has resigned from the commission to accept a place on the Interstate Commerce Commission. Mr. McCardle has been a member of the commission for four years and was recently reappointed by Governor McCray for a second term. He has been vice-chairman of the commission and is regarded as one of the ablest men who have been connected with the Indiana utilities body. With the reorganization of the commission Lawrence C. Loughry, Monticello, Ind., has taken office as secretary. He succeeds Frank P. Litschert, former secretary of the Governor, who has held the position temporarily following the resignation of Carl H. Mote. He is a graduate of the Indiana University Law School. Carl Wilde succeeded M. D. Atwater as director of service.

Ralph Stickle Resigns

Well-Known Claims Man of Cleveland Railway to Establish Private Law Practice

Ralph Stickle, assistant superintendent of the accident department of the Cleveland (Ohio) Railway, has resigned to enter the private practice of law in Cleveland. His resignation is much regretted by the operators of the road because of the efficient work that he has done in reducing the accident hazard to a minimum.

Particular study has been made by Mr. Stickle of the automobile hazard, how it may be lessened by the railway companies, autoists and public. He presented a paper on this subject before the Claims Association last October in which he stated that it is the business of claims men to try to make transportation men, autoists and the public realize the importance of this problem and to solve it. Little can be done to relieve the claims department in handling auto accidents except to prevent accidents. In his agitation for safety he recommends the repeal of antiquated anti-trolley legislation and systematic continuous safety work among employees, besides propaganda directed toward the education of the public. Also a great step forward would be taken if we had uniform traffic laws in every state so that the different kinds of traffic could be segregated.

RALPH STICKLE

Mr. Stickle has been with the Cleveland Railway for seven years, having for some time been in charge of the current claim work. He has also been identified actively for several years with the Claims Association and the American Electric Railway Association.

Before taking up the practice of law, Mr. Stickle was a newspaper man. For five years he was the political correspondent at the state capitol at Columbus for the Cleveland *News* and later was departmental editor on Cleveland newspapers. He is a graduate of Western Reserve University and the Baldwin-Wallace Law School.

Mr. Stickle will be succeeded about May 15 by Joseph S. Kubu, who is now claim agent for the Utica lines of the New York Railways.

Mr. McAneny Selects Working Force of Transit Commission

Actual work on the plan to reorganize the transit system of New York city has been started by the appointment by George McAneny, chairman of the new Transit Commission, of Brigadier-General Lincoln C. Andrews as executive officer, Daniel L. Turner as consulting engineer, and three men who will have charge of the work of evaluating the property of the transit companies. The appraisal engineers named include John H. Madden of Brooklyn, valuation engineer; Frederick W. Lindars, chief accountant; and Major John C. Cooper, assistant chief accountant. Also Captain Edward T. Fitzgerald was named acting chief of the Transit Bureau. Five of the new appointees were connected with the old Public Service Commission before the war.

Brigadier-General Lincoln C. Andrews, who has been selected as executive officer of the Transit Commission recently retired from the army. He will have general charge of the new commission's working organization and will, so far as may be necessary, assign its employees to the several divisions or bureaus and superintend the performance of their duties. General Andrews is a graduate of the United States Military Academy. He saw active service in France in the World War and after the armistice became Assistant Provost Marshal General of the Expeditionary Forces.

Daniel L. Turner, who has been appointed consulting engineer to the commission, since 1916 has served as chief engineer under the Public Service Commission, and since 1919 under the Transit Construction Commission. As such he will be the commission's chief advisory engineering officer.

Mr. Madden, selected for engineering head of the valuation work, was assistant division engineer of the old commission and did valuable work in supervising the construction of the new subway in William Street, where many problems new to engineering practice were encountered and successfully solved.

Frederick W. Lindars, now chief accountant, has been a member of the firm of Banks, Haig & Lindars, expert accountants. He also served in a similar capacity with the commission from 1916 to 1919, and organized the Bureau of Accounting, established by the commission to check the expenditures of the Interborough Rapid Transit Company and the New York Municipal Railway Corporation under the new subway contract.

Major Cooper served with Mr. Lindars under the old commission. He resigned in 1915 to enter the military service. Since the war he has been engaged in private business.

Captain Fitzgerald was with the old commission for several years as railway engineer. He served in the navy throughout the war as captain, rejoining the engineering department of the commission at the close of the war. His present assignment will be temporary only, but after he has placed the bureau on a proper footing, he may be used by the commission for similar work in other bureaus.

The fixing of the valuation will be the first move in the program of readjustment and rehabilitation planned by the commission. The work will probably begin this week when the new officials take office.

Mr. McAloney in Atlanta

Well Known Equipment Man Takes Charge of Rolling Stock of Georgia Railways

W. H. McAloney has recently become superintendent of equipment of the Georgia Railway & Power Company, Atlanta, Ga. He will have full charge of shops, carhouses and garage, and will have jurisdiction over maintenance of all street cars and automobile equipment. The appointment of Mr. McAloney was made by General Manager Butler to fill the vacancy caused by the death of Mr. Moore in 1919.

W. H. McALONEY

Mr. McAloney is considered to be one of the leading equipment men in the country. He was for about sixteen years superintendent of rolling stock of the Denver (Col.) Tramway. While there he gained for himself a great many friends and much popularity because of his interest in appliances for the convenience and comfort of the employees. Articles by Mr. McAloney have appeared in the JOURNAL from time to time, dealing particularly with his experiences and suggestions regarding various pieces of railway equipment.

While in Denver he was actively connected with the welfare association of the Denver Tramways. Many times his wise words of admonition to employees were put in the form of maxims. One of these, which was made some years ago and is just as true today, is, "The traveling public is becoming more and more exacting, and the standard of service is continually being raised. Let us try to be faithful, accurate and constant within the limits of commercial error."

Mr. McAloney began work for the Denver Tramways as a conductor in 1891, and after a few months of this work entered the office of E. W. Olds, at that time master mechanic. Soon afterward he was appointed division superintendent of the East Division and later returned to the shops as storekeeper. In 1902 he became superintendent of rolling stock, the position he held at the time of his resignation in 1918.

In July, 1918, Mr. McAloney was appointed superintendent of rolling stock of the Winnipeg (Man.) Electric Railway. He remained in Winnipeg until 1920, when he became associated with John A. Beeler, consulting engineer.

Mr. McAloney's arrival in Atlanta makes the third Winnipeg man to join the operating staff of the Georgia Railways & Power Company. General Manager Butler not long ago directed the operation of the Winnipeg Electric Railway and J. R. Ong, whose appointment to the position as transportation engineer in Atlanta was made known in the April 9 issue of the JOURNAL, held the same title in Winnipeg.

Walter C. Strunk has resigned from the mechanical research and construction division of the Interborough Rapid Transit Company motive power department to enter the service of the Westinghouse Electric & Manufacturing Company, Chester, Pa. Mr. Strunk, after his graduation from Swarthmore College in 1909, immediately entered the Metropolitan Street Railway Company Training School. Two years later he entered the electrical department, and in 1912, when the New York Railways Company was organized, he became assistant engineer in the motive power department of the Interborough Rapid Transit Company and New York Railways Company. His work up to 1917 was in the Economics Division, since which time he has been in charge of all tests and experimental work in connection with mechanical power station equipment.

Edward C. Marshall, Charlotte, N. C., has been elected president of the Southern Public Utility Company by the directors to succeed the late Z. V. Taylor, who died suddenly about a month ago. Mr. Marshall has been treasurer of the company since its organization in 1913, and in that capacity had been the closest associate of Mr. Taylor in the direction and development of the company, his help having been especially valuable in working out the financial problems during the constant expansion and development of its properties. Prior to 1913 he was for a number of years connected in an official capacity with the Southern Power Company, of which the Southern Public Utilities Company is a subsidiary. The latter company operates the street railway, lighting and electric power systems in Charlotte, Winston-Salem, N. J.; Greenville. N. C., and Anderson, S. C., and the power and lighting systems in nearly a dozen other towns in the Carolinas. Its holdings represent an estimated value of about $20,000,000.

Cleveland Engineers Testify at Trenton Hearing

The Board of Public Utility Commissioners of New Jersey is hearing the application of the Trenton & Mercer County Traction Corporation for an increase in fare from 7 to 10 cents. The commission was asked to grant the 10-cent rate on a temporary basis, and later after considering the valuation of the company make a permanent rate.

Peter Witt, Cleveland, Ohio, testified that the company was being saved from financial ruin through the Trenton City Commission withholding its approval of jitney operations. Mr. Witt favored a 5-cent fare between the hours of 8 a.m. and 4.30 p.m., with seven tickets for 49 cents or 10 cents cash during the rush hours. Mr. Witt said that the large two-man cars could be operated as one-man cars, and that he was opposed to jitneys because the burden of taxes was placed on the railway.

Charles H. Clark and Lawrence P. Crecelius, Cleveland, undertook the construction of a theoretical trolley line, competing with the Trenton Company. They said that such a line could be built more economically than the Trenton line. Mr. Crecelius said the company was losing money in supplying power for the cars from the Trenton power house on Lincoln Avenue. He suggested three substations for the distribution of power purchased from some other company. Mr. Clark said that the company's power plant was about 75 per cent efficient.

Victor B. Phillips, Cleveland, was a witness at the hearing on May 10.

Use of One-Man Cars Upheld

The bill introduced in the Massachusetts Legislature to prohibit the operation of one-man cars has been "given leave to withdraw." This bill was fostered by the street cartmen's unions and was strongly backed by the American Federation of Labor. At numerous public hearings every conceivable argument was brought up in support of this proposed legislation against the principle of one-man car operation. The strongest line of attack was on the ground of alleged danger to the public.

While refuting these charges of danger to the public, the railways made the weight of their case on the legitimate economy of the principle of one-man operation, and demonstrated conclusively to the legislators that had it not been for one-man cars many more miles of railway track would have been added to the already large abandonments in that state. Several managers showed that the passage of any anti-one-man car bill would result in the immediate suspension of service on many lines.

The failure of the labor interests to convince the Legislature of the existence of any alleged danger to the public is especially significant, because in Massachusetts hundreds of former two-man cars, double as well as single-truck, have been converted to one-man operation without any of the usual standard manufactured safety devices. The Massachusetts Department of Public Utilities requires only that some well-constructed device be installed accessible to passengers which will permit anyone inside the car to apply the brakes and unlock the doors in an emergency.

Be Wise and Advertise!

The Mitten management is "talking to the public" through the medium of advertisements in the Philadelphia *Public Ledger*. Emphasizing the fact that it deservedly has the support and confidence of the 10,000 employees of the Philadelphia Rapid Transit, it desires similar co-operation on the part of the public.

One of these advertisements says that fifty-two separate companies were originally started to operate street cars in Philadelphia, and each one was authorized to collect a separate fare. The roads were all gradually brought together in order to make possible one big operating company which would carry a passenger throughout the city for a single fare. Under these conditions the company is anxious to co-operate with the people to the end of supplying a car service of which they will have every reason to be proud and which will meet the ever-expanding need of the city.

"President Mitten's new departure in inaugurating a series of talks to the public on the problems, purposes, and hopes of the Philadelphia Rapid Transit Company is an excellent one," says the *Public Ledger* editorially, "and there is nothing more surely calculated to inspire confidence and insure co-operation than a frank understanding between the public utility and the public served by it. If, therefore, Mr. Mitten shall persevere in his announced intention to tell the plain facts about transit matters, he will perform a service to the corporation he serves so well."

Mitten Management Talks to the Public

Investment and Return of P. R. T. and Underlying Companies

	Capital Paid In	Mortgages Bonds, Etc.	Total Paid In	Rentals and Dividends	Interest Etc.	Total Return	Percent Per Annum
As at June 30, 1903	$58,611,380	$ 9,373,569	$ 67,984,949	$6,429,446	$ 670,018	$ 7,099,464	10.44
" " " 1904	64,596,060	9,315,444	73,911,504	6,429,321	671,412	7,100,733	9.61
" " " 1905	67,583,700	10,394,278	77,977,978	6,729,341	713,634	7,442,975	9.54
" " " 1906	68,461,440	20,416,611	88,878,051	6,729,438	1,106,584	7,836,022	8.82
" " " 1907	77,343,520	21,260,794	98,604,314	7,039,026	1,142,123	8,181,149	8.30
" " " 1908	81,909,532	21,207,372	103,116,904	7,047 651	1,141,556	8,189,207	7.94
" " " 1909	86,436,055	24,875,039	111,311,094	7,347,661	1,214,203	8,561,864	7.69
" " " 1910	86,436,055	26,019,039	112,455,094	7,356,786	1,337,468	8,694,254	7.73
" " " 1911	86,438,500	27,659,019	114,097,519	7,358,342	1,429,026	8,787,368	7.70
" " " 1912	86,438 500	29,432,019	115,870,519	7,365,980	1,460,387	8,826,367	7.62
" " " 1913	86,440,255	33,945,317	120,385,572	7,364,939	1,640,345	9,005,284	7.48
" " " 1914	86,440,255	39,167,817	125,608,072	7,364,635	2,008,192	9,372,827	7.46
" " " 1915	86,440,255	41,052,811	127,493,066	7,364,997	2,089,759	9,454,756	7.42
" " " 1916	86,440,255	40,594,811	127,035,066	7,964,443	2,139,062	10,103,505	7.95
" " " 1917	86,452,965	39,760,811	126,213,776	8,864,670	2,108,346	10,973,016	8.69
" " " 1918	86,453,040	39,142,811	125,595,851	8,865,181	2,097,999	10,963,180	8.73
" " Dec. 31, 1919	86,453,040	42,653,867	129,106,907	8,863,206	2,251,736	11,114,942	8.61
" " " **1920**	86,453,040	42,841,819	**129,294,859**	7,366,490	2,336,620	9,703,110	**7.50**

$30,000,000 of this money, paid in by P.R.T., made possible the building of the Market Street "L," which the Philadelphia Real Estate Board says has more than doubled values of adjacent real estate in West Philadelphia. The real estate owners, by increased values, and the City of Philadelphia, by increased taxes, have benefited from the building of the Market Street "L" much more than the P.R.T. stockholder.

The increase in city assessments proves that $129,294,859, if invested in city real estate during this period, would have brought much greater returns to the investor

What inducement can be offered the investing public to secure from them the new money now required for further transit development?

No. 3

PHILADELPHIA RAPID TRANSIT COMPANY
T. E. Mitten, President.

PHILADELPHIANS ARE INFORMED OF MITTEN MANAGEMENT BY THIS TYPE OF AD

Only 3 per Cent of Boston Traffic Pays Five-Cent Fare

Edward Dana, general manager of the Boston (Mass). Elevated Railway, testifying before the New Jersey Board of Public Utilities, in the fare case of the Public Service Railway, outlined the policies of the Boston trustees and the results of their experiments with reduced fares.

Local riding has increased approximately 78 per cent on the Malden and Everett lines of the company, where a 5-cent fare for short hauls has recently been instituted. This is an experimental service instituted by the trustees for the purpose of endeavoring to regain the short-haul traffic lost since 1917 by the various increases in fares from the original 5-cent rate to the present 10-cent fare.

The decrease in total revenue passengers since 1917 has been 40,000,000, or about 12 per cent, according to Mr. Dana's testimony. The theory of the management, he explained, is that this loss took place not in the regular daily tidal traffic from the suburbs to the business center, but rather in the local rides in outlying communities; also possibly to some extent people living within the mile and a half zone from the center have been walking since the advent of higher fares. It is with the desire to regain some of this short-haul traffic without infringing on the revenue received from the regular 10-cent fare traffic that the trustees are trying out various 5-cent fare lines.

At present, he stated, 2.9 per cent of the total revenue passenger traffic of the system is being carried for a 5-cent fare, the balance all paying 10-cent fares. The 78 per cent increase in local riding in Malden and Everett is considered encouraging, but it must be further increased to 100 per cent to equal the revenue received from the local 10-cent fares before the 5-cent fare went into effect. Mr. Dana also said that the failure of the town authorities of Malden to aid in removing a competing jitney line may cause the abandonment of the experiment in that locality. They have also found, he said, that the three short 5-cent lines operating into the business district of Boston are doing a large business, with car mile earnings above the average for the system, but they have also taken traffic from the 10-cent lines.

Jersey Argument Closed

The appeal of the Public Service Railway, Newark, N. J., for a 10-cent fare is now formally before the Board of Public Utility Commissioners of that State. Concluding argument by counsel was made at Newark on May 5.

George L. Record, special counsel for Jersey City in charge of the case for the municipalities, charged the company with operating inefficiently. This was the basis of his whole argument.

Edmund W. Wakelee, counsel for the company, said that the 10-cent fare was the only rate that could afford adequate relief. It was difficult, according to him, to argue a case where there was so little to argue about. He said in conclusion:

> The statements and estimates of the company are not in dispute. The controlling principles of law are fixed and certain. That relief is necessary is incontrovertible, and the 10-cent rate is the only rate that can afford adequate relief. The company, therefore, confidently appeals to this board to dispose of this pending application in such a manner as to meet this critical situation and to effect substantial justice so far as it is possible to do so.

New Orleans Hearing Delayed

After a conference between State Attorney-General A. V. Coco and H. Generes Dufour, representing the New Orleans Railway, a motion was made by the Attorney-General for a continuance on the hearing of the application of the New Orleans Railway & Light Company for an injunction restraining the state from beginning legal proceedings against enforcement of the 8-cent fare. Judge Foster, of the Federal District Court, granted the continuance asked for till May 16, but upheld the temporary restraining order.

Announcement is made that the city of New Orleans will delay its answer to the injunction proceedings instituted against it by the receiver of the New Orleans Railway & Light Company until after the adjournment of the Constitutional convention. It will be recalled that there is now pending in the Federal Court an order restraining the city from interfering with the receiver in the collection of an 8-cent fare.

In the order of Judge Clayton, who issued a temporary injunction upon the request of the receiver, the city had twenty days from April 21 within which to file an answer.

City Attorney Kittredge is a delegate to the Constitutional Convention now in session and postponement was asked for by him after a conference had with H. Generes Dufour, counsel for the receiver. This action will, of course, delay the hearing thirty days.

Transportation News Notes

Interurban Fare Rise. — Passenger fare rates on the Fort Wayne, Van West & Lima Traction Company, operating between Lima, Ohio, and Fort Wayne, Ind., will be increased 10 per cent beginning June 1.

Beeler Rerouting in Effect.—Rerouting under the Beeler plan was begun on the system of the Kansas City (Mo.) Railways on May 1. The ordinance providing for the readjustment had been passed by the City Council, and was approved by the Public Service Commission, with little controversy or opposition. In the first few days of operation of the lines on which rerouting was begun there was no complaint, and there was the expected improvement in efficiency and economy. Rerouting will probably cover a period of several months.

Coach Company Says "Thank You."—The Fifth Avenue Coach Company, New York, N. Y., recently published its "Thank You" to the public in appreciation for various letters of commendation received from its patrons. The letters, some of which are reprinted in this pamphlet, relate a real experience with a courteous conductor or with a skillful driver. A practical example of recognition for accommodating service on the part of its employees is shown in the company's recent announcement of an increase in pay which the men will hereafter receive.

Wants Two-Cent Transfer Charge.—The increase in fare to 6 cents, with twenty tickets for a dollar and a 1-cent transfer charge, is not helping the financial condition of the Indianapolis Street Railway, its officials say, and when the thirty-day probation period has been completed on May 18 and the company again appears before the Indiana Public Service Commission it will ask for an additional 1-cent transfer charge. The general industrial depression, with its consequent unemployment, has decreased the number of passengers riding the cars daily to such an extent that the increase in rates is not holding the company even. Last year an average daily haulage was about 300,000 passengers. This year there are many days when less than 250,000 are riding. The company will ask authority to charge 6 cents, with twenty tickets for a dollar and 2 cents for a transfer.

Jitneys Use Metal Tickets.—The Milwaukee Bonded Carriers' Association, an organization of jitney men operating in Milwaukee, Wis., has recently commenced selling aluminum fare checks at the rate of seven for 50 cents. Checks purchased from any of the operators will be good for one ride on any jitney run by a member of the association. The new rate will be a reduction of 1 cent from the old jitney cash rate of 8 cents. The new cash rate will, however, be 10 cents. The railway rate is 7 cents cash, or eight tickets for 50 cents. Jitney operation in Milwaukee is regulated by state law and is under the supervision of the Wisconsin Railroad Commission. Permission must be obtained from the commission before a jitney can be operated in Milwaukee, and even after such permission has been obtained the commission continues to supervise the operation and sees that the routes assigned to an operator are adhered to and that he follows its regulations in other ways.

A Practical Application of Selling Transportation.—The Georgia Railway & Power Company, Atlanta, Ga., has capitalized some of the ideas expressed by President Arkwright in his recent address, "Don't Hate Your Customers," which was printed in the ELECTRIC RAILWAY JOURNAL for April 23, 1921. Two cardholders are to be installed in each car reading: "This car in charge of Conductor —— and Motorman ——." Each trainman will be furnished a slide bearing his name, which is to be inserted in the holder while he is on duty so that his customers may become familiar with his name and address him by it. The company is also endeavoring to teach the men the advantages of doing business in a way that tends to introduce a little personality and urges the men to greet their customers with a good morning or good evening as the case may be when they board their car. While the company does not make this the subject of a general order it is suggested to improve the standard of work.

Sustains Seven-Cent Fare. — The Pennsylvania Public Service Commission has refused the application of the Pennsylvania-Ohio Electric Company for permission to charge a 10-cent fare in New Castle, and has ordered a continuation of the 7-cent cash fare with six tickets for 40 cents and twenty tickets for a dollar with free transfers. The Sharon & New Castle Street Railway, which operates the local railway in New Castle, recently filed a new tariff of rates with the commission. The commission believes in a community like New Castle where there are many "short-haul" riders it would be a mistake to put a straight 10-cent cash fare into effect. The commission says in the event of an advance in the cash fare the short riders would be the ones to refrain from using the cars, and the company, in order to obtain the maximum amount of revenue and render the public service it is under obligation to perform, should make every effort to retain its short riders. It is also said "the policy of seeking to obtain a given amount of revenue by the rendition of service to a reduced number of patrons at a higher rate is not in harmony with proper utility service regulation and is also inimical to the accommodation and convenience of the public."

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Another Coal Shortage Impending?

Production Is Still Low, Consumers' Stocks Are Decreasing, but More Interest Is Displayed

Despite present light demand for coal and the prevailing promptness of railroad deliveries considerable discussion continues to be heard regarding prospects of another coal shortage this fall and winter. According to the May 12 issue of *Coal Age*, C. H. Markham, president of the Illinois Central Railroad, is advertising in newspapers in the Middle West warning the public of an impending coal shortage because, "as one of the largest coal-carrying roads in the Middle West," he considers it a duty to sound this warning. He plainly states that the country is headed for a serious bituminous coal shortage. At the same time Senator Elkins, in a statement issued from Washington, emphatically declares that a "sudden restoration of the market and an attempt to crowd the hauling of the bulk of the nation's coal into the autumn and winter months will place upon the railroads a burden which they are admittedly unable to discharge adequately."

Production Has Increased Lately

Production of soft coal during the last three weeks of April started an upward climb from the low point of about 6,000,000 tons per week to nearly 7,000,000 tons. This increase in production followed a steady decline in output that began last December, and it must be remembered that even the present rate of operation is still lower than at any time since April, 1914, except for the period of the coal strike in 1919.

Stocks of bituminous coal in the hands of consumers in this country as of April 1, 1921, are estimated at about 37,000,000 tons by the Geological Survey. This represents a decrease of about 8,000,000 tons in the stocks held by consumers on Jan. 1, 1921. As current consumption and exports are doubtless in excess of current production the draft on consumers' stocks still continues.

The contract market remains dormant as quotations are too far above spot coal prices to attract buyers. Producers hold to their prices firmly, however, and refuse to close business on a yearly basis unless granted a figure which assures them some profit. The spot market, on the whole, is perhaps a little more active. A "busy early" campaign to encourage stocking coal has stimulated business in the Middle West, and in New England buyers seem to be getting over their indifference too. There was a distinct revival to the export market the latter part of April. Throughout the country the decline of consumers' stocks is causing buyers to keep more actively in touch with the market even though they are not taking a heavier volume of coal.

Some purchasers are apparently holding off in the hope of a drop in freight rates. Even if this should materialize in time to care for a considerable tonnage before the expected fall rush may develop, however, it still seems hardly likely that there is prospect of a drop large enough to justify holding back purchases.

Better Sentiment Indicated by Business Conditions

Fewer Failures, Lower Discounts and Easier Money, Lower Prices and Wages, Less Unemployment

It seems apparent that a turn for the better and a change in business sentiment are indicated in some items of general business news. In April the failures showed a falling off for the first time in a great many months. Dun's, Bradstreet's and all of the large banks are now seeing hopeful signs in current business conditions. Federal Reserve Bank discounts are being lowered. This is occasioned by easier money and in turn has the effect of making money still easier, after which building prospects are brighter.

The number of idle freight cars is decreasing — although the decreased number is made up entirely of freight cars, nevertheless, if more coal is being moved, is it not indicative of a belief on the part of industry that greater production is soon due?

Almost all business commodities are now down to a level which, while not in all cases equal to the pre-war level, still is of sufficient lowness to warrant resumption of activities on a fair scale. Steel is down and steel wages with it. The only item that is seen to be up is the item of freight, and pressure is now being brought to bear on that. It would not be unreasonable to expect lower freight rates within sixty days.

Non-employment in April was about the same as in March. Some industries show great lack of employment, but many industries show that non-employment is lessening. The indications are that from now on the numbers of unemployed can be expected to decrease.

There seems to be one answer—that business is now on the beginning of the floodtide. He who waits until the tide is full to cultivate this business will probably find that he has lost the momentum of being carried along on the wave.

Stock Deliveries of Standard Size Gears and Pinions

Buying Is Light, Both for Repairs and New Cars, but Is Expected to Increase Gradually

Manufacturers of railway motor gears and pinions have for some time been completely caught up on orders and at the present time are carrying a considerable quantity of standard sizes in stock. Immediate shipments can therefore be made on these, but where special gear blanks have to be ordered for finishing, deliveries range as long as three weeks to four months. Present production in this field is about on an average of 50 per cent of capacity. Some manufacturers are operating a full force of workmen on half time, others have reduced their shop force and the number of working hours per week in about equal proportion.

Demand for gears and pinions this spring is quite uniformly reported to be much below normal. Customers are existing from hand to mouth and repair orders are placed only as is absolutely necessary. With the period of long deliveries well past there is of course little necessity now for a railway to stock gears and pinions. Orders on behalf of new cars are almost negligible for the reason that car builders are still well stocked with motors purchased last year and motor manufacturers are producing only at about one quarter of their capacity.

Reductions Not Uniform

Prices in this field are trending downward in view of labor and material reductions. Wages have been cut as much as 15 per cent in some instances, while in others war-time prices still prevail. Consequently the price situation varies among different producers, one, for instance, reducing both gears and pinions about 5 per cent the first of last month, a drop of about 10 per cent from the peak, while another manufacturer has made about a 10 per cent decrease on pinions but has not reduced gear prices. The reason for this, it is stated, is that the cost of raw material on gears has not come down appreciably. With the reduction in steel prices and the cut in wages recently put into effect by the United States Steel Corporation, however, it would not be surprising to see a reflection of this upon gear and pinion quotations before long, especially where labor readjustments have not yet been made.

In general a gradual resumption of business is anticipated in this field the balance of the year, but a fairly brisk demand is not expected to materialize before the fall.

Some Activity in Fare Register Market

Some Decrease Recently in Normal Demand Felt Early This Year—Prices Are Unchanged and Shipments Are Prompt

Sales of fare registers during the first two months of this year, usually a slack period with manufacturers, are reported to have held up well to the standard of a year ago. Recently there has been some falling off in demand, it is true, but the market shapes up well in comparison with other classes of railway equipment when the long life and small cost of the fare register per car is taken into consideration.

Stocks of raw material are large, too much so in some instances. Manufacturers are not overstocked on the finished product but hold a sufficient supply to insure prompt shipments. With the falling off of business noted above, production has been cut down and now is such that a great many more registers could be turned out if necessary, especially where additions to plant have been made.

MATERIAL AND LABOR BOTH DOWN

Wages in this field have generally been reduced from 10 to 20 per cent and further cuts may be made, it is stated, at such time as conditions warrant. Material has come down in cost on an average of 20 to 25 per cent, too. In a representative instance, however, the average price of fare registers in 1920 stood about 75 per cent higher than in 1914, while costs went up approximately 110 per cent during the same period. Therefore though prices in this line have not been reduced, quotations on last year's basis are still lower in proportion to cost than in 1914. If material and labor come down further, however, producers will be in a position to reduce selling prices, it is stated. The cost of renting fare registers, where cars are equipped on that basis, shows no reduction either, since renting prices were maintained throughout the war period without change.

Regarding the general outlook for business in this field, producers are reducing expenditures to the lowest possible level on the expectation that a return to brisk business will not occur for some time to come. Revision of Federal tax laws and the release from wage agreements with railway employees are two things specifically mentioned as needing remedy before the situation will improve.

Small Electrification Projected in Brazil

According to advices from the American Consul at Rio de Janeiro, Brazil, part of the railroad at the Itabira de Matto Dentro iron mines will be electrified in conjunction with the project for electrical equipment of those mines, for which a hydro-electric plant will be installed on the Piracicaba River, in the State of Minas Geraes.

Rolling Stock

The City of New York, N. Y., through an appropriation of $56,000 granted on May 6, has authorized Grover A. Whalen, Commissioner of Plants and Structures, to purchase trackless trolley cars to be placed in operation on Staten Island within the next sixty days. Eight cars will be operated over two routes, one from Meier's Corner to Linoleumville, a distance of 2½ miles, and the other from Manor Road to Seaview Hospital, a distance of 4 miles.

The Monongahela Valley Traction Company, Fairmont, W. Va., has recently purchased a new 50-ton Class B Baldwin-Westinghouse locomotive, a duplicate of locomotive No. 2,000, installed about two years ago, to handle carload and package freight business. It is equipped with four type 562-D-5, 100-hp., 600-volt, field control motors and double-end HL control. It will be used for general utility haulage as this company does extensive business on a steam railroad basis of operation. The general characteristics of this locomotive are as follows:

Weight	50 tons
Maximum tractive effort (25 per cent adhesion)	25,000 lb.
Normal tractive effort at 9.7 m.p.h. (full field 1 hour)	15,200 lb.
Continuous tractive effort with forced ventilation (short field)	9,000 lb.
Maximum trailing load starting on ½ per cent grade	860 tons
Balancing speed (short field at 600 volts) on level with 500-ton trailing load	17.5 m.p.h.
Balancing speed (short field at 600 volts) on 3 per cent grade with 200-ton trailing load	10.5 m.p.h.

The United Railways and Electric Company of Baltimore, Md., mentioned in last week's issue as placing an order for ten safety cars, has issued the following information and specifications on these cars:

Number of cars ordered	Ten
Date of order	April 25, 1921
Delivery	Sixty working days
Builder	The J. G. Brill Company
Type of car	Safety; double door
Weight, total	17,000 lb.
Length	31 ft. 1 in.
Truck wheelbase	8 ft. 0 in.
Width	7 ft. 10⅜ in.
Height, rail to roof boards	9 ft. 10⅝ in.
Body	Steel
Interior trim	Cherry
Roof	Arch
Air brakes	Westinghouse
Bumpers	Three-inch channel
Car signal system	Faraday
Control	Safety Car Devices Company
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Designation signs	Hunter
Door operating mechanism	Safety Car Devices Company
Fare boxes	Johnson
Fenders or wheelguards	H. B. wheelguards
Gears and pinions	Nuttal, helical
Hand brakes	Peacock
Heater equipment	Consolidated Car Heating Company
Headlights	Dayton Mfg. Company
Journal boxes	Brill
Motors, type and number	Two Westinghouse 508, inside hung
Registers	International R7
Sanders	Ohio Brass Company
Sash fixtures	Brill
Seats	Brill
Seating material	Wood slats
Slack adjuster	Gould
Trolley catchers or retrievers	"Q P" catchers
Trolley base	U. S. No. 6
Trucks	Brill
Ventilators	Brill
Wheel (type and size)	26-in. rolled steel

Youngstown (Ohio) & Suburban Railway Company has recently placed in service a standard class B, 45 ton, Baldwin-Westinghouse locomotive. It is equipped with four type 562-D 5, 600-volt, 100-hp., field-control motors and HLF control. The new locomotive is required to handle the increase in the company's car load freight business.

Franchises

Linnton, Ore.—The City Council of Portland has assured residents of Linnton, a suburb of Portland long without car service, that a franchise will be granted for a railway to that district if the promoters of the proposed line give the city assurance that they will carry the project to completion. An application for a franchise for a line from Linnton to Portland was filed with the Council by J. B. Shaefer and others and was referred to City Attorney Grant with instructions that a franchise with clauses safeguarding the public be prepared and brought before the City Council. Before a franchise can be granted it must be advertised for a period of 60 days. The promoters of the proposed line have obtained a franchise from the County Board of Commissioners for the construction of the line from Linnton to Oilton, a distance of three miles. It is proposed to operate over the lines of the United Railway from Oilton to Twelfth and Burnside Streets, under a common-user clause. The city is asked to grant the franchise from the city limits to Twelfth and Burnside.

Track and Roadway

San Francisco-Oakland Terminal Railways, Oakland. Cal.—The San Francisco-Oakland Terminal Railways has applied to the city for permission to double-track their line on Park Boulevard, a distance of one-half mile.

Toronto, Can.—No contracts for track reconstruction in Toronto will be let until after the commission takes over the railway system in September next. The commission has decided not to change the existing gage which is 4 ft. 11 in., against the standard 4 ft. 8½ in. of the radials, owing to the tremendous expense this change would incur.

British Columbia Electric Railway, Vancouver, Can.—The British Columbia Electric Railway has started work on the relaying of tracks on Government Street, Victoria.

Los Angeles (Cal.) Railway.—The Los Angeles Railway has started improving Maple Avenue. The track wlil be reconstructed with new 116-lb. girder rails between Washington and Thirty-second Streets and on Thirty-second Street between Santa Barbara and Wall.

Worcester (Mass.) Consolidated Street Railway.—The Worcester Consolidated Street Railway is planning track repair work on Millbury Street and on

South Main Street. According to the general manager there are other improvements which the company would like to undertake and which would cost about $300,000, but unless receipts warrant it these improvements will have to be deferred.

Morris County Traction Company, Morristown, N. J.—The Morris County Traction Company will relay the tracks in Wharton. The Morris County Freeholders will help relay the tracks and pave the street and charge the costs to the traction company, collecting it at the rate of $10,000 a year. The work will cost about $40,000.

Dayton & Troy Electric Railway, Dayton, Ohio.—It is expected that the Dayton & Troy Electric Railway will lay heavier rails through Troy, Ohio, in which event the entire track will be torn up and the right of way repaved with brick.

Portland Railway, Light & Power Company, Portland, Ore.—The Portland Railway, Light & Power Company is planning to start extensive work on repairs of its tracks on First Street. Approximately $36,000 will be spent on First Street, including the reconstruction of considerable trackage.

Portland Railway, Light & Power Company, Portland, Ore.—The Portland Railway, Light & Power Company is planning extensive improvements on its interurban lines during the current year. The items include contract for the replacing of more than 50,000 ties, repairing of pavement in Oregon City, new station facilities on the Oregon City line at Oak Grove, maintenance work on bridges and trestle. It has been announced that the outlay will be about $200,000.

Pittsburgh (Pa.) Railways. — The Public Service Commission of Pennsylvania has abolished four grade crossings on the Pittsburgh & Charleroi Street Railway operated by the Pittsburgh Railways.

Saskatoon (Sask.) Municipal Railway.—Tenders addressed to the city commissioners, Saskatoon, were received until May 2, 1921, for approximately 5,000 ties for the Saskatoon Municipal Railway.

Houston, Bay Shore & Texas City Interurban Railway, Houston, Tex.—Construction work on the Houston, Bay Shore & Texas City Interurban line began about April 25, according to an announcement by E. Kennedy of Houston, Texas, president of the line. The first unit of the line to be built, Mr. Kennedy said, would be the section beginning at Main Street, Houston, and extending to the San Jacinto Battleground, a distance of 18 miles down the Buffalo River. It is estimated that this section can be built at a cost of $25,000 a mile, although Mr. Kennedy said some bids received were as low as $23,000 a mile. This railway was organized several months ago.

Utah-Idaho Central Railroad, Ogden, Utah.—Although proposed extensions of the Utah-Idaho Central Railroad from Preston, Idaho to Grace, Idaho, and possibly to Bancroft, have been urged by citizens of those cities, plans for the extension will not be considered until possibly next year, according to officials of the company. However, it is expected that steps to improve the road and to extend the lines to Grace and Bancroft, and possibly to Pocatello, will be taken in another year.

Trade Notes

Automatic Ventilator Company, New York City, manufacturer of car ventilators, has removed its offices to 25 West Broadway.

C. H. Wheeler Manufacturing Company, manufacturer of condensers, pumps, water cooling apparatus, etc., announces the removal of its New York City office to 50 Church Street.

Electrocar Corporation, 501 Fifth Avenue, New York City is the new name of the Berg Electric Car Company, which plans to manufacture buses for use in conjunction with electric railway systems.

The Electric Motor Repair Company, 627 Myrick Building, Springfield, Mass., has established a separate brush department in its organization and will henceforth market its carbon brushes under the trade name "Mohawk carbon brushes."

The Ross Heater & Mfg. Company, Inc., Buffalo, N. Y., announces the opening of a branch office in the New York City district, at 2 Rector Street, its sales agency being discontinued. C. M. Hardin, formerly located at the home office, will be in charge.

Gold Car Heating & Lighting Company, announces the removal of its offices and warehouse on May 1 to Bush Terminal, 220 Thirty-Sixth Street, Brooklyn, N Y. The company will now have much larger quarters and greater facilities for handling large orders.

Signal Transformers for Melbourne.—The Victorian Railway Commissioners, Spencer Street, Melbourne, Australia, will receive tenders until June 15 for fifty oil-immersed, single-phase track and signal transformers for power signalling (contract No. 33,901).

The Michigan Stamping Company, having absorbed the Toledo Metal Products Company, has moved from Toledo to Detroit, where it will be located at Mack Avenue and Terminal Railroad. Greatly increased manufacturing space will be afforded for production of the company's line of stamped steel outlet boxes.

The Power Specialty Company, New York City, manufacturer of superheaters, economizers and oil stills, has opened new offices in Kansas City, Mo., 512 Reliance Building and in Dallas, Tex., 627 Linz Building. The Kansas City office is in charge of William F. Meyer, who for the last two years has been attached to the Chicago sales office. The Dallas office is in charge of M. W. Brown.

The Peerless Equipment Company, Hanover, Pa., has purchased the entire business of the Electrical Manufacturers' Equipment Company, Chicago. This includes the manufacturing and selling of "Segur" coil-winding tools and allied equipment. This line will be combined with the line of "Peerless" armature repair tools, which business has recently been purchased by the Peerless company from the Manley Manufacturing Company, York, Pa. The Electric Service Supplies Company will continue to act as exclusive selling agents for the Peerless Equipment Company.

New Advertising Literature

Cranes.—The Universal Crane Company, Cleveland, is distributing bulletin No. 11, describing the Universal cranes.

Transformers. — Bulletin 2005 describes "Pittsburgh Power Transformers" of the Pittsburgh Transformer Company, Pittsburgh.

Oil Engines.—The Anderson Foundry & Machine Company, Anderson, Ind., is distributing a folder describing its type "K" Anderson oil engines.

Insulators.—The Hopewell Insulation & Manufacturing Company, Hopewell, Va., has recently published catalog No. 1, covering its types of insulators.

Evaporators. — The Griscom-Russell Company, 90 West Street, New York City, is distributing bulletin No. 330, the Reilly self-scaling evaporator.

Coin Counters.—The C. J. Root Company, Bristol, Conn., has compiled a book, "The Census Takers of Industry," descriptive of coin-counting operations.

Electric Hoists.—The Sprague Electric Works of the General Electric Company, 527 West Thirty-fourth Street, New York City, have issued bulletin No. 48,967.

Lubrication.—"Turbine Lubrication," Part 2, is the subject of the leading article in the April, 1921, issue of *Lubrication* published by the Texas Company, 17 Battery Place, New York City.

Turbo-Generator Sets.—"Turbo-Generator Sets" is the title of bulletin No. 28 recently issued by the Ridgway Dynamo & Engine Company, Ridgway, Pa., in which it describes the latest improvements, including its pneumatic governor.

Oil-Heating Apparatus.—The Power Specialty Company, New York City, has published a forty-page bulletin on the results of investigations on the requirements of oil-heating apparatus with a view to developing a more efficient type of still.

Stokers.—The Combustion Engineering Corporation, 43 Broad Street, New York, has issued bulletin C-2, describing the Coxe stoker. The company is also distributing two pamphlets, one entitled "Use of Pulverized Coal Under Central Station Boilers" and the other "Powdered Coal Application to Four 2640-Hp. Boilers."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

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A Number of Celebrations Were Held on May 4

THE prominence that was given to National Electric Railway Day by the newspapers generally throughout the country on May 4 and 5 indicates the importance in which the industry is held by those who deal in publicity. The committee on publicity is to be congratulated on the success of its national advertising. It was a notable achievement in so short a space of time to enlist the support of so many companies and to have them successfully stage demonstrations of one sort or another. That this was possible shows a realization on the part of the industry that up-to-date merchandising methods bring results. Few believed that National Electric Railway Day could attract such widespread attention. But when virtually all the papers of the country carried either a national or a local story of the development of the electric traction industry the effort was well worth while. The effect on each property of thus recalling the history of the enterprise to the people's memory must be beneficial. It should result in a better general understanding of the railway's problems, help to change walkers to riders and conduce to a more sympathetic attitude on the part of the public toward the railway's affairs. Means which will bring about these results are worthy of encouragement.

Keep the Coal Moving from Mine to Power-House Bunker

THE National Coal Association is making a strenuous effort to stimulate prompt buying of coal, as the demand during the past four months has been "off" to an alarming extent. As the producing companies have practically no storage facilities this means that there is an accumulated deficiency in production, which will necessarily cause congestion later. The movement will remind electric railway men of the paper read at the Atlantic City convention last October by Eugene McAuliffe of the Union Colliery Company, St. Louis. He explained clearly the coal problem as it is viewed by the producer. He showed how the consumer exerts a powerful influence on the cost and adequacy of coal production, and advocated legislation which would provide for a seasonal variation in freight rates to induce flow at times of otherwise light demand. He showed, also, that the *bête noire* of the coal business is this light demand during the first few months of the year, which is illustrated to an extreme degree by conditions in 1921.

The Coal Association seeks to lay the burden for present conditions on the consumers, but the latter, at least as far as the electric railways are concerned, are justified, to a considerable extent, in "passing the buck" back again. A buyers' market has replaced the sellers' market which existed during and immediately after the war, putting the electric railways in a better position than they occupied formerly. They will undoubtedly, however, co-operate in a movement to cause uniformity in coal demand, but the producers must so adjust prices as to overcome the present obstacles as to the placing of orders. The railroads have an important part to play here also. Granted, however, that the electric railways are convinced that all is being done by the mines and railroads that can be done, then they are justified in storing the maximum possible quantities of coal, for they will profit in the end financially and otherwise when the mines operate with greater regularity.

Coal Demand Is Affected by Many Considerations

THERE is no doubt it is desirable to keep the coal mines operating and the coal moving. But what are the factors involved? In this connection three main questions arise: First, why is the demand so light this spring? Second, can electric railways buy more coal now than they require for current needs? Third, what economic forces can be modified to improve the situation as a whole?

As to the first question, undoubtedly the situation is a reaction from the condition of last year, when the supply which could be delivered was far less than the demand, and prices soared. Prices are lower now and the former car shortage has been replaced by a surplus, but the consumers do not buy. There are several factors in this which may be suggested by these possibilities: There may not have been a price drop considered to be commensurate with what is justified by conditions, even though prices are now lower than those set by the coal administration during the war; the actual conditions may not be fully understood; there may be lack of confidence in the stability of prices; the financial stringency may cause a willingness to "take a chance" as to higher prices and possible later shortage; there may be some apprehension as to ability to store much coal without serious loss and some question as to the economy of investing money for this purpose; there may not be any conviction that present lack of demand means later shortage.

As to the second question, the electric railways already do a great deal in the way of storing coal. Investigations made by the American Electric Railway Association indicate that on the average about six weeks' supply is carried. The coal requirements of the electric railways are rather uniform, but they naturally need a reserve to insure continuity of service and they desire to take advantage of any money saving which is within reach. Hence they have considered storage a desirable part of their power-plant program. Probably they can stretch their storage space a little if they can see their way clear to buy coal to fill it.

After all, the principal way in which the electric railways can help the producers is indirect rather than direct. Nationally the electric railways now "cut quite a figure," much more so than before the war. Thus they are in a position to help, more perhaps than formerly, any practicable scheme for improving the coal situation. They can keep the subject prominently before their constituency and can join as an industry with other great coal-consuming utilities and with coal producers and transporters in removing unnatural barriers to the production, carrying and utilization of that basic necessity, coal.

Conditions Are Better on Several Typical Properties

CORROBORATION of the cheerful outlook for the future reflected in the recent figures of earnings of the electric railways as made public by the American Electric Railway Association is to be found in the returns which are contained in the annual reports of the individual companies for the year ended Dec. 31. These reports are now being received for review and almost without exception they show that the corner was turned some time ago. This does not mean that trying times are over. Far from it. But the returns coming in do indicate most healthy growth in gross receipts, with expenses within bounds and the prospect bright for operation in the future at lower cost.

An example or two will suffice. All the roads examined show healthy growth in gross. In one or two instances, in fact, this growth has been phenomenal. Thus one strictly interurban road shows an improvement in gross over the previous year of about $1,000,000, while the net increased only $46,000. This seems disproportionate. It is. The cheering fact, however, is that the growth of the business has been substantial and may reasonably be expected to remain constant and even to go on increasing, while there is every prospect that expenses will be reduced through decreases in operating costs, with the result that the spread between gross receipts and expenses will widen.

On another property doing a combined city and interurban railway and lighting business the gross earnings have grown from $10,521,000 in 1913 to $21,350,000 in 1920. The increase in the receipts on the interurban lines in this period has been 99 per cent and on the city lines 52 per cent. The operating ratio, which in the case of this company is always quoted inclusive of taxes, has gone from 58.8 per cent to 72.7 per cent. Even so, a return to the average operating ratio of about 60 per cent would mean a difference to the benefit of the company of more than $2,000,000. Many there are who will be apt to say that it is too much to expect an early return to the old operating ratio, yet the prospects for this property most certainly appear bright.

On still another property a saving of more than $1,000,000 was brought about at one fell swoop by a recent reduction in wages. It may be that much of the money thus saved will find its way back into the property in the nature of improvements. Even if it does, the equity of all the security holders will be increased just that much and the financial credit of the company will be bettered accordingly. Sight must also not be lost of the fact that the prospect for the further easing of money rates in the near future should result in no inconsiderable saving in interest charges to companies, when refunding is carried out of borrowings negotiated at high interest rates during the wartime competition for loanable funds. Moreover, the better morale now everywhere apparent is an advantage very often incalculable in the form of dollars and cents, but not intangible in a case such as that at Kansas City, where 900 fewer employees are this year employed in operating the largest number of cars in the history of the company.

Reports of a group of syndicate properties widely scattered geographically confirm what has been said previously with respect to the outlook of the individual properties to which reference has been made. True, the recent depression in business has affected adversely to some extent the gross receipts of a number of companies, but with a revival in trade and lower cost for labor and supplies, all companies ought soon to be in a much more healthy condition. Here and there a manager still struggling fiercely with the problem of making both ends meet may be inclined to think we are chasing rainbows, but that will be only because he has been so deeply employed in trying to steer his own ship home safely through the fog that the ray of sunshine which is penetrating the mist in the distance has not yet been discernible to him.

Serviceable Use Found for Mr. Edison's Questions

AIDED and abetted by the Encyclopedia Britannica, the Book of Knowledge, Young's Astronomy, Bartlett's Familiar Quotations and Montgomery's American History anybody can answer the question, "Who was Marion?" and a lot of others propounded by Mr. Edison. It is an advantage, of course, to be well informed, and even the encyclopedic mind has its utility, but, as Spencer held, it may be said that education has a much higher function than developing in its recipient the ability glibly to answer questions about a lot of unrelated subjects. More particularly it is hard to see the value of questions such as Mr. Edison has propounded if applied in a test to determine the qualifications of an applicant for the position of a motorman or conductor or one seeking a job in the engineering, accounting or legal department of a railway.

Other doubting Thomases have also come forward. Among them is none other than Frank Hedley, president and general manager of the Interborough Rapid Transit. Mr. Hedley is peculiarly well fitted to judge. A graduate of the school of hard knocks, he knows the weaknesses of both the self-educated man and the college graduate, but he comes out strong, all other things being equal, for the man with collegiate training. It is Mr. Hedley's opinion, based on experience, that the man cannot be held down who does things a little better than some one else. Failure to answer questions such as Mr. Edison has set us as a standard will never daunt the ambition of men who are bent on being well informed on their chosen work or the work into which fortune, good or ill, has cast their lot. The views of Mr. Hedley on measures and men as expressed by him recently before the Cornell Society of Engineers are noted elsewhere in this issue.

While Mr. Edison's quotations may not be directly applicable to railway work, the compilation of his list offers this suggestion to the editors of publications circulating among the rank and file of the employees. Let them publish a dozen or so of such questions each month and answers the next, based on the little-remembered facts of history, civics, biology or chemistry, and even phases of railway work. Such a selection would renew the acquaintance of their readers with this knowledge and would be of much greater value than the general run of puzzle questions. Similar questions could also be propounded in circulars intended for distribution to the general public, and herein, it appears, lies the greatest utility of conundrums such as those propounded by the "Wizard of Menlo Park."

Remodeling Cars Is Marking Time

REPORTS are coming from all over the country of cars being remodeled and reconstructed for one-man operation. A considerable number of these cars before remodeling were considered obsolete or at least obsolescent. Many are open cars, and a large majority are double-truck cars. The reason for this increase in car remodeling is evident. The railways need additional equipment to maintain their service but have little money available for buying new equipment. The cost of such remodeling runs from $800 up to more than $3,000, depending on the extent to which changes are made. In most cases the operating companies are thus enabled to obtain from two to six remodeled cars for the same cost that one new safety car costs.

Generally the reason given for remodeling instead of purchasing new equipment is that of economy, plus necessity. Almost any company will admit that new equipment is more desirable than that built over, but it wants its equipment to keep pace with its growing traffic and claims that this is the only way in which this can be done. But if the question is one of economy, decision as to the policy to pursue can be determined only when all costs are considered, and negligence in this matter may mean that erroneous conclusions are reached.

The cost of old equipment does not end with the shop expenses during rehabilitation. The car body, besides being old and perhaps not well adapted to the new service, is pretty sure to be much heavier than modern equipment. The motor equipment, if old in style, is almost certain to be wasteful of energy, subject to a much higher maintenance expense and slow in acceleration. Finally, with the automatic devices, power-operated doors and step and other equipment for quick acceleration, retardation and passenger interchange, the modern cars make shorter stops and have a higher schedule speed—all of which means a great saving in expensive car-hours. Altogether, therefore, estimates on the economy which will result from the use of rebuilt equipment should include all of these points before definite conclusions can be drawn.

The remodeling which is being done should help to determine the size and capacity of cars that can be handled satisfactorily by one man in various classes of service. Many of the remodeled cars are much larger than the standard Birney car, and their use should demonstrate whether a larger type of car can be used in such service when operated by one man. The question of using a double-truck car instead of the single-truck type now used for one-man operation will also receive considerable attention. Broadly speaking, there is no doubt that the double-truck car has easier riding qualities than the single-truck type, as at present constructed, and is therefore more popular with the traveling public. Whether the economies resulting from the reduced weight of the single-truck car are more than sufficient to offset the advantages of the double-truck car is a question that this remodeling should help to solve. Viewed in its general aspect, the remodeling of cars is really a marking of time by the railways to tide them over this period of depression, yet this work should help to solve many points which are now open for discussion and eventually lead to a type of car which will be an advance in the art.

The Law of Compensation Remains Immutable

"PALPABLY erroneous and at best irrelevant" are the words with which the receivers of the Pittsburgh (Pa.) Railways dismissed the charges made against the company by George N. Munro, special solicitor for the city. Briefly these charges, as described in the last issue of this paper, were that the property was being rebuilt out of earnings at the expense of the car rider, whereas much of the work done was really a charge to capital. From the evidence at hand, railway men will be inclined to agree with the receivers. The facts are that the Pittsburgh Railways was long made the butt in political intrigue, with the result that the creditors eventually had to appeal for protection to the court. The managers of the road did the best they could before the receivers stepped in, but they were forced, in order to keep things going, to live out of capital. Through no fault of their own, except that of not being able earlier to convince the regulating authorities of the need for higher fares, the former managers had been compelled to see the utility of the property as a public service gradually dwindle. They were powerless to do the impossible. The court, however, said that the first duty of the receivers was to the public, and it is under the mandate of that body that the property is being rebuilt into fuller usefulness.

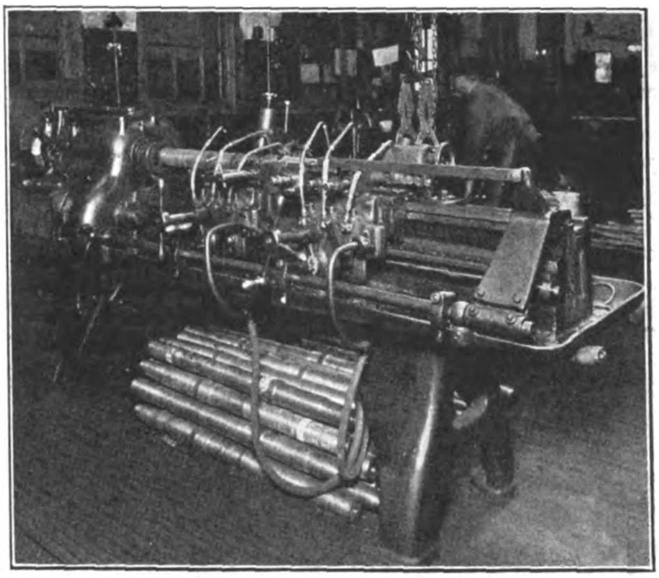
There is much to quarrel with in the report of Mr. Munro, but the principal objection to it is not so much what it says, but in the intimation that the riders of Pittsburgh are being milked by receivers who are interested only in rebuilding the property out of the earnings. This of course is not in accordance with the facts no matter which of the three sets of valuation figures is accepted as a criterion of the value of the road. Residents of Pittsburgh rode for months at less than cost to the company. They must expect now to make good for that orgy. The only other way is abandonment and dismantlement. The law of compensation still remains immutable.

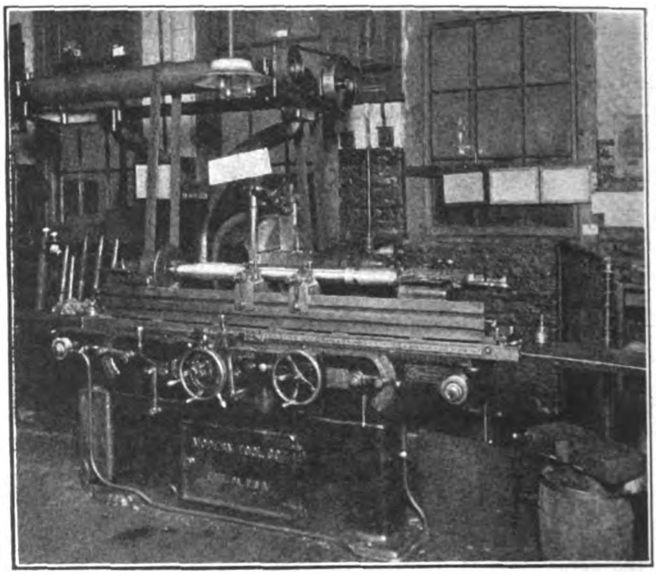
Quotation from the Federal Electric Railways Commission Report

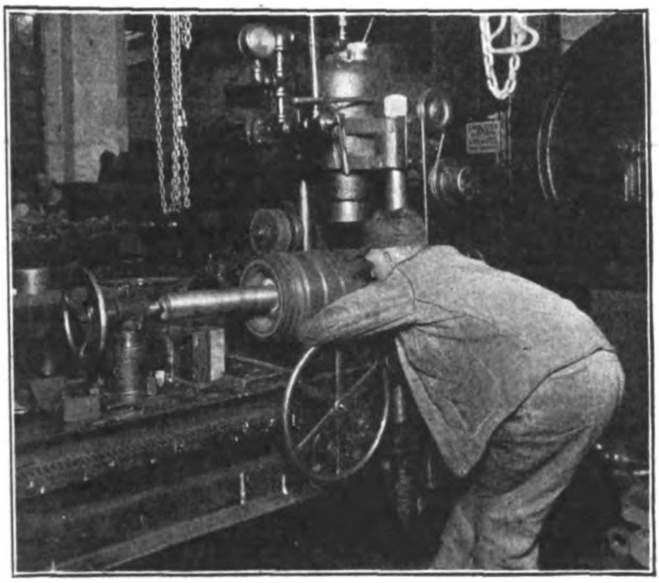
No. 21

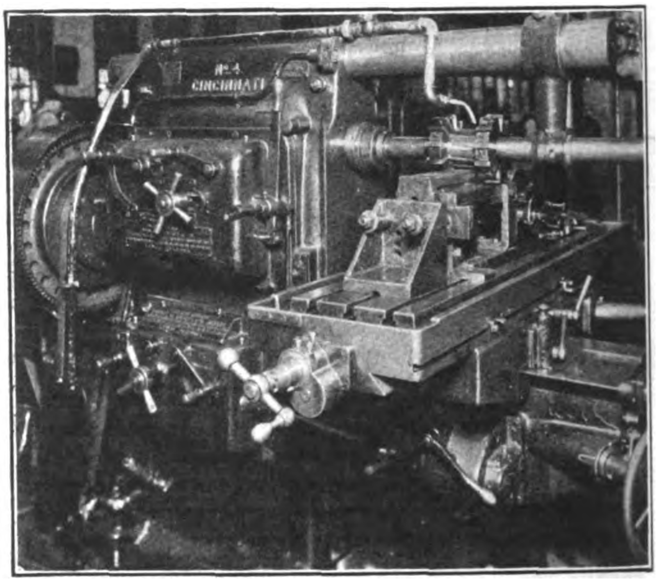
THAT street railway service and jitney service cannot permanently exist and pay their own way in competition with each other under any ordinary urban conditions seems to be well established by experience and by the conditions inherent in local transportation service, but the belief is general that the motor bus may properly be used to supplement the service rendered by the street cars. The motor bus may be used to render a sort of supplementary service, such as the service now rendered on Fifth Avenue and certain other high-grade residential streets in New York City by the Fifth Avenue Coach Company, or the buses may be operated on other independent routes merely as feeders to the street railway system to take care of traffic in partially developed territory in advance of the time when street railway tracks can be laid with reasonable assurance that the investment will be self-sustaining.

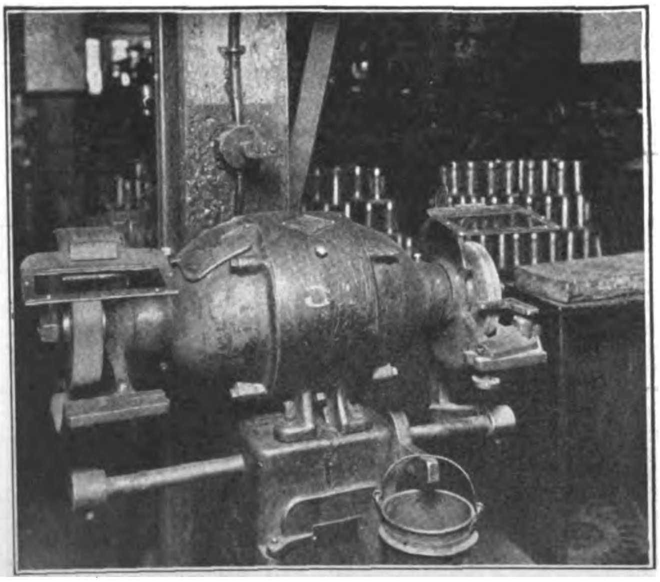
Chicago Surface Lines Tools Which Effect Economies in the Shops

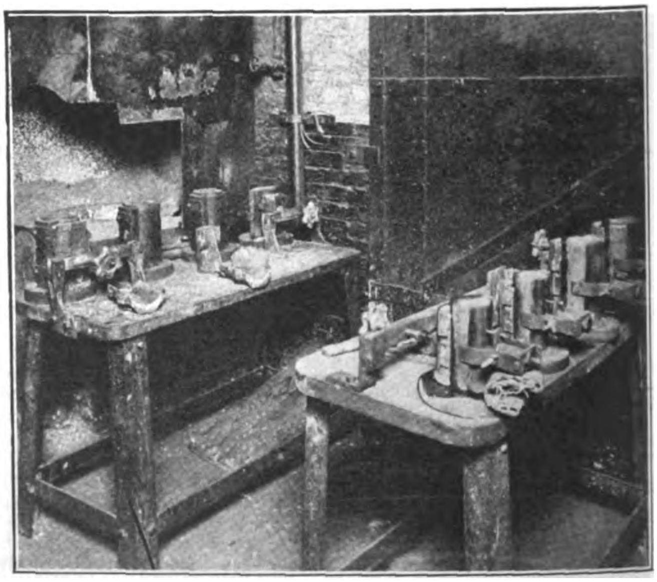












Top, left, six-operation "Lo-swing" lathe which speeds up armature shaft turning for Chicago Surface Lines.

Top, right, grinder used in finishing armature shafts, brass axle bearings and for miscellaneous work.

Middle, left, one-man shaft straightening machine. Friction driving pulley against armature while chalking eccentricity.

Middle, right, forming cutter and milling machine used in remachining built-up truck pedestal gibs.

Bottom, left, emery wheels fitted with glass protectors to make certain the protection of workmen's eyes.

Bottom, right, babbitting jig by which uniform dimensioned bearings are assured and which eliminates waiting for cooling.

A Few Chicago Shop Economies

Reducing the Cost of Machining Armature Shafts—Short Keyway Advantageous—Collett and Mandrel Facilitate Grinding of Brasses—One-Man Armature Shaft Straightener—Handy Babbitting Jig—New Air Tank Support

ALL replacement armature shafts for the Chicago Surface Lines are purchased in the rough blanks and machined and finished in the company's shops. This has been the practice for years, but the tools and machines employed were such that there was a good deal of difficulty in keeping up with the demand. Recently a special layout of machine tools was devised which now enables the shop not only readily to keep ahead of requirements but to turn and finish a shaft for a labor and overhead cost of approximately $4.75, as against an outside comparable cost of $15.

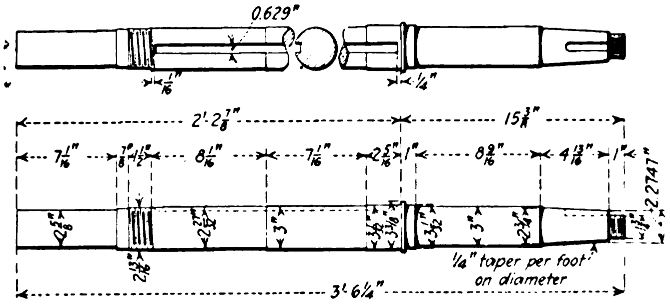
A group of seven machines is conveniently arranged for the progress of a shaft through the seven steps in its manufacture. It is first mounted in a centering machine and the ends drilled and countersunk for the lathe centers. A roughing lathe, adjacent, equipped with a high-speed cutting tool, turns off the rough surface and brings the shaft down in one pass to a size slightly larger than the biggest diameter. The shaft is then placed in a "Lo-Swing" lathe made by the Fitchburg (Mass.) Machine Company, in which the seven or more surfaces are turned. This machine, pictured herewith, is capable of performing six cutting operations simultaneously and each operation is equipped with an automatic feed and stop so that the length and depth of cut are automatically controlled. It is also equipped with a tapering device so that the taper for the pinion seat is made while the shaft is swung in this lathe, and this cut is likewise automatically controlled. The final cut on each surface of the shaft is made with a finishing tool.

The next step is to put the shaft in a grinder, shown herewith, where the various surfaces are brought down to the final diameter and a very smooth finish, an allowance of 0.012 to 0.015 in. being made for this finishing operation.

On the next and fifth step the shaft is swung in a lathe set up especially for threading the shaft. Next, the shaft is placed in a circular mill and the long center keyway for keying the armature core laminations and commutator is cut. For the seventh and last step the shaft is mounted in an end mill in order to cut the keyway for the pinion key. This is cut by first forcing the rotating end and side-cutting tool straight in radially, drilling a hole to the finished depth of the keyway and then side-cutting axially out toward the end of the shaft and coming out of the tapered surface just above the threaded end.

By means of these seven machines it is possible to complete nine shafts per eight-hour day and bring them to an accurate size and high finish. The grinding operation is the limiting step in the speed of production, so that in putting through shafts of a given type in lots of 100 the machinists on the six other steps are used on other work after completing their particular part of the machine work on the lot. By putting the shafts through in quantities of one type the time lost in setting up the machines for the different types is reduced to a very small item.

A new kink has been worked out in connection with the keyway for the pinion, which is designed to preserve the maximum strength of the shaft at the inner end of the taper where the maximum strain takes place. The keyway is machined only from a mid-point of the tapered surface to the end, leaving the full section of the shaft at the inner side of the pinion. It was felt that with a perfectly tapered and finished shaft and pinion, and with pinion properly pressed on, no key whatever is really needed. However, H. H. Adams, superintendent of shops and equipment, and T. A. Shaughnessy, master mechanic of the West Side shops, were not satisfied to depend altogether on friction, though they did conclude that a half-length key would give adequate insurance against loose pinions. A drawing of a shaft showing the dimensioning of the half-length keyway is reproduced herewith.



ARMATURE SHAFT FOR G. E. 226 MOTOR, SHOWING HALF-LENGTH KEYWAY FOR PINION

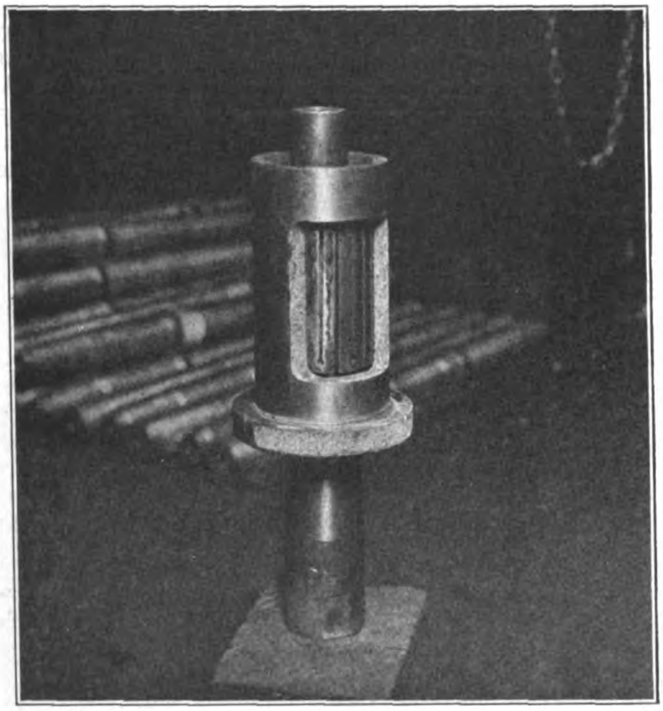
OPEN CIRCUITS TRACED TO CORE SLIPPAGE

Considerable trouble with open circuits due to breakage of the commutator leads on a type of motor having a very short core has been experienced in Chicago. The cause of this trouble was sought for a long time and various remedies were applied. The trouble continued, however, until occasion arose to renew several armature shafts. Then it was found that a very slight slippage of the armature core laminations on the shaft, amounting to something less than 1/16 in. at the periphery of the core, was taking place. Investigation developed this fault to be frequent, the existence of slippage being indicated or determined by sounding, by worn keys, by testing with a bar, rusty shafts, front core castings loose, etc. As any movement of the armature core on the shaft would be transmitted directly to the commutator leads and likely result in crystallization of the copper, this condition was hit upon as one cause of the unduly large number of opens. Hence, as these motors have been in service for a number of years, they are all being dismantled and rebuilt in a fundamental way as rapidly as they come in, so that there should result a material lowering of the maintenance cost in the future. In doing this work the old shaft is pressed out and the laminations bolted together, rebored for a shaft 1/8 in. larger in diameter and a new keyway cut in them.

Since this remedy has been applied the trouble has apparently been eliminated. The experience is pointed out here simply to suggest that this is a possible source of open circuit trouble, which, though uncommon, may explain a similar trouble on which other equipment men may have been seeking light.

GRINDING BRASS BEARINGS FACILITATED

The grinder above referred to is used between armature shaft jobs for grinding the exterior surface of the brass axle bearings. These are turned down to within 0.012 in. of size with a finishing tool and then ground to size. The set-up of the bearings for grinding has been made a very simple and quick operation by the use of an expanding collet. This is put inside the bearing and both are dropped over a mandrel, the large end of which is tapped solidly against a block of wood, locking the bearing firmly on the mandrel, which is then quickly placed between the grinder centers. The collet and bearing are easily removed by similarly champing the small end of the mandrel against the wood block. The collet and bearing assembled on the mandrel are shown in an accompanying picture. The collet may be seen through the hole in the bearing. The inside of these bearings is smoothed only with a finishing tool and a film of babbitt is run in to start the bearing off.

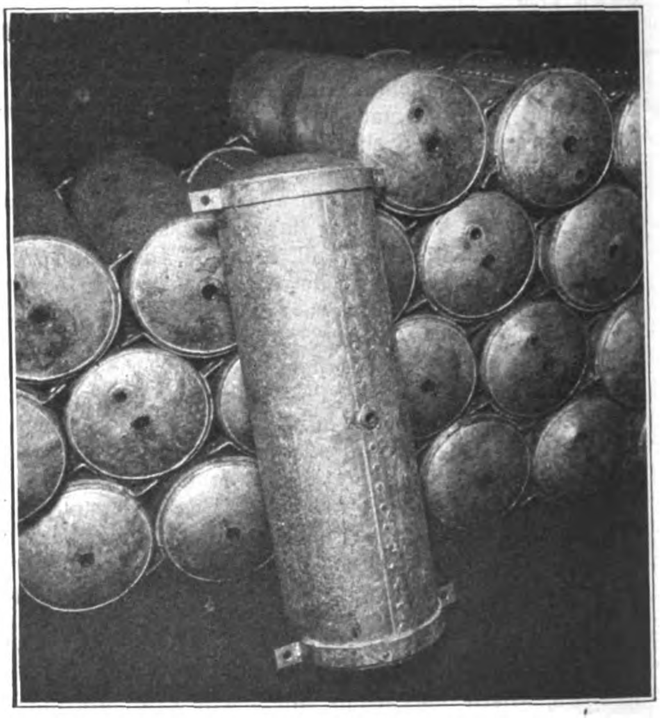


MANDREL COLLET AND BRASS BEARING ASSEMBLY USED FOR QUICK SET-UP OF BRASSES IN GRINDING MACHINE

It usually requires two men to do a satisfactory job of straightening an out-of-true armature shaft, for with the ordinary rig one man can hardly rotate the armature with one hand and at the same time gage and mark the high spots with the other. In the West Side Chicago shops, however, the straightener has been supplemented by a simple means of rotating the armature so that one man can easily do all of the work alone.

The flywheel shaft of the pump, which runs continuously and supplies the power to the hydraulic press forming a part of the straightener, was lengthened and a 6-in. pulley attached. This was belted to another pulley mounted on one end of a short countershaft at the end of a pivoted bracket. On the opposite end of this shaft is a leather-faced wood wheel, which, as the bracket is lowered, bears against the periphery of the armature, causing it to rotate. The position of this bracket is controlled by a foot pedal brought down underneath and in front of the machine.

The operator swings an armature requiring attention into the machine and then, resting his hand against the bed of machine, steps on the foot pedal, bringing the leather faced wheel down against the armature. As the latter rotates the eccentricity is gaged and chalked. When this is done pressure on the pedal is released and the bracket automatically pivots up out of the way. The armature is then properly set and pressure applied to spring the shaft.



A HALF BAND BRAZED ON THE AIR RESERVOIRS PROVIDES AN IMPROVED METHOD OF HANGING THEM

The Chicago surface companies have in use 2,000 Pullman trucks which are provided with no wearing plates on the pedestal gibs or jaws. When these surfaces become worn, therefore, they are reclaimed by welding, building up the worn surfaces and then machining back to size. This machining is expeditiously done by using a forming cutter which mills the three bearing surfaces, front face and two edges, to the final size and finish in one pass. An accompanying picture shows clearly the type of machine and cutter used and the L-shaped pedestal jaw as mounted in the milling machine.

GOGGLES THAT ARE ALWAYS USED

In a picture reproduced herewith it is seen how the need for goggles for workmen while using the emery wheels is dispensed with. It is difficult to secure proper use of goggles; the workmen do not always have them handy, and if they have them they often forget to use them. So 100 per cent safety in this respect is secured in the Chicago shops by attaching a rectangle of glass in a metal frame to the framework of the emery wheel in such a position that the workman automatically looks at his work from behind this glass shield. All the emery wheels are equipped in this manner.

A HANDY BABBITTING JIG

Some difficulty is experienced in obtaining babbitted bearings of uniform thickness on account of the variation in the shape of the shells. This has been overcome in Chicago through use of the scheme pictured on page 926. On two metal tables adjacent to the melting furnace are mounted four pairs of bearing cores for four sizes of bearings. At the sides of each of these iron cores are blocks against which the bearing shells rest as they are placed in position for pouring in the babbitt. These blocks are held in position by strap springs so that the shell may be brought closer to the core than the position obtaining as it comes in contact with the blocks, by forcing them against the spring supports.

The thickness of the bearing is thus kept uniform by measuring from the core to the outer edge of the shell and forcing the latter to the position giving the correct dimension. The shell is brought to and held in this position by a hand screw which bears against the back of the shell and is supported in a yoke at the front of the table. This yoke is hinged to the center of three iron posts and rests in a slot in either of the two others. After the babbitt in one shell has been poured it is permitted to cool while the workman is getting a shell in place on the other core of the pair. The yoke is then loosened and swung over to the other outside post and tightened against the shell on this core to bring it to the right position. The babbitt is then poured. While this is cooling the other bearing is removed from the mandrel and a new shell put in place, and by that time it is possible to loosen the yoke and swing it over, repeating the cycle. This makes the work a practically continuous performance without lost time and insures a uniform bearing thickness at a minimum cost.

EFFECTIVE AIR RESERVOIR SUPPORT

A new way of hanging the air reservoirs was recently devised in connection with the fifty new trailers now under construction in the West Side shops. At each end of the tank, where the lap of end and side sheets makes double thickness of metal, a band is brazed to the tank, the band extending half way around, with the ends bent out horizontally. After the bands are brazed on, the tank is hot galvanized inside and out. It is supported under the car floor by two U-shaped pieces, which are bolted to the wood cradle above and to the tank bands below, with the U's opening sideways toward the tank. These support connections are turned this way rather than with backs toward the tank to avoid a narrow place between them and the tank in which dirt and water could accumulate.

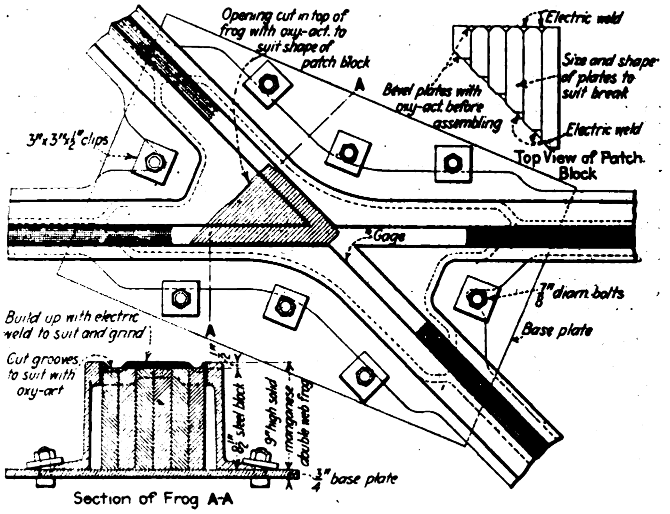
With the old system of hanging tanks by means of bands fastened to the cradle and extending around the tank, but not fastened to it, there is a strong tendency for failure to occur under the bands because of the slight movement between tank and bands and the possibility of water and dirt getting underneath the bands to help corrosion and erosion. With the bands brazed on tight all of this is eliminated and the life of the tank undoubtedly extended.

Broken Manganese Frogs Repaired Without Interrupting Traffic

Solid Plugs Which Were Supported on Steel Plates Inserted Between the Frog and the Ties Were Used to Build Up the Break

TWO manganese girder rail frogs of the box or double web type, at the intersection of Sutter and Market Streets, in San Francisco, recently broke without warning, leaving the crossing in an unsafe condition and likely to do considerable damage to rolling stock or further damage to the crossing itself. Despite the heavy traffic at this part of the system equipment and materials were assembled as soon as the break was discovered and the rebuilding of the two frogs was completed the same day without taking the crossing out of service.

In double web frogs of this type, when a section of the top breaks out, the open space beneath makes it impossible to build up the break in the usual manner because of the absence of any foundation on which to build. It was therefore decided to replace the broken sections with solid plugs, supporting them on steel plates which could be inserted between the frog and the ties for this purpose. These base plates were made of ¾-in. metal about 2 ft. x 3 ft. in size and bolted clips were used to clamp frog and plate rigidly together. Eight of these clips were placed around the flange of each frog, as shown in the accompanying illustration.


Opening cut in top of frog with oxy-act. to suit shape of patch block
A
Electric weld
Size and shape of plates to suit break
Bevel plates with oxy-act. before assembling
Electric weld
Top View of Patch Block
3"x3"x½" clips
Gage
⅞" diam. bolts
Base plate
Build up with electric weld to suit and grind
Cut grooves to suit with oxy-act
A
½"
8½" steel block
9" high solid manganese double web frog
¾" base plate
Section of Frog A-A

METHOD OF REPAIRING BROKEN WEARING SURFACE OF SOLID MANGANESE FROG

A triangular shape was selected as the easiest form of plug to build up and a right-angled triangle was measured off on each of the frogs, the size and location being chosen so that when the plug was in place it would give the maximum strength to the broken sections. The dimensions of the larger plug are shown on the accompanying illustration. The plugs were built up of steel plates, the desired shape and exact size being secured by beveling the edges with an oxyacetylene torch and by welding adjoining plates together along the joints. When the plugs had been delivered to the job, the exact dimensions of the openings required in the frogs were marked out and after the base plates were set the holes were cut out with the oxyacetylene torch. With the plugs in place an electric weld was made entirely around the joints between plug and frog, and finally the entire job was smoothed up with the rail grinder. The plug rested on the base plate without being attached to it in any way.

After the two plugs installed in this way had been in service for a few days, it was almost impossible to tell which of the several frogs at this particular crossing had been repaired.

The work was carried on under the general direction of B. P. Legare, chief engineer maintenance of way and construction, United Railroads.

Hedley Addresses Cornell Engineers

Interborough President Draws on His Personal Experience in Order to Illustrate His Advice to Young Men Who Are Ambitious to Succeed

THE speaker at a meeting of the Cornell Society of Engineers, held in New York City on April 21, was Frank Hedley, president and general manager of the Interborough Rapid Transit Company. Some of his remarks were referred to editorially in the issue of this paper for April 30. This association is made up of former Cornell students in all branches of engineering and Mr. Hedley gave them the benefit of his practical experience, beginning in England, where as a boy he learned the fundamentals of steam railroad shop work.

After some general introductory historical remarks regarding electric railway development before he became interested in it, he told of his first practical work in the Erie Railroad shops, in Jersey City, soon after his arrival in this country. He said that after two years with the Erie he secured work in the New York Central shops in Forty-third Street, New York City, where at that time was an old roundhouse just north of the Grand Central Station. Here he had a very interesting experience while working in a shop gang as machinist. He said that each gang foreman had three engines to look after, and on one occasion his gang had two of its three engines ready, but was waiting to have the valves set. The gang foreman was ill and the master mechanic was about to lay off the rest of the men until his recovery because he supposed that there was no one who knew how to set the valves. Young Hedley, however, had been keeping his eyes open and he volunteered to set the valves. He was permitted to do this and did the job successfully, but when a short time afterward he asked for the same pay as the foreman got his request was turned down with the statement that it was impossible to pay him more than the maximum rate of 24 cents per hour.

Discouraged by this limitation on his earning capacity young Hedley left the New York Central and secured a job as machinist in the Ninety-eighth Street shops of the Third Avenue Elevated Railroad. Here his knowledge of valve setting caused a repetition of the New York Central experience, but this time, after a stormy encounter with the gang foreman, he came out ahead and was himself made foreman. It was only a short time until he became master mechanic of the West Side Elevated Railroad, and in 1889 he became master mechanic of the Kings County Elevated Railroad in Brooklyn. Here he had charge of engines and cars; he inaugurated railroad service and remained with the company until 1893, when he went to Chicago with the contractors who were building the Lake Street Elevated Railroad.

In Chicago Mr. Hedley was general superintendent of construction on the Union loop and the Northwestern Elevated Railroad and he gained a great deal of operating experience as well, because Charles T. Yerkes, president of the road, left much of the administration to him.

Mr. Hedley said he came back to New York in 1903, first with the construction company, later organizing the operating forces of the Interborough Rapid Transit Company. Still later he was put in charge of the street railways as well.

Referring to some of the things that have occurred in the rapid transit development in New York City, Mr. Hedley spoke of the original large motors which were employed on account of their great accelerating ability, although the operation was far from ideal. He could see that while in the early stages of operation by electricity this operation was not as satisfactory as that with the old steam locomotives, yet the goal of ultimate success was always in sight. A great deal of money had to be spent in rebuilding and redesigning, and the operating department worked very close to the manufacturers' designers, because the latter had to get many pointers from the former. Development went along very rapidly, so that today the operators feel absolute confidence in the electrical equipment.

This, of course, said Mr. Hedley, involves a high standard of inspection and maintenance. The Interborough today does its inspection on a mileage basis, in connection with periodical lubrication. Motor cars make 1,200 miles before they are laid up. They are then taken in for oiling and adjustment, carbon brushes are fixed up, brakes tightened, etc. There are no terminal inspections.

Mr. Hedley explained that as a result of careful inspection rapid-transit trains frequently operate for thirty days at a stretch without developing a single interference with train movement on account of defective inspection or defective equipment. He described a number of the wonders of the subway equipment, and called attention to the fact that the motor cars of one of the ten-car subway trains have more apparatus in them than any steam locomotive ever constructed. Moreover, they have a horsepower capacity that can produce tractive effort sufficient to accelerate the trains at the rate of 1.7 m.p.h. per second. This is about three times as rapid as is possible with the best steam locomotive attached to the best passenger train in the country. In spite of the perfection of this equipment, Mr. Hedley thinks that there is still a wide field for electrical development and that the surface has as yet only been scratched. We are, he said, just in the beginning of electrical engineering, and there is a tremendous field for the young engineer who is resourceful.

Interspersed with the technical part of Mr. Hedley's discourse were a number of observations regarding life and living. For example he said that the best way in which to make a living is to be able to produce, and to be able to convince the other fellow you know how to produce; that is, how to run the business that he needs to have run. Then you can make him pay you well for running it. Again, it is not absolutely necessary for a man to have a technical college education. But this one thing is necessary, if he doesn't get his technical education in college, he must get it after he starts to work. And it is very difficult to get a technical education, night after night, after putting in hard work in the shop. The principal thing is that any one who starts out, no matter what his education, must, in order to be successful, show that he can do things a little better than some one else. Such a man cannot be held back.

Testing Insulating Materials—I[*]

There Are Certain Fundamental Characteristics Which All Insulating Materials Must Have to Meet the Operating Conditions—The Presence of These Characteristics Is Determined by Certain Tests as Described

BY JOHN S. DEAN
Railway Motor Engineering Department, Westinghouse Electric & Manufacturing Company

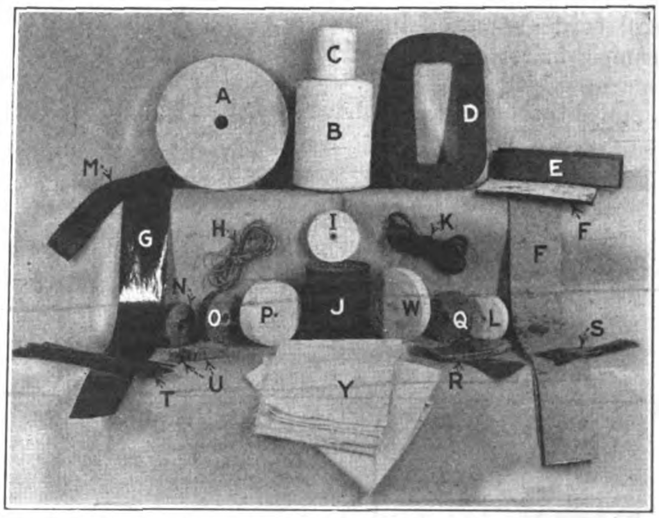
IN THE electrical industry the term "to insulate" means to separate conducting ~~bodies~~ by means of non-conductors so as to prevent a transfer of electricity. As applied to railway motors the function of insulating material is to act as a separator between adjacent commutator bars and turns of the copper conductors and to isolate from the ground these conductors, motor leads and wiring connections around the frame.

The variety of insulating materials used in the construction of a railway motor ~~is~~ shown in ~~detail in a~~ chart published in the April 19, 1919, issue of the ELECTRIC RAILWAY JOURNAL, page 778. These materials primarily take the form of ~~either a liquid, paper~~, cloth, cord or a solid and are segregated and classified in Table I.

TABLE I—CLASSIFICATION OF INSULATING MATERIALS

Liquids		Amber insulator Plastic insulator Asphaltum varnish Insulating varnish Shellac
Papers	Untreated	Fish paper Asbestos Fullerboard Cement paper
	Treated	Micarta Japanese paper and mica—mica tape Fish paper and mica
Cloths	Untreated	Cotton tape Cotton sleeving Surgical braid Gray webbing Drilling
	Treated	Treated cloth Friction tape Friction cloth Treated duck
Cords		Torpedo twine Jute rope Linen twine
Solids		Mica Porcelain Rubber bushings Impregnating gum Cement

The insulation of railway motors not only involves the separation of the various conductors and their isolation from ground but includes a number of other factors, such as the characteristics of the materials used and the methods of applying them to the various detail parts of the motor during the process of manufacture. Further, in the selection of this material it is essential to take into consideration the conditions under which railway motors have to operate, the most important of which are: (1) Comparatively high temperatures; (2) variable trolley voltages and line surges; (3) exposure to considerable moisture, dust and dirt; (4) subjection to severe mechanical strains and vibrations; (5) frequent abuse by rough handling; (6) poor maintenance, in many cases; (7) ruggedness of construction and accessibility and convenience for repair.



INSULATING MATERIALS FOR RAILWAY MOTORS

A—Asbestos paper
B—Cotton sleeving
C—Linen twine
D—Asbestos and mica
E—Fish paper cell
F—Fish paper and mica
G—Cement paper
H—Torpedo twine
I—Asbestos tape
J—Friction cloth
K—Jute rope
L—Cotton tape
M—Treated duck
N—Mica tape
O—Treated linen tape
P—Gray webbing tape
Q—Friction tape
R—Treated cloth
S—Shellacked fullerboard
T—Fullerboard strips
U—Fish paper U-pieces
W—Surgical tape
Y—Drilling hoods

From the standpoint of dielectric strength, glass stands highest among the non-conductors of electricity, but its use for insulating purposes is limited on account of its brittleness. It is not used in any form on railway motors, but has been applied quite extensively and has proved invaluable in certain fields of electrical work.

To meet the above conditions satisfactorily the insulating materials for railway motors must have attention with respect to: (1) Dielectric strength, (2) mechanical strength, (3) flexibility, (4) moisture, acid and oil proofness, (5) heat resistance, (6) heat conduction and radiation, (7) cementing and sticking qualities and (8) suitable finish.

The above properties cannot be had combined in any one insulating material, hence a great variety of individual untreated materials and combinations of treated and composite materials are required. These must be selected for different details of the motor, depending upon the mechanical and electrical strains to which the various parts are subjected and the method of applying during the process of manufacture. Under these conditions a great variety of tests of the untreated materials, the materials used during the process of treatment and of the treated and built-up materials are necessary to insure the proper insulation of the completed machine.

Some of the most important tests which experience has shown are required in connection with this variety of insulating materials are given in Table II to show the refinement necessary in producing a railway motor correctly insulated that will finally pass the specified factory tests and at the same time stand up under the severe operating condition to which it is subjected in service.

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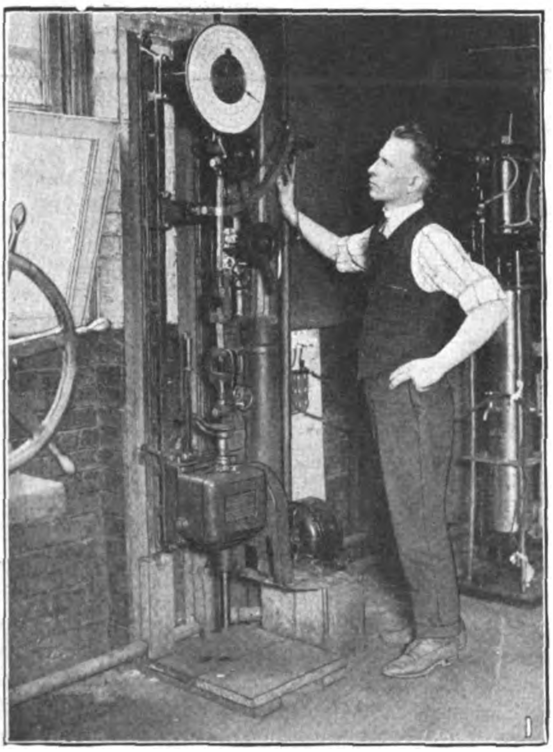
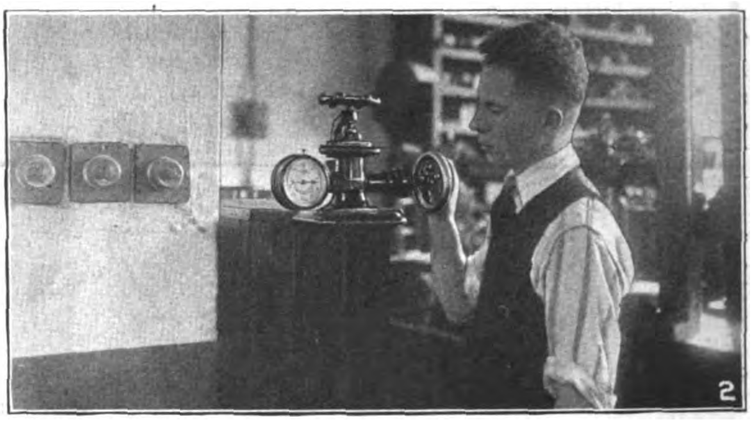
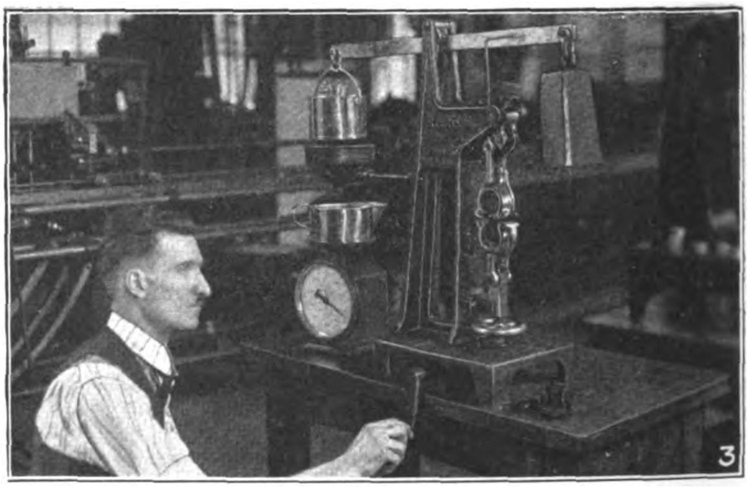
[*] This is the first of two articles by Mr. Dean on the testing of insulating materials. In the April 16 issue of this paper Norman Litchfield described the essential characteristics that should be specified for insulating materials. This and the following article describe methods and apparatus used for determining these characteristics.

To test the mechanical strength of cotton tape, cotton sleeving, surgical tape, gray webbing, drilling, treated cloth, friction tape, friction cloth, treated duck, torpedo twine, jute rope and linen twine, an automatic power cloth tester, having a capacity ranging from 50 to 300 lb., is used. Test specimens of cloth are cut 1 in. wide and about 6 in. long and samples of tape and cord are cut 6 in. in length. The test strip of sample material is clamped in the jaws of the testing machine, which are 2 in. apart, and power is applied through a motor-driven worm. The pull or breaking point in pounds is registered on an indicating scale attached to the upper clamping jaw of the machine. Tests are made on a number of samples and an average value is taken as the final result.







No. 1—Apparatus used in making tensile tests on tapes, cloths and cords. No. 2—Apparatus used in making rupture tests on papers. No. 3—This apparatus is used in testing the strength of cements.

MAKING TENSILE STRENGTH AND RUPTURE TESTS OF CLOTHS, PAPERS AND CEMENTS

A test made on five samples of cambric such as is used in making treated cloth shows the following:

Test No	1	2	3	4	5	
Warp	50	52	40	41	42	= 45 lb., average
Woof	22	27	24	31	29	= 27 lb., average

The warp represents the thread running lengthwise in a woven material, while the woof is the name given to the threads carried by the shuttle; *i.e.*, those running crosswise of the fabric.

To determine the comparative strength of the various papers used for winding cells, U-pieces and for foundations for built-up mica wrappers, etc., a Mullen testing machine having a capacity of 100 lb. pressure is used. The test specimens are cut 3 in. square from the commercial rolls of paper. The test piece of paper is clamped in the machine over a plunger which is forced up against it by means of a hand-operated pump. When the paper is ruptured the gage pressure is read and recorded. Fish paper such as is ordinarily used in built-up mica wrappers shows a rupture test of about 40 lb.

During the process of manufacturing micarta insulating material it is necessary to select a paper that will take up a certain definite amount of shellac during treating. To determine the degree of porosity, a glass burette graduated from 0. to 100 cu.cm., over a length of 22 in. of the tube, is used, together with two steel clamping disks with a 1-in. hole in the center and a 125-cu.cm. glass flask. The flask is connected to the lower end of the burette by means of a flexible rubber

TABLE II—TESTS ON ELECTRIC RAILWAY MOTOR-INSULATING MATERIALS

Untreated materials	Tensile test Rupture test Air porosity test Pulling test Destruction test Creepage test
Materials used in treating	Drop point test Viscosity test Dielectric test—liquid insulating materials Penetration test Aging test Oilproof test Acid, alkali and salt water test Cementing and sticking qualities test Heat conduction and radiation test Baking or drying qualities Weather test
Treated and composite materials	Adhesion test Slip test Treating test specimens Dielectric test—sheet insulating materials Moisture absorption test Gaging built-up mica board Dielectric test—built-up mica and paper Experimental treating power

tube. To the top of the burette is connected the lower clamping disk and this connection is fitted with a pinch cock. Test specimens are cut 2¼ in. wide lengthwise from the sheets of paper to be tested.

In the test the pinch cock is opened and the flask is placed on the upper ring support opposite the zero on the burette and filled with water until the flask and burette are filled up to the zero graduation on the burette. The test strip of paper is then clamped between the two steel disks and the pinch cock is closed. The flask is then lowered to a position which brings the water level of the flask 24 in. below the zero mark on the burette and the pinch cock is opened for ten seconds to allow the air to flow into the burette through the sample of paper. The pinch cock is then closed and the flask is raised until its water level coincides with that of the burette and this level is read on the burette. This gives the number of cubic centimeters of air drawn into the burette. This figure is taken as the porosity number. Each strip is tested at intervals of 5 in.

A good grade of Kraft paper such as used in connection with the manufacture of micarta for railway motor parts has a porosity figure of from 40 to 50.

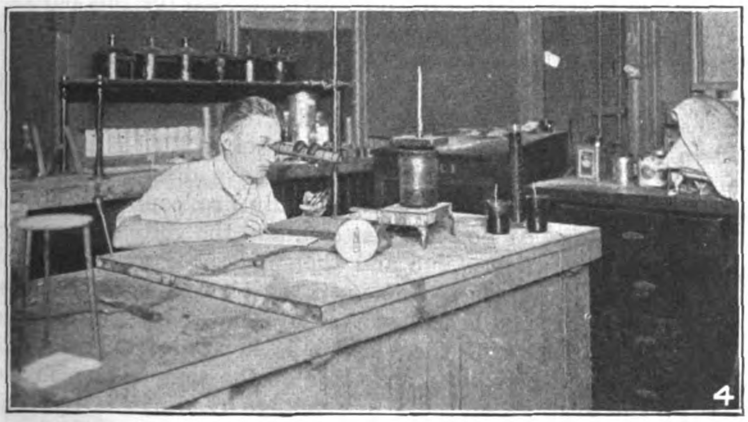
Cements for railway motor construction are used primarily in back of the commutator neck to seal up the openings around the windings and are put in place in a plastic condition and allowed to harden. The apparatus used for testing these is a Riehle cement testing machine.

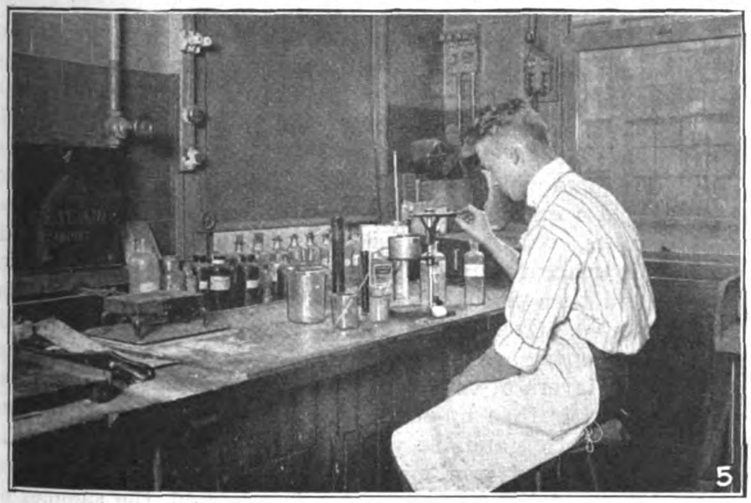
Test specimens are made up in a special shape, so as to fit into the jaws of the testing machine. They are molded from the cement and have a cross-section of ½ x 1 in., an equivalent of one-half square inch, at the point of fracture.

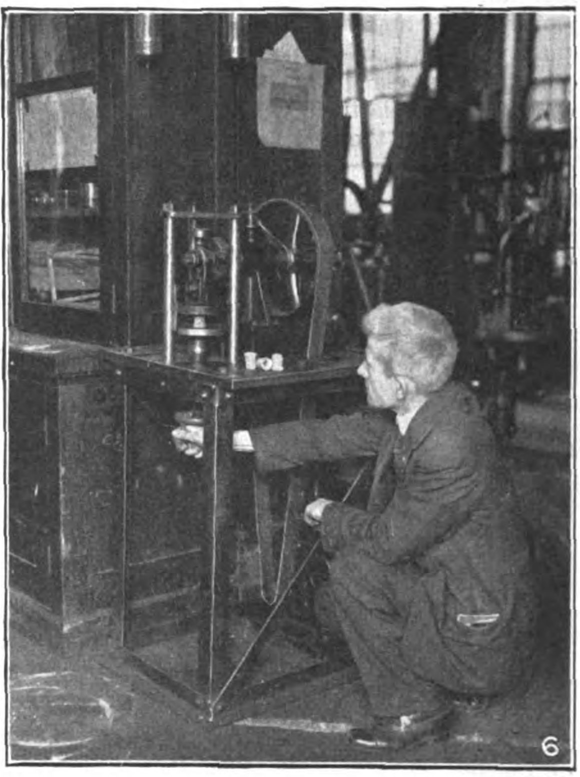
The test is made by placing the sample in the jaws of the testing machine and applying the power through a system of levers, which are balanced for the grade of material under test. The pulling force applied to the upper jaw is automatically adjusted by a transfer of small shot from one receptacle to another. As the shot fall into the retainer on the spring balance they are weighed, registering the pull. When the sample breaks, the transfer of shot is automatically shut off and the maximum recorded pull is read from the dial on the scale. In determining the durability of rubber bushings used to protect the motor lead cables where they come out through the frame of the motor, a special intermittent compression testing machine is used. The test rubber bushing is placed in an upright position between the two horizontal parallel plates of the testing machine and the height of the lower plate is adjusted to get a predetermined compression of the bushing when the plates are nearest together. The motor is started and this raises and lowers the upper plate intermittently, compressing the sample about sixty times a minute.

A recording speed indicator is attached to the driving shaft of the machine, which registers the total number of compressions. The sample specimen is tested until it shows signs of destruction. This test gives comparative results as to the suitability of the various grades of rubber bushings.

Porcelain insulators used on railway motor brush holders are tested to determine the ability of the insulator to resist any electrostatic discharges over the surface of the porcelain. The equipment used is similar to the apparatus (which is explained in detail later on)





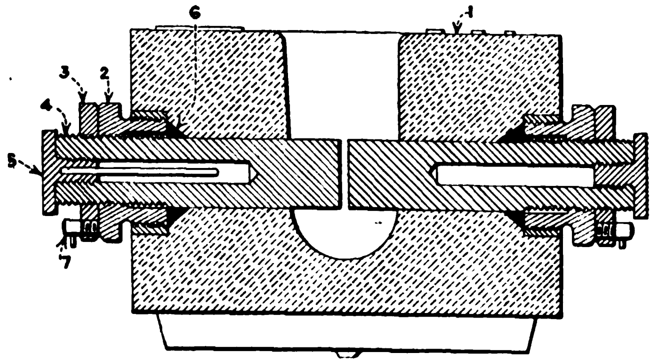


No. 4—Insulating gums are tested to determine the softening at different temperatures. No. 5—Viscosity of insulating varnishes is determined by a viscosimeter. No. 6—Rubber bushings are tested to destruction.

TESTING INSULATING GUMS, VARNISHES AND RUBBER BUSHINGS IN THE LABORATORY used to make the dielectric test on sheet insulating material.

The porcelain insulator is placed on a metal rod and a small bare copper wire is twisted around the middle of its outer surface. One side of the testing circuit is connected to the metal supporting rod and the other side is connected to the copper wire on the porcelain. The test voltage is raised until a flash-over occurs across the surface of the porcelain, blowing the breaker. The maximum voltage is read and recorded at the flashing point.

To determine the softening, at different temperatures, of insulating gums such as are used in impregnating railway motor field coils it is important to use a grade of gum that will not soften and run out of the windings under the most severe operating conditions of the motor. The apparatus used in testing gum for this quality consists of two glass beakers, one within the other, and a glass tube to receive a thermometer to which a small platform of aluminum is attached on the outside to hold the test sample of gum. A small telescope is used in noting the various readings. The test specimen is molded in a metal mold and has the following dimensions: Total length 2 in.; width ½ in. for 1 in. of the length, while the other inch tapers from ½ in. down to ⅛ in. at the end. The thickness of the test piece is ⅛ in. The ⅛-in. square tip of the wedge is painted white to increase its visibility. In the test the wedge is placed with the 1-in. tapered end overhanging on the platform attached to the glass tube which is placed in the inner beaker. Glycerine is poured in the outer beaker and heated by an electric stove so regulated as to raise the temperature in the inner beaker at the rate of 2 deg. C. per minute. Observations are made and recorded of the "sag point," which is the temperature at which the test piece begins to bend; the "bottom point," which is the temperature at which the test piece touches the bottom of the inner beaker 2½ in. below the platform, and the "drop point," which is the temperature at which the overhanging test column breaks.



TEST CUP USED IN DIELECTRIC TEST OF LIQUID INSULATING MATERIALS

To determine the viscosity or the internal friction of the various grades of insulating varnishes a Stormer viscosimeter is used. In this the outer beaker is filled with water, which is changed from time to time to maintain the test varnish in the inner beaker at a uniform temperature of 21 deg. C. The test varnish, which is taken at the specific gravity used in the factory, is placed in the inner beaker. A small metal cylinder, which is immersed in the test varnish, is rotated due to the action of the force of gravity on a 100-gram weight connected to it through a system of pulleys and gears. The pointer on the scale of the apparatus is set to zero and the time required to make 100 revolutions of the cylinder is taken as the viscosity figure. This apparatus is sometimes used to record the number of revolutions the cylinder makes in one minute.

The results of a test on insulating varnish such as is used in railway motors show a viscosity figure of 25, which interpreted means 100 revolutions of the drum are made in twenty-five seconds using a 100-gram weight.

To determine the dielectric strength of oils and varnishes the same testing circuit as used in making the dielectric test on sheet insulation material is used. The testing board with the brass terminals is replaced by a standard oil testing cup developed for this purpose.

The test cup, which is shown in detail in one of the illustrations, is adjusted by spacing the electrodes ⅒ in. apart. The cup, after being carefuly cleaned with benzine or gasoline, is filled with the test varnish to within ½ in. of the top. After being filled it is allowed to stand until all air bubbles have disappeared. The terminals of the testing circuit are connected to the binding posts on the test cup, and the voltage is applied first at a low value and then increased at the rate of 3,000 volts per second until the oil in the cup is punctured and a breakdown occurs. During the test the temperature of the varnish is kept at from 20 to 25 deg. C. Five tests are made on the sample varnish and the average of these five voltage readings is recorded as the dielectric strength of the varnish.

To determine the ability of the various grades of varnish to penetrate the fibrous structure of the various grades of cloth used for insulating purposes two glass tubes, ½ in. inside diameter and 12 in. long, open at both ends, are used. These are held in an upright position in a frame which is fitted with a clamping arrangement to hold a number of layers of cloth against one end of the tubes, which are filled with the varnish to be tested. To make the test the test tubes are closed with corks and then filled with the two grades of varnish to be tested. Over each of the upper ends of the tube, which are open, are securely clamped to the same thickness 100 layers of cotton cloth cut 2½ in. square. The apparatus is then up-ended, the corks are removed to give ventilation and the varnish is allowed to soak into the cloth for fifteen minutes. The corks are then placed in the tubes, the apparatus is reversed, the samples of cloth are removed and the number of layers penetrated are counted, which is a measure of the penetrating qualities of the two varnishes. In making this test it is important that both samples should have the same dilution and temperature, as these characteristics affect the penetration figure. This test is only comparative, but it is a good index as to the most suitable varnish to meet these requirements.

Finds Good Painting Pays

THE Chattanooga Railway & Light Company has decided that the old way of painting and varnishing cars thoroughly is after all the best. After trying various kinds of less expensive paints and after experiments with the use of enamel, the management has come to the conclusion that the best final results are obtained by removing everything, starting at the bottom, and putting on seven coats of body paint and two coats of best varnish on top of this. This is naturally more expensive as far as first cost goes, but in the long run there is greater satisfaction and less annual cost over a period of years than by some substitute methods.

Equalized Brakes and Braking Power*

Methods of Obtaining Equalized Brakes on Cars Equipped with Various Types of Brake Rigging Are Described and Examples Solved for Braking Power, Percentage of Braking Power and Total Leverage

BY H. M. P. MURPHY

As ALL practical designs of foundation brake riggings must be properly "equalized" the following definition of an equalized brake will assist in making this term clear: An equalized locomotive or car brake is one which is designed so that, during a brake application, equal forces will be delivered to all brake shoes which are applied to wheels carrying equal weights and performing similar duties, regardless of shoe wear, variable piston travel, etc.

As an illustration of the preceding definitions, consider the air brake portion of the standard car brake rigging shown in Fig. 1. It will be observed that this brake is fully equalized because the forces delivered to each of the four brake beams are always equal to each other, and each pair of wheels not only carries the same weight but also performs the same duty and should, therefore, be braked with just the same force as each of the other pairs of wheels on the car. As another illustration, consider the brake rigging shown in Fig. 2. In this case there are two distinct classes of wheels, *i.e.,* drivers and trailers, which not only perform different duties but also carry different weights. Consequently, although the forces delivered to all of the shoes concerned are not equal, the brake rigging must not be assumed to be of the non-equalized type. In fact, as the forces delivered to each of the four driver brake shoes are equal to each other, and as the forces delivered to the trailer shoes are always equal to each other, the brake rigging is properly equalized, according to the definition. The reasons for employing different degrees of shoe pressure on wheels which do not carry equal weights or which do not perform similar duties will be fully discussed later under the head of "Braking Power," etc.

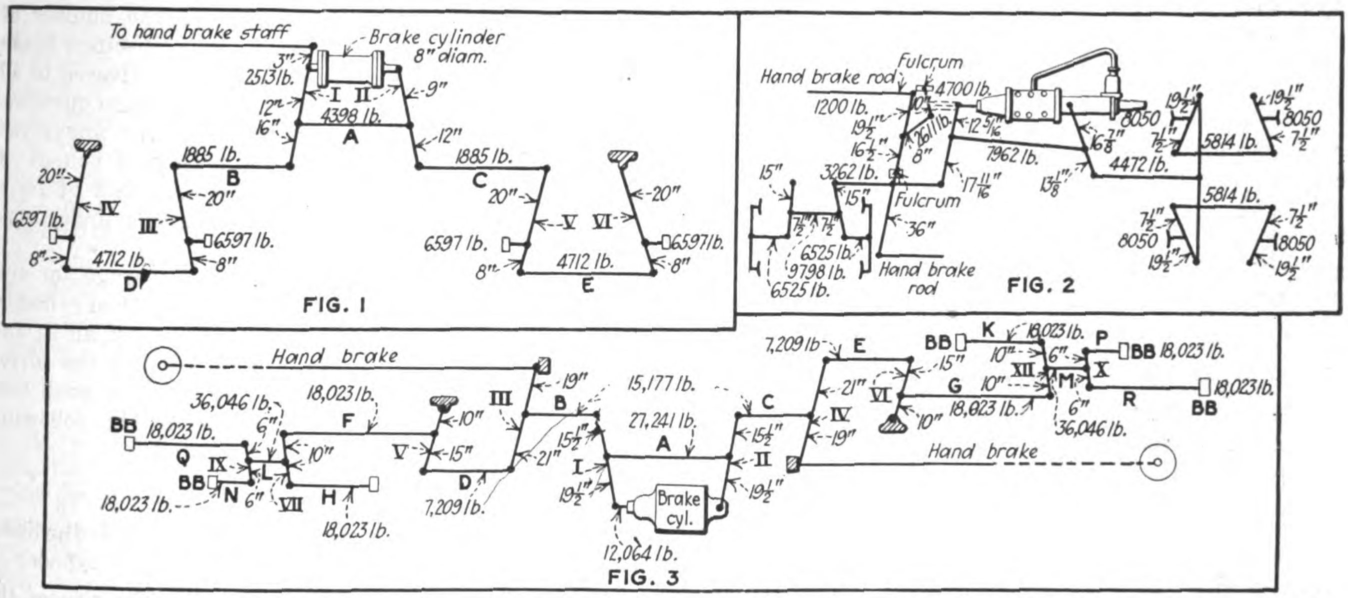

To hand brake staff
Brake cylinder 8" diam.
3"
2513 lb.
I
II
9"
12"
16"
4398 lb.
A
12"
1885 lb.
B
1885 lb.
C
20"
IV
6597 lb.
III
20"
6597 lb.
8"
4712 lb.
8"
D
20"
V
VI
20"
6597 lb.
6597 lb.
8"
4712 lb.
8"
E
FIG. 1
Fulcrum
Hand brake rod
4700 lb.
1200 lb.
10"
$19\frac{1}{2}$"
2611 lb.
$12\frac{5}{16}$"
$16\frac{1}{2}$"
8"
7962 lb.
$16\frac{7}{8}$"
8050
$19\frac{1}{2}$"
$7\frac{1}{2}$"
5814 lb.
$19\frac{1}{2}$"
8050
$7\frac{1}{2}$"
4472 lb.
15"
3262 lb.
15"
$17\frac{11}{16}$"
$13\frac{1}{8}$"
Fulcrum
36"
$7\frac{1}{2}$"
$7\frac{1}{2}$"
6525 lb.
9798 lb.
6525 lb.
Hand brake rod
5814 lb.
$7\frac{1}{2}$"
8050
$19\frac{1}{2}$"
$7\frac{1}{2}$"
8050
$19\frac{1}{2}$"
FIG. 2
Hand brake
36,046 lb.
18,023 lb.
BB
18,023 lb.
6"
F
10"
III
19"
B
15,177 lb.
Q
IX
10"
V
15"
$15\frac{1}{2}$"
27,241 lb.
A
BB
L
21"
I
D
N
6"
VII
H
18,023 lb.
7,209 lb.
$19\frac{1}{2}$"
Brake cyl.
12,064 lb.
18,023 lb.
7,209 lb.
E
BB
K
18,023 lb.
P
BB 18,023 lb.
10"
15"
6"
XII
X
C
21"
VI
G
10"
M
18,023 lb.
$15\frac{1}{2}$"
IV
19"
10"
18,023 lb.
6"
R
BB
36,046 lb.
II
Hand brake
$19\frac{1}{2}$"
FIG. 3

FIG. 1—BRAKE LEVERAGE DIAGRAM FOR DOUBLE-TRUCK FOUR-MOTOR CAR. FIG. 2—BRAKE LEVERAGE DIAGRAM FOR CAR WITH MOTOR AND TRAILER TRUCKS; 32,200 LB. ON MOTOR TRUCK AND 14,500 LB. ON TRAILER TRUCK. FIG. 3—BRAKE LEVERAGE DIAGRAM FOR CAR WITH SIX WHEEL TRUCKS

GETTING EQUALIZED HAND BRAKING ON CARS EQUIPPED WITH EQUALIZED AIR BRAKE RIGGINGS

When a foundation brake rigging is so designed that the air brake portion is equalized the hand brake portion will also be equalized if the hand brake chain, or rod, is attached to any one of the air brake levers at some point which constitutes a fixed center during an application of the air brake or if the attachment be made to the push rod pin of the cylinder lever. If, however, the hand brake chain, or rod, be attached to any other point of any of the air-brake levers the hand brake will not be equalized.

In order to illustrate the preceding rule, consider the brake rigging shown in Fig. 3. In this case the hand-brake chains, or rods, are connected to air-brake levers at points which constitute fixed centers during an application of the air brake and therefore as the air-brake portion of the rigging is known to be equalized the hand-brake rigging will also be equalized.

As a further illustration, it is apparent that the form of car hand brake shown in Fig. 1 is not equalized, for by inspecting this it will be observed that the hand-brake-chain rod is connected to the cylinder lever at a point 3 in. beyond the push rod pin center. In general, the greater the distance between these two points the farther will the hand brake be from the equalized type. Consequently it is important to make the dimension referred to as small as possible, 3 in. being the maximum distance that should be used. The proper construction is, of course, that in which the push rod and hand brake chain rod are attached to the same pin.

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*This is the fifth of a series of articles on forces developed in brake riggings. Others appeared in the Jan. 15, Feb. 19, March 19 and April 16 issues of this paper.

In order to ascertain just what inequality of braking force results from the use of the improperly connected hand brake referred to in the preceding paragraph and illustrated in Fig. 1, let it be required to find the force delivered to each of the four brake beams when a pull of 1,200 lb. is exerted on the hand-brake chain.

Considering the middle point of lever *I* as the fulcrum,

$$\text{Force on rod } B = \frac{1{,}200 \times 15}{16} = 1{,}125 \text{ lb.}$$

and, considering the lower end point of lever *III* as the fulcrum,

$$\text{Force on brake beam of lever } III = \frac{1{,}125 \times 28}{8} = 3{,}938 \text{ lb.}$$

and by finding the force on rod *D*, the force on the brake beam attached to lever *IV* is also found to be 3,938 lb.

Now the force on rod *A* may be found by considering the lower end point of lever *I* as the fulcrum, thus:

$$\text{Force on rod } A = \frac{1{,}200 \times 31}{16} = 2{,}325 \text{ lb.}$$

and by considering the upper end point of lever *II* as the fulcrum,

$$\text{Force on rod } C = \frac{2{,}325 \times 9}{21} = 996 \text{ lb.}$$

and considering the lower end point of lever *V* as the fulcrum,

$$\text{Force on brake beam of lever } V = \frac{996 \times 28}{8} = 3{,}486 \text{ lb.}$$

and the force delivered to the brake beam of lever *VI* may also be shown to be equal to 3,486 lb.

Thus is it seen that owing to the specified method of attaching the hand-brake chain to the cylinder lever the hand brake is not properly equalized, the force delivered to each of the brake beams of the left-hand truck being 452 lb. greater than the force delivered to each of the beams of the right-hand truck, under the conditions assumed. However, as this variation in braking force is not excessive, the given method of connecting the hand brake with the main leverage system is generally considered as satisfactory. Moreover, although the hand brake in question is not equalized, attention should be called to the fact that in a preceding example it was shown that the air-brake portion of the apparatus is equalized.

BRAKING POWER OR BRAKING FORCE DEFINED

The term total braking power or total braking force simply means the total force (in pounds) with which the brake shoes, on the wheels considered, are forced against the tires.

As braking power must obviously depend not only on the design of the foundation brake rigging and on the size of the brake cylinder but also on the air pressure existing in the brake cylinder it is always essential to specify the "cylinder pressure" considered when discussing the subject of braking power. In cases where a hand brake is the source of power the force applied to the hand wheel should be stated whenever the subject of braking power is involved.

The term "percentage of braking power" means the ratio of the total braking power, on the wheels considered, to the total weight with which these wheels press on the rails; that is, to find the percentage of braking power, in any case, divide the total braking power by the total weight on the wheels in question and multiply this result by 100, in order to express it in the form of a percentage.

It is also clear that in this case the "brake cylinder pressure" must always be specified, for the percentage of braking power depends on the total braking force, which, as previously pointed out, is directly dependent on the air pressure existing in the brake cylinder. Consequently it is customary to state that a car is braked at a certain per cent of its weight when the "cylinder pressure" has some specified value, or to say that the percentage of braking power on a particular car is a certain amount, based on a specified cylinder pressure.

The preceding definition may be expressed in the following mathematical form, if the cylinder pressure is clearly stated:

$$\text{Percentage of braking power} = 100 \times \frac{\text{total braking force on specified wheels}}{\text{total weight on specified wheels}}$$

The term "total leverage" represents the number of times that the total force, exerted on a specified brake cylinder push rod, is multiplied in being delivered to all of the brake shoes controlled by the cylinder in question, or, in other words, the total leverage, for any given case, simply represents the total number of pounds of brake shoe pressure obtained for each pound of force developed by the push rod of the brake cylinder concerned.

To determine the value of the total leverage for any given brake rigging, connected with a specified cylinder, divide the total braking force developed on all of the beams or shoes controlled by the cylinder by the corresponding total force exerted on the cylinder push rod.

This rule may be concisely stated in the following mathematical form:

$$\text{Total leverage} = \frac{\text{total braking force developed by specified cylinder}}{\text{total force on push rod of specified cylinder}}$$

In using the preceding rule, neither the size of the cylinder nor the amount of air pressure need be known, as the total braking force developed may always be found in terms of the total push rod force. In other words, as the term "total leverage" simply represents the force-multiplying ability of a brake rigging, it is dependent only on the design of the rigging and is in fact a constant quantity for any given set of levers or other force-multiplying devices. Consequently when computing total leverage the force exerted by the cylinder push rod may be assigned any convenient value whatever. Particular attention should, moreover, be called to the fact that in all cases it is essential to consider each cylinder with the brake rigging controlled by it alone as a separate and independent system. This is a most important factor in all total leverage problems, but especially in the case of a car or locomotive which is equipped with more than one brake cylinder.

In order to illustrate the methods outlined in the preceding paragraphs for the computation of braking power, percentage of braking power and total leverage, the following examples are of interest:

Consider the brake rigging illustrated in Fig. 1 and let it be required to find the total leverage for this case. As the magnitude of the push rod force does not affect the value of the total leverage of any given brake rigging and, therefore, as any force whatever may be assumed as acting on the push rod, it is generally considered best to employ a force of 1 lb. unless the total braking force has previously been computed by the use of some greater value for the push rod force. Consequently, let it be assumed, in this case, that a force of 1 lb. is delivered by the cylinder push rod to the upper end of lever I, then to find the total braking force developed by the cylinder (*i.e.*, the total braking force on the whole car, as all of the brake beams are controlled by the specified cylinder) consider the middle point of lever I as the fulcrum and apply the "General Leverage Rule," thus:

$$\text{Force on rod } B = \frac{(\text{force on push rod}) \times (\text{lever arm of force on push rod})}{\text{Lever arm of force on rod } B}$$

$$\text{Force on Rod } B = \frac{1 \times 12}{16} = \frac{3}{4} = .75 \text{ lb.}$$

Also by considering the lower end point of lever *III* as the fulcrum,

$$\text{Force on brake beam of lever } III = \frac{.75 \times 28}{8} = 2.625 \text{ lb.}$$

Now by continuing this method throughout the system, the force acting on each of the three remaining brake beams will also be found to be equal to 2.625 lb., and, therefore, the total braking force developed by the push rod force of 1 lb. is 4 × 2.625 = 10.5 lb., that is, 10.5 lb. of brake shoe pressure are developed by each pound of force exerted on the cylinder push rod, and consequently the total leverage is 10.5 (see definition of total leverage). If, however, it is desired to apply the rule for determining total leverage when the total braking force and corresponding total push rod force are known, it may, of course, be accomplished thus:

$$\text{Total leverage} = \frac{10.5}{1} = 10.5$$

It will be noted that in the preceding example neither the size of brake cylinder nor the cylinder air pressure were considered, the solution depending only on the proportions of the levers and the number of brake beams (*i.e.*, the number of pairs of brake shoes) but, of course, this problem could have been solved by assuming a definite size of brake cylinder and definite degree of cylinder pressure; thus with the brake rigging shown in Fig. 1 and with an 8-in. diameter cylinder and an air pressure of 50 lb. per square inch, the total force on the push rod is 2,513 lb. and the force delivered to each of the four brake beams of the rigging illustrated is 6,597 lb. Consquently the total braking force developed on the whole car is 4 × 6,597 = 26,388 lb., whence by aid of the rule for computing total leverage,

$$\text{Total leverage} = \frac{\text{total braking force developed by specified cylinder}}{\text{total force on push rod of specified cylinder}}$$

$$\text{Total leverage} = \frac{26,388}{2,513} = 10.5$$

From the preceding discussions it is clear that the value of the total leverage for any given brake rigging may always be computed by first assuming that either a force of 1 lb. or any other specific value is exerted on the cylinder push rod, thereby calculating the resulting forces delivered to each of the brake beams or shoes controlled by the cylinder in question, and finally by dividing the sum of all of these last mentioned forces by the assumed force on the push rod.

Suppose now that the car, on which the brake rigging shown in Fig. 1, is installed, weighs 35,000 lb. and let it be required to find the percentage of braking power on this car when a brake cylinder pressure of 50 lb. per square inch is developed.

As shown in the preceding discussion the total braking force (or braking power) on all of the specified wheels (*i.e.*, for the whole car in this case) is equal to 26,388 lb. when an 8-in. cylinder is used and the air pressure is 50 lb. per square inch. Consequently,

$$\text{Percentage of braking power} = 100 \times \frac{\text{total braking force on specified wheels}}{\text{total weight on specified wheels}}$$

$$\text{Percentage of braking power} = 100 \times \frac{26,388}{35,000}$$

$$= 75.4 \text{ per cent (based on 50-lb. cylinder pressure)}$$

As an additional example consider the American equalized driver brake rigging illustrated in Fig. 4 and let it be required to find the total leverage and the percentage of braking power when two 16-in. diameter cylinders are used and the air pressure is 50 lb. per square inch, the total weight on the drivers being 107,000 lb. The total braking force on each shoe is 13,404 lb. and therefore the total braking force on all six shoes is 6 × 13,404 = 80,424 lb. Consequently,

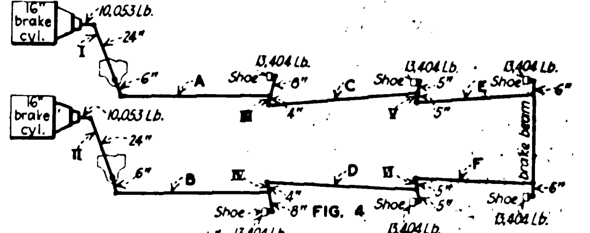

16" brake cyl.
10,053 Lb.
24"
I
6"
A
13,404 Lb.
Shoe
8"
III
4"
C
13,404 Lb.
Shoe
5"
V
5"
E
13,404 Lb.
Shoe
6"
brake beam
16" brake cyl.
10,053 Lb.
24"
II
6"
B
IV
D
VI
F
4"
8"
Shoe
13,404 Lb.
5"
5"
Shoe
13,404 Lb.
6"
Shoe
13,404 Lb.

FIG. 4

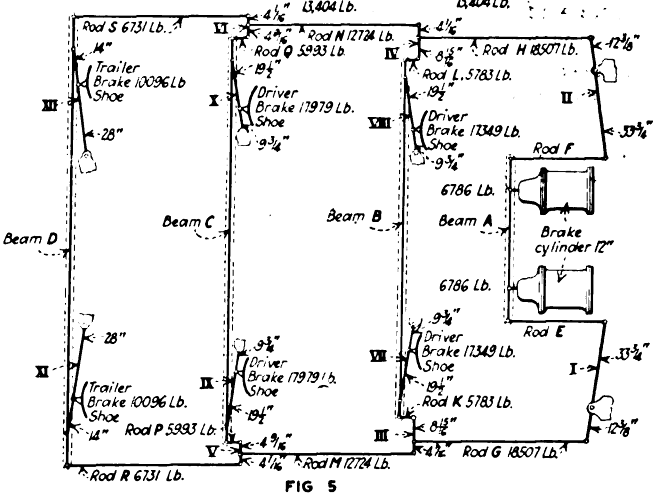

Rod S 6731 Lb.
VI
4 1/16"
4 9/16"
Rod N 12724 Lb.
Rod Q 5993 Lb.
4 1/16"
IV
8 15/16"
Rod H 18507 Lb.
12 3/8"
14"
Trailer Brake 10096 Lb Shoe
XII
28"
19 1/2"
X
Driver Brake 17979 Lb. Shoe
9 3/4"
Rod L 5783 Lb.
19 1/2"
VIII
Driver Brake 17349 Lb. Shoe
9 3/4"
II
33 3/4"
Rod F
6786 Lb.
Beam D
Beam C
Beam B
Beam A
Brake cylinder 12"
6786 Lb.
Rod E
28"
XI
Trailer Brake 10096 Lb. Shoe
14"
Rod P 5993 Lb.
9 3/4"
IX
Driver Brake 17979 Lb. Shoe
19 1/2"
V
4 9/16"
4 1/16"
Rod M 12724 Lb.
Rod R 6731 Lb.
9 3/4"
VII
Driver Brake 17349 Lb. Shoe
19 1/2"
Rod K 5783 Lb.
III
8 15/16"
4 1/16"
Rod G 18507 Lb.
I
33 3/4"
12 3/8"

FIG 5

FIG. 4—LEVERAGE SYSTEM FOR AMERICAN EQUALIZED DRIVER BRAKE. FIG. 5—AMERICAN EQUALIZED BRAKE APPLIED TO ATLANTIC TYPE LOCOMOTIVE

$$\text{Percentage of braking power} = 100 \times \frac{80,424}{107,000}$$

$$= 75.2 \text{ per cent (based on 50-lb. cylinder pressure)}$$

Now in determining the total leverage, for this case, where two brake cylinders are used, it is merely necessary to consider each side of the engine as a separate system, which it really is, and to find the total shoe pressure developed by each cylinder alone. By referring to Fig. 4 it is seen that each cylinder controls three shoes (*i.e.*, the shoes on one side of the engine), the total shoe pressure developed by one cylinder is, therefore, 3 × 13,404, or 40,212 lb., and as the force acting on the push rod of either cylinder is 10,053 lb.

$$\text{Total leverage} = \frac{40,212}{10,053} = 4$$

In each of the preceding examples it happened that the weights of the cars and locomotives were approximately evenly distributed on all of the wheels considered, but it should be pointed out that this is not always the case; for instance, on cars with maximum traction trucks there is much more weight on each of the drivers than on the trailer wheels, and consequently the shoe pressure on these two classes of wheels will not be the same although the same brake cylinder is used for both. This makes no difference, however, in figuring the total leverage and total braking force, but when calculating the percentage of braking power care should be taken not to confuse the average percentage on the two classes of wheels with the specific percentage on each separate class, as these are not necessarily the same.

EXAMPLES OF DIFFERENT PERCENTAGES OF BRAKING POWER ON DRIVERS AND TRAILERS

In order to illustrate the statements just made, consider the leverage system shown in Fig. 5, which is a standard form of the American equalized brake as applied to an Atlantic type of locomotive. Let it be required to find the total leverage, total braking force, average percentage of braking power and specific percentage of braking power for the drivers and trailers, when each brake cylinder is 12 in. in diameter and the air pressure is 60 lb. per square inch. The total weight on the drivers is 78,500 lb., which is evenly distributed on the four wheels, and the weight on the trailers is 28,000 lb.

Under the given conditions the total force exerted on each cylinder push rod is 6,786 lb. and the resulting braking force developed on each of the two forward driver shoes is 17,349 lb., while on each of the rear driver shoes the braking force is 17,979 lb. The braking force developed on each of the trailer shoes is 10,096 lb. Consequently the total braking force for the drivers and trailers is equal to

$$2 \times 17{,}349 + 2 \times 17{,}979 + 2 \times 10{,}096 = 90{,}848 \text{ lb.}$$

or the total braking force developed by each cylinder on either side of the locomotive (*i.e.*, on two drivers and one trailer) is equal to 45,424 lb., and, as the total force on each brake cylinder push rod is 6,786 lb.

$$\text{Total leverage} = \frac{45{,}424}{6{,}786} = 6.7$$

Now to find the average percentage of braking power it is, of course, merely necessary to divide the total braking force, 90,848 lb. for the drivers and trailers, by the total weight on the drivers and trailers and to multiply this result by 100, the total weight being 78,500 + 28,000 = 106,500 lb., thus,

$$\text{(Average) per cent of braking power} = 100 \times \frac{\text{total braking force on four drivers and two trailers}}{\text{total weight on four drivers and two trailers}}$$

$$\text{(Average) per cent of braking power} = 100 \times \frac{90{,}848}{106{,}500}$$

$$= 85.3 \text{ per cent (based on 60-lb. cylinder pressure)}$$

Also as the total braking force on the trailers is equal to 2 × 10,096 = 20,192 lb.

$$\text{(Specific) per cent of braking power on trailers} = 100 \times \frac{\text{total braking force on two trailers}}{\text{total weight on two trailers}}$$

$$\text{(Specific) per cent of braking power on trailers} = 100 \times \frac{20{,}192}{28{,}000} = 72.1 \text{ per cent}$$

(Based on 60-lb. cylinder pressure) and as the total braking force on the drivers is equal to 2 × 17,349 + 2 × 17,979 = 70.656 lb.

$$\text{(Specific) per cent of braking power on drivers} = 100 \times \frac{\text{total braking force on four drivers}}{\text{total weight on four drivers}}$$

$$\text{(Specific) per cent of braking power on drivers} = 100 \times \frac{70{,}656}{78{,}500} = 90 \text{ per cent (based on 60 lb. cylinder pressure)}$$

Thus, it is seen that in order to get a correct idea of the true percentage of braking power it is necessary to consider each set of wheels separately, when the braking force applied to each is unequal and the weight of the car or locomotive is unevenly distributed.

In the preceding example, the percentages of braking power on the drivers and trailers were not the same, but in many cases, although the weight of the car or engine may not be evenly distributed on all of the wheels, the same percentage of braking power is used on all wheels; that is, the force with which the shoes are pressed against each pair of wheels bears a uniform ratio to the weight upon them.

DETERMINING TOTAL BRAKING FORCE WHEN TOTAL WEIGHT AND PERCENTAGE OF BRAKING POWER ARE SPECIFIED

By referring to the definition of "percentage of braking power," it will be observed that, by transposing the members of the typical equation there given, a very useful rule for the determination of total braking force may be readily obtained and stated as follows:

To find the total braking force developed on a given set of wheels by a specified cylinder pressure, divide the corresponding percentage of braking power by 100 and multiply the quotient thus obtained by the total weight on the wheels in question.

This rule may be stated in the following concise mathematical form for any given cylinder pressure and specific set of wheels:

$$\text{Total braking force} = \frac{\text{Percentage of braking power}}{100} \times \text{(total weight)}$$

In order to illustrate the preceding rule, let it be required to find the total braking force developed on a car weighing 40,000 lb. when the cylinder pressure is 50 lb. per square inch and the corresponding percentage of braking power obtained on all wheels is 60 per cent.

To solve this problem apply the rule, thus:

$$\text{Total braking force on car} = \frac{\text{(percentage of braking power)}}{100} \times \text{(total weight of car)}$$

$$\text{Total braking force on car} = \frac{60}{100} \times 40{,}000 = 24{,}000 \text{ lb.}$$

Now let it be required to find the total braking force developed on the trailer wheels of an Atlantic type locomotive, when the total weight on these wheels is 30,000 lb. and the brake cylinder pressure is 50 lb. per square inch, the corresponding percentage of braking power obtained being 60 per cent.

To solve this problem, apply the rule, thus:

$$\text{Total braking force on trailers} = \frac{\text{(percentage of braking power)}}{100} \times \text{(total weight on trailers)}$$

$$\text{Total braking force on trailers} = \frac{60}{100} \times 30{,}000 = 18{,}000 \text{ lb.}$$

A most important consideration connected with the subject of braking power is the marked variation in the percentage of braking power which always results from the loading or unloading of a car. Of course, the greater the total weight of a car, equipped with a specified design of foundation brake rigging, the smaller will the percentage of braking power be for any given cylinder pressure. (See definition of percentage of braking power.) In order to show how great a difference exists between the percentages of braking power obtained on empty and loaded cars, the following example will be given.

A car weighing 46,000 lb. when empty is braked at 60 per cent with 50-lb. cylinder pressure. Let it be required to find the percentage of braking obtained on this car when it carries a load of 92,000 lb. and all other conditions remain unchanged.

In order to find the percentage of braking power developed, it is, of course, necessary to ascertain the total weight of the car when loaded and the total braking force developed under the specified conditions. These quantities may be found as follows:

Total weight = (weight of empty car) + (weight of load)
Total weight = 46,000 + 92,000 = 138,000 lb.

and as the percentage of braking power obtained on the empty car (which weighs 46,000 lb.) is 60 per cent, the total braking force developed by the specified cylinder pressure of 50 lb. may be determined by the rule given in the preceding paragraph, thus:

$$\text{Total braking force on car} = \frac{\text{(percentage of braking power)}}{100} \times \text{total weight}$$

$$\text{Total braking force on car} = \frac{60}{100} \times 46{,}000 = 27{,}600 \text{ lb.}$$

whence, by referring to the definition of percentage of braking power,

$$\text{Per cent of braking power on loaded car} = 100 \times \frac{\text{total braking force on specified wheels}}{\text{total weight on specified wheels}}$$

$$\text{Per cent of braking power on loaded car} = 100 \times \frac{27{,}600}{138{,}000}$$

$$= 20 \text{ per cent (based on 50-lb. cylinder pressure)}$$

Although the method outlined in the preceding paragraphs is perfectly general, a much shorter method for obtaining the same results may be stated as follows:

When the percentage of braking power, developed by a certain cylinder pressure, is known for a car of given weight, to find the percentage of braking power obtained on the same car under similar conditions, but with a new specified total weight, multiply the known percentage by the given original weight and divide this product by the new specified total weight.

This rule may be expressed in the following concise mathematical form:

$$\text{Per cent of braking power with new total weight} = \frac{\text{(per cent of braking power with original weight)} \times \text{original weight}}{\text{new total weight}}$$

To illustrate the use of this simplified rule, let it be required to solve the example given in the preceding paragraph by its aid. The necessary data are as follows: Original weight (of empty car) = 46,000 lb., new total weight (of car and load) = 138,000 lb., and percentage of braking power obtained with original weight (and 50-lb. cylinder pressure) = 60 per cent. The rule may now be applied thus:

$$\text{Per cent of braking power with new total weight} = \frac{60 \times 46{,}000}{138{,}000} = 20 \text{ per cent (based on 50-lb. cylinder pressure)}$$

By referring to any of the braking power or leverage examples given in the foregoing, it will be readily seen that if, in each of the cases considered, the brake cylinder pressure had been doubled, the force with which each shoe was pressed against its wheel would also have been doubled, or that, if the brake cylinder pressure had been reduced to half of its given value, the force with which each shoe was pressed against its wheel would also have been reduced to one-half of its original value. In general it is true, therefore, that the shoe pressure varies in direct proportion to the brake cylinder pressure and consequently that the percentage of braking power also varies in direct proportion to the brake cylinder pressure. Now when computing braking force and percentage of braking power it is often necessary to find the value of these quantities corresponding to various degrees of cylinder pressure, the following rule will, therefore, be found of much practical value in such cases.

If a known degree of braking force, or percentage of braking power, is developed by a given brake cylinder pressure, the value which either of these quantities will have, when a new specified brake cylinder pressure is employed as a basis, may be found by dividing the given braking force, or percentage of braking power, by the original cylinder pressure on which it is based and then multiplying the quotient thus obtained by the new cylinder pressure on which the required braking force, or percentage of braking power, is to be based.

This rule may be concisely stated in the following mathematical form:

$$\text{Total braking force based on new cylinder pressure} = \frac{\text{(original total braking force)}}{\text{(original cylinder pressure)}} \times \text{(new cylinder pressure)}$$

$$\text{Per cent of braking power based on new cylinder pressure} = \frac{\text{(original per cent of braking power)}}{\text{(original cylinder pressure)}} \times \text{(new cylinder pressure)}$$

To illustrate this method let it be required to find the (specific) percentages of braking power and total braking forces for the drivers and trailers of the Atlantic type of locomotive considered in the former examples connected with Fig. 5, when the brake cylinder pressure is 50 lb. per square inch, it having been previously shown, in the examples referred to, that with 60-lb. cylinder pressure, the total braking force on the trailers is 20,192 lb. and on the drivers 70,656 lb., while the percentage of braking power obtained on the trailers is 72.1 per cent and on the drivers 90 per cent.

By noting that the "new cylinder pressure" is 50 lb. and the original cylinder pressure is 60 lb. in this case and applying the rule the desired results may readily be obtained as follows:

For trailers: Per cent of braking power based on 50-lb. cylinder pressure $= \frac{72.1}{60} \times 50 = 60.1$ per cent

For drivers: Per cent of braking power based on 50-lb. cylinder pressure $= \frac{90}{60} \times 50 = 75$ per cent.

For trailers: Total braking force based on 50-lb. cylinder pressure $= \frac{20{,}192}{60} \times 50 = 16{,}827$ lb.

For drivers: Total braking force based on 50-lb. cylinder pressure $= \frac{70{,}656}{60} \times 50 = 58{,}880$ lb.

One-Man Rear-Exit Cars

Seattle Has Arranged Twenty-seven Large Two-Man Cars for One-Man Operation in Unique Way—The Seating Capacity Sixty—The Operators Have No Difficulty in Handling Them

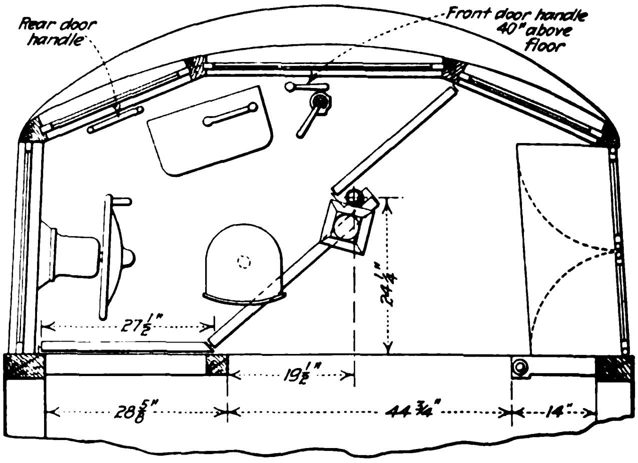
UNDER municipal operation, Seattle has extended one-man operation from safety cars to large double-truck two-man cars. This plan of operating some of the larger cars has been adopted with only slight changes in the arrangement of the cars, costing about $100 per car. These changes included permanently closing the rear entrance-door and connecting the rear exit-door in such a manner that the operator at the forward end has control of it. This was accomplished by running a rod the entire length of the car just under the left-hand sill and making proper connections with the door levers underneath the car step. The motorman's cab on the left-hand side of the front platform was removed, and the sand box formerly located therein was moved inside the car and placed under a seat. The bulkhead door at the front end was widened to 44 in., as shown in the accompanying drawing, which also shows the arrangement of fare box, curtains, etc. The controller, operator's seat and air valves were relocated as seen and air sanders, rear-door operating mechanism and a geared-wheel type of hand brake installed at the left of the operator.

In general, the plan embodied the changing of the single-end, rear-entrance and rear and front-exit two-man car into a front-entrance, rear-exit, single-end, one-man car. The following details and accompanying photographs will serve to indicate the type of equipment which has been converted for one-man operation:

Length over all	49 ft.
Width	8 ft. 7 in.
Length of body	38 ft. 6 in.
Truck centers	29 ft.
Seating capacity	60
Motors, 2 Westinghouse, 310-C	
Weight	40,360 lb.

Commenting on this scheme, D. W. Henderson, general superintendent of railways for the city of Seattle, said: "We converted twenty-seven cars of this type for one-man operation and they have been running since March 1, 1921. The trainmen are very well pleased with the car and we have had no complaints whatever from the public."

These large one-man cars have been in use on the "Ballard-North" and "Sixth Avenue, N. W.," lines during the last sixty days and for rush-hour as well as off-peak service. The former line handles about 177,000 passengers per month and the latter about 120,000, which gives some idea of the density of traffic. The average speed called for in the time-table was 8 m.p.h. in January, 9.06 m.p.h. in February and 8.93 m.p.h. in March. A few of these cars have also been operated on other lines where they were interspaced with two-man cars and they are reported to have given very satisfactory service.

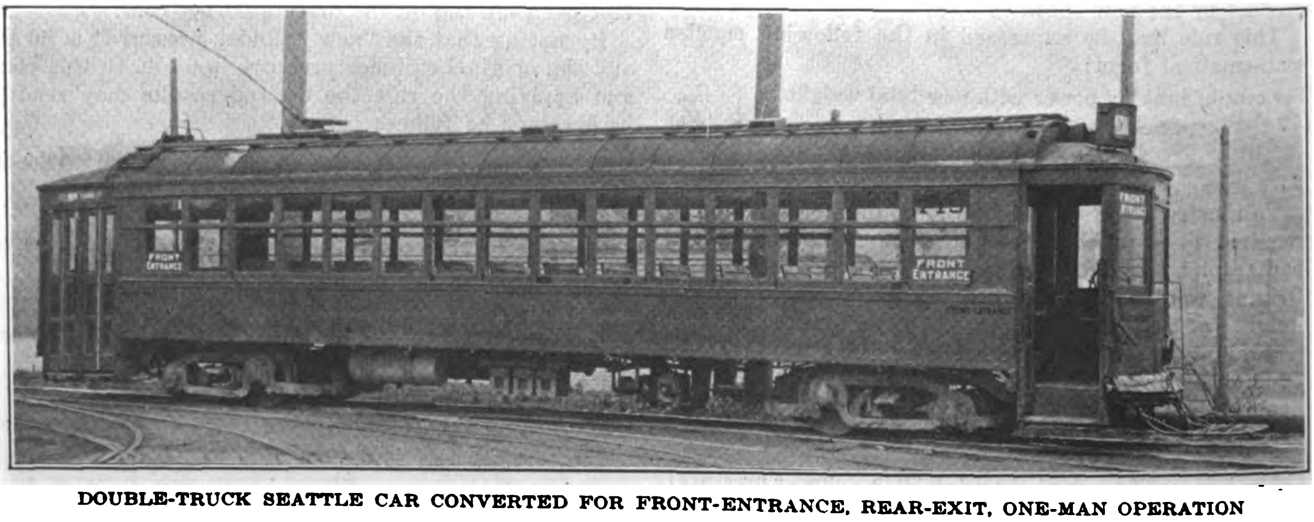


LOCATION AND ARRANGEMENT OF EQUIPMENT ON FRONT PLATFORM OF CONVERTED ONE-MAN CAR

Reclosing Circuit Breaker Gives Ideal Service

ON ONE of the lines in Cincinnati power distribution was found last summer to be rather weak. An analysis of the situation pointed out that what was really needed was a one-unit substation out on this line. It happened that the line ran near a carhouse and a 500-kw., 60-cycle rotary was placed in a room in a corner of the carhouse and equipped with an automatic reclosing circuit breaker which is manufactured by the Automatic Reclosing Circuit Breaker Company of Columbus, Ohio.

One of the carhouse men starts this rotary at 5 o'clock in the morning, sees that it is in good condition and leaves it for the rest of the day. This unit has been in service for about eight months now and has given continued satisfaction and perfect operation during the whole time.



DOUBLE-TRUCK SEATTLE CAR CONVERTED FOR FRONT-ENTRANCE, REAR-EXIT, ONE-MAN OPERATION

Destructive Effect of Current on Ball Bearings of Electric Cars

Tests Made Under Various Conditions Show that Very Rapid Destruction of Ball Bearings Results from the Electric Current Which Flows Through Them—Types of Construction Are Suggested for Overcoming the Trouble and Testing Apparatus Is Described for Reproducing Conditions as They Occur in Service

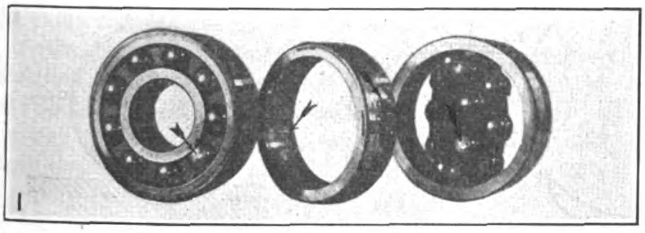
By HILDING ANGSTROM
Chief Assistant Malmo Tramways, Sweden

DURING the past ten years various kinds of ball and roller bearings have been developed for use on electric railway cars and their equipment, both in America and in Europe. All of the bearings necessary for the operation of electric cars are subjected to very severe service caused by the movement of the cars on curves and at switches, by the forces developed when the brakes are applied and through the blows at rail joints. None of the anti-friction bearings developed has performed in the manner expected. In some cases the ball or roller retainer has been too weak. Sometimes the bearings have become "shelled" and destroyed due to the severe pounding action to which they are subjected. In some cases strength has been obtained at the expense of bearing friction.

Some of the bearings which have been tried in service in Europe are:

1. Svenska Kullagerfabriken, Gothenburg, Sweden.
   - (a) Spherical ball bearings, two per housing.
   - (b) Ball bearings with the outer ring turned cylindrical and radial bearings, one per housing.
   - (c) Radial bearings, two per housing.
   - (d) Spherical roller bearings, one per housing.
2. Nordiska Kullager Aktiebolaget, Gothenburg, Sweden.
   - (a) Radial bearings, two per housing.
   - (b) Disk bearings, two per housing.
3. Deutsche Waffenfabriks radial bearings in service on the tramways in Copenhagen, Denmark.
4. Jaeger-Bund-Rollenlager in service on the tramways in Dresden, Germany.
5. S. R. O. double-row radial bearings, Oerlikon, Switzerland, in service on the tramways in Berne and Zurien, Switzerland.
6. Delmez radial bearings, Brussels, Belgium.

In America several of the bearings mentioned above have been tried in actual service, and in addition experiments have been made with several types of American bearings.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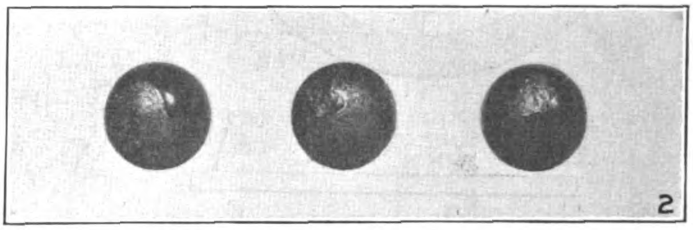
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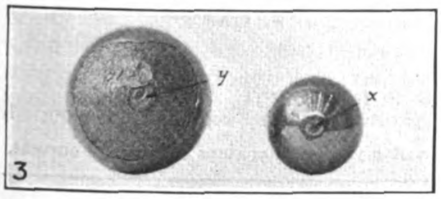

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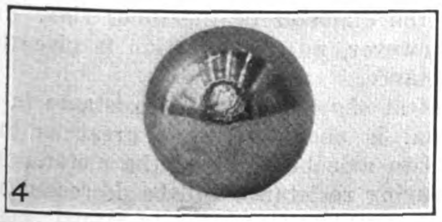
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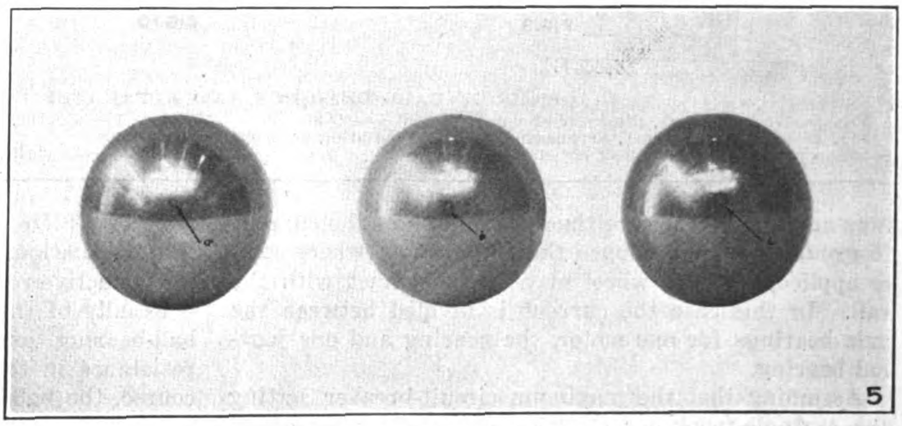
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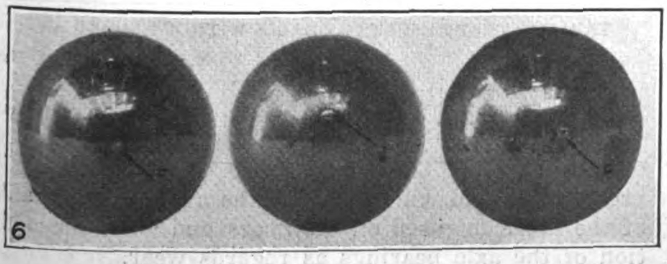
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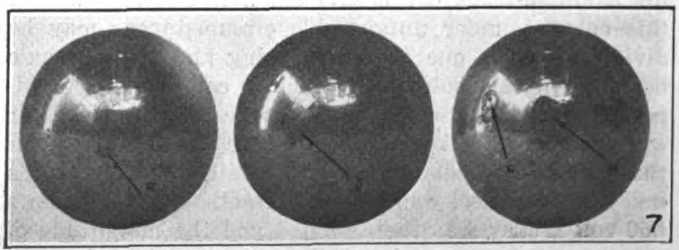
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EFFECT ON BALLS PRODUCED BY RUPTURING CURRENT PASSING THROUGH THEM

Fig. 1—Balls and retainers destroyed by action of current.
Fig. 2—Appearance of balls when removed from retainer.
Fig. 3—Shelling effect produced by arcing.
Fig. 4—Rupturing effect produced by current of 260 amp.
Fig. 5—Balls after being tested with permanent steady load at varying current.
Fig. 6—Effect on balls produced by rupturing current in air.
Fig. 7—Effect on balls produced by rupturing current in oil.

When lightweight safety cars came into use, with higher scheduled speeds and increased rates of acceleration, the value of decreased friction to reduce the load placed on the motors while starting was considered an essential advantage. Tests have been made by the General Electric Company and the Union Actien-Gesellschaft among others to ascertain the destroying influence of current on friction bearings. From these tests it appears that a current as low as 1 amp. per square inch corrodes the housings and that a much smaller current will damage the bearing metal.

With ball bearings there is no insulating oil, as is the case with friction-type bearings, but there is an almost metallic contact.

DISTRIBUTION OF CURRENT IN BEARINGS

With the usual type of single-truck car the current passes from the trolley wheel through the controller and motors directly to the truck. The various motor bearings and the gearing are thus in the path of the current to ground. It may happen that in braking, where sand is applied, but one wheel may be in contact with the rail. In this case the current is divided between the axle bearings for one motor, the gearing and one journal bearing.

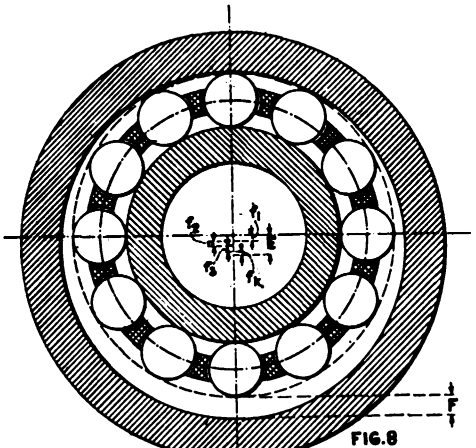


FIG. 8

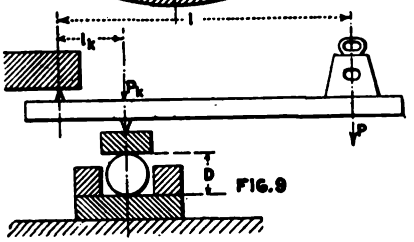


FIG. 9

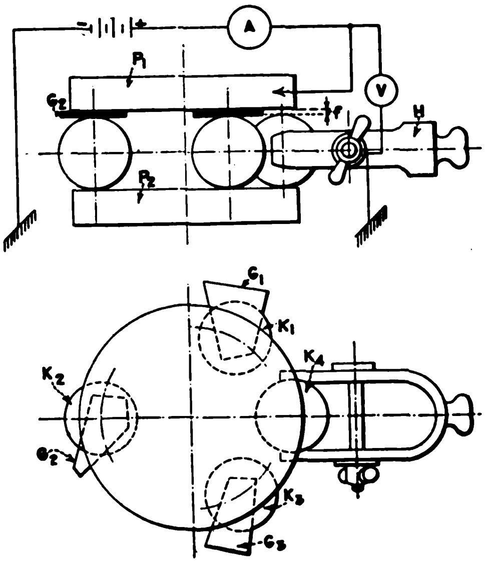


FIG. 10

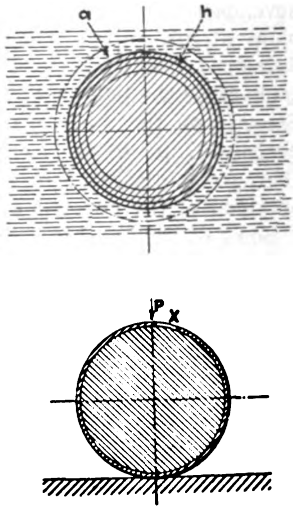


FIG. 11

DIAGRAMS OF BALL BEARINGS AND APPARATUS USED FOR TESTING

Fig. 8—At left (top), diagram of wear on ball bearings.
Fig. 9—At left (bottom), arrangement for determining relation between pressure and contact resistance.
Fig. 10—Center, apparatus used for reproducing arcing from vibration.
Fig. 11—At right, hard layers and craters formed by current.

Assuming that the maximum circuit-breaker setting for a single-truck car is 225 amp., it is possible that this current under unfavorable circumstances may be divided between one journal bearing and the two axle bearings of the motor. In order to confirm this dividing of the current experiments were made with a car equipped with ball bearings. Three of the wheels of this car were insulated from the rails by mica sheets and but one wheel was left in contact. Current from a 550-volt trolley was then applied and the magnitude of the current was regulated through a water rheostat. The value of this current and the voltage drop were read between the ground side of the motors and the rail. This test was repeated with the brake connections insulated and with the motor lifted up from its suspension, so that the current could pass only through the axle bearings and the journal bearings.

If we indicate the intermediate resistance of the two axle bearings by r_y and let r_k represent that for the journal bearings, we have

$$\frac{1}{R} = \frac{1}{r_g} + \frac{1}{r_k}$$

where R is the total resistance. In actual operation this value for the contact resistance is not quite correct, as the current passing through the ball bearings is in reality not a direct current but one of an alternating variety, with a frequency varying with the speed of the car. This frequency may be represented by

$$v = N\frac{D_m - d}{2\,D_m}$$

where v is the frequency, N is the rotative speed of the axle, d is the diameter of the ball, and D_m equals $D_i + d$ if D_i is the diameter of the inner ring. In this calculation, however, no consideration is given to the inductive resistance.

Results of this test showed that the resistance in a ball-bearing journal is about twice as great as the resistance in the two axle bearings of the motor. Of course, the ball-bearing resistance will be decreased by greater load and will vary with the amount and quality of the lubricant used on the gears and with the condition of the axle bearings as regards wear.

TABLE I—TEST RESULTS ON BALLS WITHOUT LUBRICANT

Exp.	Amp.	Volt. Max.	Watt. Max.
a	35	2.4	84
b	80	3.1	248
c	150	13.0	1,950
d	225	11.0	2,475

In the following I shall show that it is not the permanent current load, but the effect of rupturing this current on the balls that produces the welding action.

Tests were made of the magnitude of the maximum rupturing effect. Results of these show that the rupturing effect is sometimes under unfavorable circumstances as much as 7 kw. and this is certainly sufficient to destroy ball bearings.

HOW RUPTURING EFFECT IS PRODUCED

When the balls and the inner and outer rings of the bearing are worn, and the upper balls are pressed together and the inner and outer rings compressed, it is possible that the journal bearing under unfavorable circumstances may be insulated from the bearing box. Such a condition is indicated in Fig. 8, which shows how this play between the balls and the inner and outer rings occurs. If we let f_1 represent the diametrical wear in millimeters of the outer ring, f_2 the diametrical wear in millimeters for the inner ring, f_3 the sum of the diametrical wear in millimeters of the two balls, and f_k the pressing together and the compressing of the upper ball, then

$$E = f_1 + f_2 + f_3 + f_k$$

The play due to the loading and unloading of the bearings and which causes the rupturing effect is evidently $E - f_k$, and practical examinations have shown that this may amount to 0.3 mm. (11.8 mils).

Figs. 1, 2 and 3 show some balls and bearings which have been thus destroyed. In Fig. 1 the balls are still in their retainer. The dark stains on the balls were formerly considered as having been caused by acid in the lubricant or from shelling through fatigue. In Figs. 2 and 3 the balls are shown after removal from their retainer. The shelling effect is quite evident in Fig. 3x. The concentric shelling shown in Fig. 3y was probably due to the formation of a small crater.

Additional experiments have shown that the current distribution among the balls depends to a large extent on the load placed on the balls and that it is the rupturing effect and not the permanent current due to metallic contact that has the most damaging influence on the durability of the balls.

An arrangement for determining the relation between contact resistance and load is shown in Fig. 9. A ball with a diameter of 36.5 mm. (1.44 in.) is placed between two plane disks, the upper loaded through the lever, as shown. The total length of this lever indicated by l is 1,598 mm. (5 ft. 2.96 in.) and l_k is 348 mm. (13.71 in.). This arrangement does not give the same contact resistance as would be obtained by the balls between their inner and outer rings in the ball bearings, but the relative proportion from different loads should be about the same. Fig. 5 shows the effect produced on balls by the current.

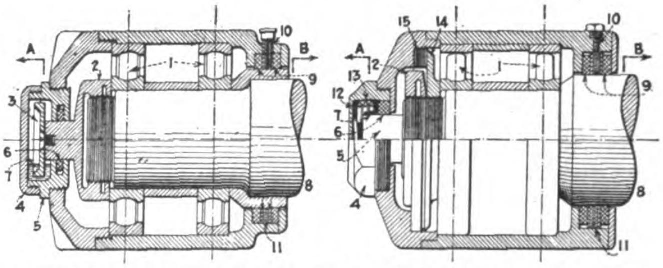
TABLE II—TEST RESULTS ON BALLS WITH LUBRICANT

Exp.	Amp.	Volt. Max.	Watt. Max.
a.	27	1.8	48.6
b.	60	3.8	228.0
c.	90	3.2	288.0

In order to produce in an artificial manner the current breaking which is supposed to take place in ball bearings, the apparatus shown in Fig. 10 was used. Between two plane disks P_1 and P_2 were placed three balls K_1, K_2 and K_3, each having a diameter of 36.5 mm. (1.44 in.). Three mica disks, G_1, G_2 and G_3, were placed between the upper plane disks and the balls. The thickness of the mica disks was measured very accurately. A fourth ball, K_4, was then inserted and to this was screwed a vise H. The diameter of this ball, K_4, was the same as the other balls. The average value for the thickness of the three mica disks should be the distance between the ball K_4 and the plane disk P_1. By measurement this was found to be 0.29 mm. Direct current was then applied to the upper disk P_1, its value being measured by an ammeter A and the drop in potential between the upper disk and the ball K_4 was measured by a voltmeter V.

The ground for the circuit was connected to the vise H and by the raising first of the ball K_4 to make contact with the disk P_1 and then by the lowering of this ball into contact with the disk P_2 an arc was established while readings of current and voltage were taken. Tests were made with four different strengths of current and the balls were changed after every reading. The voltage drop obtained and the maximum wattage is shown in Table I. Figs. 4 and 6 show the effect produced on the balls.

Other balls were then greased freely and the experiment was repeated. It was found that the rupturing effect was increased, but that it was more difficult to maintain the arc on account of the oil breaking it. Fig. 7 shows the effect on the balls in this latter test, and it will be noted that the size of the welded crater is reduced somewhat through the use of lubricant. The voltage and wattage obtained is shown by Table II.



JOURNAL BOXES FITTED WITH AUXILIARY CONTACTS FOR CARRYING CURRENT

Fig. 12—At left, double nut arrangement.
Fig. 13—At right, additional pressure provided by spring.

To illustrate the destroying effect that should be obtained on a ball bearing with a great load applied, let us consider the two balls shown in Fig. 11. The ball shown at the top of Fig. 11 has a hard layer h, which is thicker and more permanent when formed in oil than in water, due to the inferior ability of the oil to conduct heat. The surface layer of the ball as shown at the bottom of Fig. 11 has been pierced by the formation of a crater at z. The effect of the formation of such a crater is to subject the ball to a shearing or bending stress when a heavy load is applied instead of a compressive stress as would be obtained with a perfect ball.

To prevent damage to the balls through the passage of electric current some form of shunting device should be applied. The insulation of the outer ring of the ball bearing is possible, but does not appear advisable, as the repeated blows and shocks to which ball bearings are subjected would probably rupture or at least compress the insulating material, which would then produce additional stresses in the ball bearings. Tests have shown that the transmission of current through lubricated ball bearings may establish a galvanic element through the acids which the oil or lubricant may contain.

A shunt or auxiliary contact arrangement should be placed outside the ball or roller bearing casing and should have such a low resistance that it will practically exclude all transmission of current through the balls or the rollers. The contact arrangement should also be constructed so that it will be easy to inspect.

A journal box fitted with N. K. A. disk bearings is shown in Fig. 13. This type of bearing has rollers which are self-centering, so that they tend to adjust their axis of rotation parallel to the axle of the wheel. The right-hand sides of the bearings shown in Figs. 12 and 13, which are marked *B*, show a current transmission arrangement that can be applied to new bearing boxes. This arrangement consists of two brass rings which bear against the collar of the wheel axle. These brass rings also serve to support the felt rings 9, against which they are pressed by means of a spring. To provide a better contact and a path of less resistance for the current, the space between the brass rings is filled with graphite or mercury. The conducting power of graphite is about 10^{14} times as great as that of oil, and it is thus evident that the use of graphite facilitates the transmission of current to a high degree. This type of box provides a path of low resistance for the current and at the same time gives a very tight construction against the entrance of sand or dust from the outside. The left-hand ends of Figs. 12 and 13 marked *A* show a contact nut arrangement which can be applied to old ball or roller bearing boxes. In general this type of construction corresponds to that just described. In Fig. 12A the current passes through the double nut at 4 and 5 to the graphite or mercury layer 7 and then to the contact disks 3, contact pin 2, and then to the axle of the wheel. In Fig. 13A the nut arrangement is simplified somewhat and the tightening ring has been made more effective by the use of a spring bearing on a brass contact disk 7. The path of the current in this construction is through the contact nut 4, the contact spring 12 and the contact disk 7 to the contact pin 5 and then to the axle of the wheel. These types of construction have been patented and are now in use on the tramways of Malmo, Sweden.

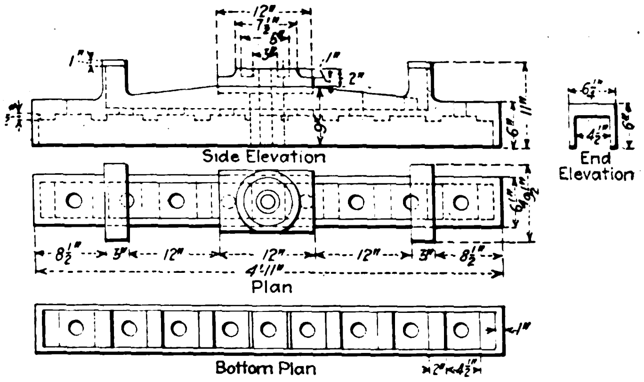
Make Bolster Trucks from Side-Bearing Types

Old Side-Bearing Brill Maximum Traction Trucks Converted Into Bolster Type by the Georgia Railway & Power Company in Atlanta—Specially Designed Bolster Developed

THE Georgia Railway and Power Company, Atlanta, has several open cars which have been used only in intermittent service and they have been inclosing some of these open cars to put into regular daily service rather than extra service. These cars are equipped with Brill Eureka Maximum Traction Truck No. 22, side-bearing type, and the company did not consider this old style truck suitable for continuous service. Rather than to buy new trucks, it tackled the problem of changing these trucks to bolster type, with completely satisfactory results. Some of these trucks have been in daily service practically two years and have developed no trouble. Eight or twelve more of these trucks will be changed over to the bolster type during the coming year.

In the change-over the company used only the former side bars, journal boxes, wheels, axles and springs of the old trucks, using the same motors, too, of course. It was naturally necessary to equip the trucks with newly designed brake rigging throughout and also to equip them with bolster, transom angles and with spring planks.

The bolster with which these trucks are equipped is a specially designed cast iron bolster, made in the foundry of the company in Atlanta. The accompanying drawing indicates the design and dimensions of this bolster, which is so constructed that the company was able to use the four coiled springs which were previously provided in the original truck to carry the car body. These springs are 7 in. long and have six turns of 13/16-in. wire. The diameter of the coil at the top is 4¼ in. and at the bottom 5 in.

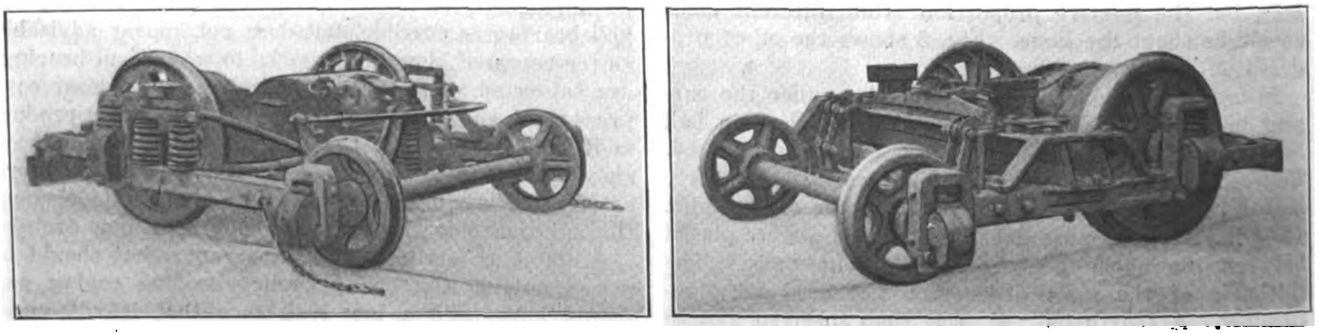


SPECIAL BOLSTER FOR REMODELED TRUCK

The bolster centers are 25 in. from the center of the small wheel axles and 23 in. from the center of the large wheel axles. Twenty-inch and 33-in. wheels are used. In the remodeled truck the motors are outside hung with nose suspension. The motors themselves are Westinghouse No. 68, with a gear ratio of 14 to 68.

The car bodies are some that were built by the company some twenty years ago. As remodeled, the total weight of the body, truck and equipment is 24,500 lb. There is seating capacity for forty passengers. The control on these cars is Westinghouse PK.

The total cost of remodeling these trucks has proved to be about $300 per truck.

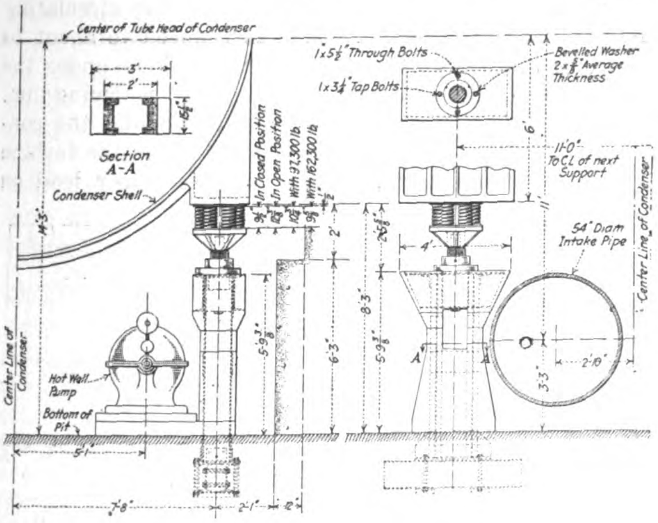


AT LEFT, OLD SIDE-BEARING TRUCK. AT RIGHT, REMODELED TRUCK AS BOLSTER TYPE

Data of New Interborough Turbine

Water Rate of 11 Lb. per Kilowatt-Hour for 30,000-Kw. Turbine Shown by H. B. Reynolds, Research Engineer Interborough Rapid Transit Company, to Have Been Attained in Test—Facts Contained in A. S. M. E. Paper

IN A paper scheduled for presentation at the spring meeting of the American Society of Mechanical Engineers, to be held in Chicago, May 23 to 26, 1921, Herbert B. Reynolds, research engineer Interborough Rapid Transit Company, New York City, gives information regarding the several types of turbine which have been installed by that company during the past dozen years. He also includes the results of tests on the latest unit installed, namely, the three of 30,000-kw. capacity, the installation of which was completed during the past year.



DETAILS OF THE SPRING SUPPORTS FOR THE CONDENSER

Mr. Reynolds said that in order to provide additional power capacity for the new subways constructed in New York City during the period from 1913 to 1921, and operated by the Interborough Rapid Transit Company, additional turbine units were installed in both the Fifty-ninth Street and Seventy-fourth Street power stations. He reminded his readers that the original engine-room equipment of the Fifty-ninth Street power plant consisted of nine 7,500-kw. maximum capacity Manhattan-type Allis-Chalmers double-angle compound engine units and three Westinghouse 1,250-kw. turbines, the latter driving 60-cycle generators which supplied current for subway lighting. Later 25-cycle current was adopted for this lighting, the current being taken from the main units. During 1909 and 1910 five low-pressure 7,500-kw. maximum capacity General Electric turbine units were added, taking exhaust steam from five of the engines at atmospheric pressure.

Two of the new 30,000-kw units in the Fifty-ninth Street plant were installed in the space formerly occupied by the three lighting units, while the third turbine was installed at the western end of the station. The concentration of power possible with modern turbines is strikingly shown by the space they require as compared with that for reciprocating engines. The maximum capacity of the engines visible in the background in the photographs reproduced is but 26,250 kw., while that of the turbine in the foreground is 35,000 kw.

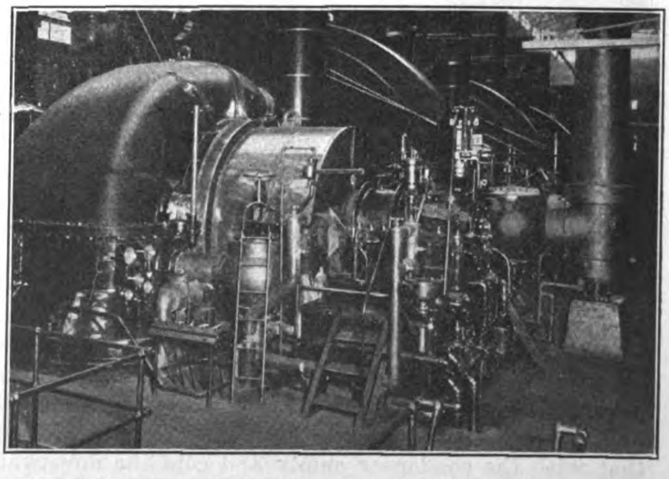
The three 30,000-kw. Westinghouse cross-compound turbines which were completed in 1915 were among the new units installed at the Seventy-fourth Street power station.

In the paper Mr. Reynolds gave structural and design details of the new turbines. Among other things, he said that they are of the straight Curtis impulse type, having twenty pressure stages, each consisting of one velocity stage. The normal steam pressure at the throttle is 225 lb. per square inch, abs., with a superheat of 150 deg. F., exhausting into a vacuum of 29 in. referred to a 30-in. barometer at 58.1 deg. F. The speed is 1,500 r.p.m.

In addition to the primary steam inlet, a secondary valve is provided which opens after the load reaches 24,000 kw. and which enables the turbine to carry a load of 35,000 kw. As all auxiliaries in the station are steam driven, a connection has been provided in the turbine through which any excess auxiliary exhaust steam may be injected. This is at the sixteenth stage of the turbine.

The generators are three-phase, star-connected, generating 25-cycle current at 11,000 volts. The excitation is at 250 volts. The generators are cooled by circulation of air maintained by a fan which forms an integral part of the generator. The air is drawn from the turbine-room basement and discharged from the top of the generator into the turbine room through a short stack.

Each unit comprises one single-shell two-pass Worthington condenser, two Worthington centrifugal circulating pumps, each driven through reduction gears by Kerr turbines; two Worthington centrifugal condensate pumps, each driven by a General Electric turbine, and one Laidlaw-Dunn-Gordon dry vacuum pump. Each condenser contains 50,000 sq.ft. of tube surface in

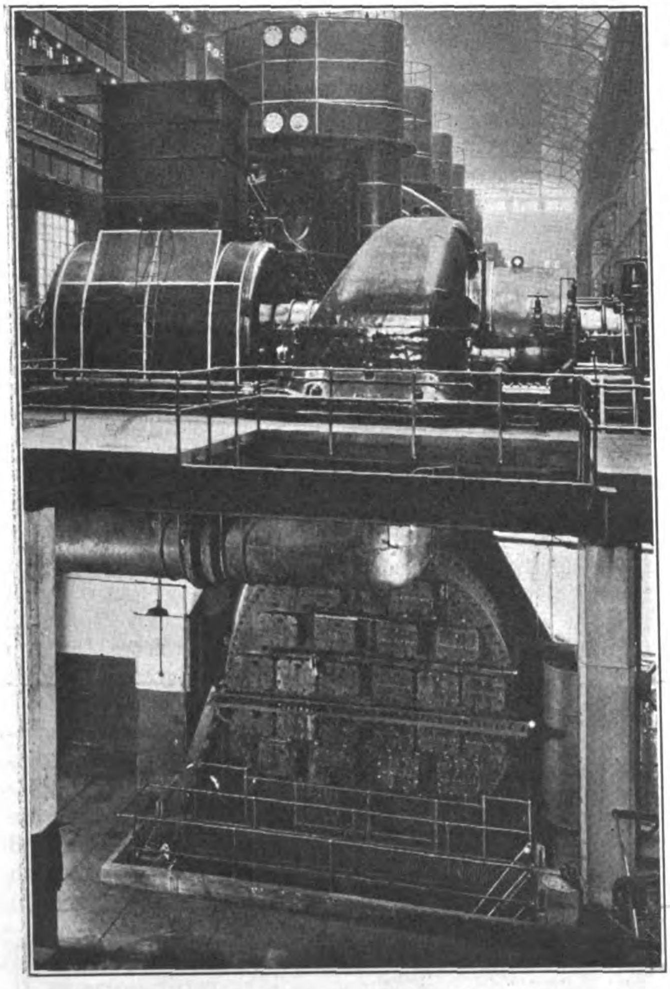


ONE OF THE THREE 30,000-KW. TURBINES INSTALLED AT THE FIFTY-NINTH STREET POWER STATION OF THE INTERBOROUGH RAPID TRANSIT COMPANY IN 1920

10,760 tubes 18 ft. long, 1 in. in outside diameter and of No. 18 B. W. G. thickness. The condenser is of the two-pass type, the water entering at the bottom and passing out at the top. As the condensers are mounted on springs, rubber expansion joints are inserted in the circulating water lines.

ADJUSTMENT OF SPRING CONDENSER SUPPORTS

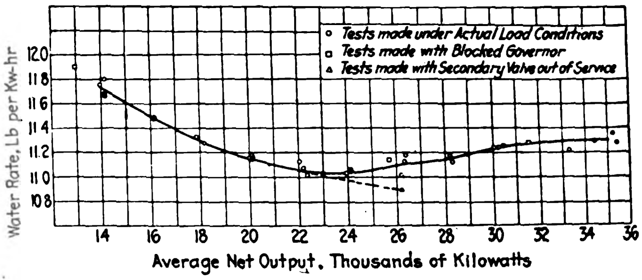
As no expansion joint was provided between the turbine and the condenser, it was necessary to mount the latter on springs, so as to provide for expansion and contraction. The spring supports are shown in one of the illustrations. To facilitate the setting of the springs and provide a means for detecting and adjusting for fatigue in them, hydraulic jacks were incorporated in the condenser supports.



A COMPLETE TURBINE AND CONDENSER UNIT

Mr. Reynolds gave some detail of the procedure followed in setting these springs. He said that after the erection of the condenser and circulating water pipe had been completed, with the exception of making the joint between the condenser and the turbine, the condenser was raised while empty by means of the jacks, leaving ⅜ in. clearance between the face of the turbine outlet and the face of the condenser inlet. The load on each of the four supports was then determined by noting the oil pressure in the jacks. It was decided that with the condenser empty and cold the downward pull on the turbine should not be less than approximately 17 tons. The distance that the joint between turbine and condenser would have to be pulled in order to give this load was estimated from the modulus of elasticity of the turbine and condenser metal. The condenser was then raised to within the predetermined distance of the turbine outlet, which was found to be 0.231 in., after which the lock nuts on the jacks were screwed home and the condenser bolted to the turbine. The load on the springs was then determined with the condenser still empty by noting the pressure required just to raise the lock nuts. Every few months the load carried by the springs will be determined in this manner and compared with the load which existed when the condenser was first bolted to the turbine. Any fatigue which may develop in the spring will be compensated by screwing the lock nuts down.

It was found that the minimum condenser load carried by the turbine with the condenser shell empty was approximately 17 tons. As the water required to fill the condenser weighs about 60 tons the load on the turbine increases to 77 tons when the circulating water pumps are started. This is reduced to about 70 tons due to the compression of the springs under the expansion of the condenser during warming up. Immediately after shutting down, and while the condenser is still warm but drained, the load on the turbine is reduced to 10 tons. Thus, the condenser load on the turbine varies from 10 to 77 tons, out of a total condenser weight varying from 180 to 240 tons.



WATER-RATE CURVE FOR NEW INTERBOROUGH RAPID TRANSIT TURBINE

Dotted line shows results that would probably have been obtained if steady-load tests had been conducted within this range of load where the secondary valve is continually opening and closing.

TESTS SHOWED HIGH THERMAL AND MECHANICAL EFFICIENCY

The equipment used for conducting the turbine tests consisted of two large water-weighing scales for measuring steam consumption, three single-phase rotating standard watt-hour meters for measuring the output, and the necessary thermometers, gages and mercury columns for determining temperatures, pressures and vacua. Most of the tests were of three-hour duration and, with the exception of a few special tests, the turbine was operated under conditions normal as to the type of load.

The results of the tests, in so far as the water rate is concerned, are given in the accompanying curve. The lowest rate obtained while operating under normal conditions was 11.03 lb. per kilowatt-hour. The thermal efficiency, or ratio of the output to the energy in the steam, was 25 per cent. The Rankine efficiency; that is, the ratio of the energy developed to that available within the working range of temperature and pressure, was 75.5 per cent.

In the paper the results of various auxiliary tests were also given, but it is impossible to summarize these within the space limitations of the present abstract.

Railway Valuation in Connecticut—I*

Procedure in Assigning Values to "Inside Plant" Property of a $50,000,000 Railway System

By ARCHER E. KNOWLTON
Instructor in Electrical Engineering, Yale University

IN THE VALUATION of railway property so much time and expense have been involved in most cases that a study of methods which will reduce these items to a minimum is worth while. In presenting this story of the valuation of the property of the Connecticut Company by the Public Utilities Commission of Connecticut, Mr. Knowlton, who serves as the electrical engineer to the commission, points out the philosophy of the commission and its engineers in their efforts to arrive at a fair valuation in moderate time, and at moderate expense. In this installment Mr. Knowlton shows the problem as a whole and tells how the "inside plant" and overheads were treated. In a subsequent installment he will develop the interesting unit-of-construction or "yardstick" bases of valuation for outside plant, which was the largest factor in saving both time and expense.

—EDITORS.

THE regulation of public utility rates has in most contested cases called for such evidence of physical value of the utility property as appeared to be obtainable only through detailed inventory and valuation. This demand for valuations has come from all three of the parties to regulation, the public, the public utilities and the public utilities commissions. Occasionally sworn statements of utility executives or of disinterested experts have been acceptable, but once a valuation is demanded for rate purposes usually nothing short of minutely detailed inventory and appraisal suffices. Adherence on the part of the commissions, with their quasi-judicial status, to the rules of evidence as laid down by the courts has been a large factor in requiring these elaborate valuations. This, in a measure, has been excusable, considering the ever-present possibility of appeal to the courts from the commissions' decisions.

There is ample basis, however, for questioning the necessity of incurring the expense of making a minutely detailed valuation, and the trend seems to be toward recognition of these negating factors and even in some quarters to concede that proximate methods may result in adequate accuracy. Some of the aspects of recent physical valuations open to criticism are the cost, the length of time to complete, the element of estimate in fixing depreciation and other tangible overhead percentages, the uncertainty as to labor costs in connection with the multiplicity of small items, frequently the inflexibility of the summary as to rational apportionment of the total value among subsequent subdivisions of the property and, more frequently, the insignificance of sizable variations in the physical total as reflected in the rates for the service rendered.

The costs of valuations can hardly be called exorbitant when one observes that for a selection of the recent cases resulting in totals of eight and nine figures the services of the appraisers amounted to from 1.3 per cent to 6.6 per cent of the yearly return (at 6 per cent) on the fair value found. It may be urged that such a small item is negligible among the other constituents of the total needed receipts upon which the rate is fixed, but the same reasoning sanctions the employment of a proximate method of valuation the cost of which is only a fraction of that of a detailed appraisal. It is, however, the public, in its consuming, investing or tax-paying character, which pays the bill, and while only recently laws have gone into effect specifying in great detail how values shall be arrived at, there is evident today a tendency to attach less importance to the strictly physical valuation and more to such factors as the value of the service, or even the mere prevention of an operating deficit.

The time taken to make a physical valuation has often been the cause of long delays in rendering decisions on rate changes, and by the time they are reported conditions in the industry may have undergone abrupt changes, especially during and since the war. Any procedure which will facilitate early decisions is therefore much to be desired.

And again, in actual service the life of a rail bond is not wholly independent of that of the rail nor that of a cross-arm independent of the life of a pole. This feature, in conjunction with the mixture of past experience and future conjecture that establishes the depreciation percentage for each element of property, leads to totals which involve more uncertainty than is ordinarily attributed to a detailed valuation. Another element of uncertainty appears in the labor allowances in connection with the many small items, because, while individually small in themselves, in the aggregate they may result in considerable variations in the total. Incidentally, can any one know to as high a degree of precision the actual labor cost of installing a single trolley bracket as he can the cost of constructing a thousand-foot section of uniform completed bracket construction on wood poles?

Although the tendency has been to regard only the value of the entire connected systems in fixing rates, it is often desirable to be able to demonstrate that local rates are not unreasonable when viewed in the light of the fair value of the corresponding subdivision of the property. Unless precautions are taken the summary of a detailed valuation may not permit ready determination of the physical value for such a subdivision.

And, finally, considerable variations in the physical and fair values are usually possible without in themselves determining the rate. As an illustration, take a million-dollar railway which has an operating revenue of $370,000 and operating expenses of $300,000, with resulting net operating revenue of $70,000. If operating expenses increase one-third, the operating revenues must rise to $470,000 to provide the same net revenue as before. But if the fare originally was 5 cents, under the new conditions 6 cents will not suffice and 7 cents will be necessary. In order that the fair value in itself should be the determining factor for either the 6- or 7-cent fare under the new conditions, the valuation total would have to be as low as $635,000 or as high as $1,685,000 as against the $1,000,000 assumed. Of course these computations imply an undiminished traffic and the application of all net revenue toward interest on capital, but they indicate the extent of variations that are tolerable in the actual case.

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*In two parts.

PURPOSE AND BASIS OF THE VALUATION

The Connecticut General Assembly of 1919 directed the Public Utilities Commission to "investigate the conditions under which the street railways of the state are operated and to report . . . such recommendations and suggestions with respect to legislation as it may deem proper and advisable in order to place such street railways upon a safe and efficient operating basis." But if the Legislature contemplated a valuation it must have been guided by some of the considerations advanced above in favor of an inexpensive tion it must have been guided by some of the commission in following the mandate deemed "it necessary to procure as accurate a valuation of the properties as possible," but added, "we are of the opinion that a reasonably accurate business-like valuation can be made with our existing force and facilities, supplemented by temporary assistance at moderate expense." In this manner the three engineers of the commission, E. I. Rudd, J. P. Wadhams and A. E. Knowlton, were directed to ascertain the cost of reproducing the 750 miles of street railway system under price conditions prevailing from 1910 to 1915. Likewise, the auditor and statistician, Edward Field, was directed to ascertain the actual investment or original cost to date of all the properties.

CONNECTICUT COMPANY'S OWNED AND LEASED PROPERTY

		Appraised Value	
	Way and Structures		
501	Engineering and superintendence	$1,556,182.23	
502	Right of way	722,753.55	
	Work done outside company area	397,200.00	
503	Other land used in electric railway operations	1,485,845.61	
	Land for parks and resorts	605,598.30	
504	Grading	2,071,605.97	
505	Ballast	9,858,741.18	
506	Ties		
507	Rails, rail fastenings and joints		
510	Track and roadway labor		
508	Special work	1,408,709.00	
	Electric switches	16,417.50	
511	Paving	3,696,073.84	
512	Roadway machinery and tools	93,252.69	
515	Bridges, trestles and culverts	1,285,138.25	
516	Crossings, fences and signs	156,173.30	
517	Signals and interlocking apparatus	86,723.06	
518	Telephone and telegraph lines	41,820.28	
519	Poles and fixtures	3,803,717.85	
521	Distribution system		
520	Underground conduits	210,956.18	
522	General office buildings	2,035,084.87	
523	Shops and carhouses		
524	Stations, miscellaneous buildings and structures	143,240.00	
525	Wharves and docks	35,911.00	
526	Park and resort buildings	297,369.56	
	Total way and structures		$30,009,014.22
	Equipment		
530	Passenger and combination cars	4,780,800.00	
531	Freight, mail and express cars	207,533.00	
532	Service equipment	330,230.00	
533	Electric equipment of cars	3,051,329.00	
534	Locomotives	25,000.00	
536	Shop equipment	267,687.75	
537	Furniture	99,233.51	
538	Miscellaneous equipment	62,347.86	
	Total equipment		8,824,161.12
	Power		
539	Power plant buildings	686,820.00	
540	Substation buildings	67,908.00	
541	Dams, canals and pipe lines	90,000.00	
542	Power plant equipment	3,654,000.00	
543	Substation equipment	481,328.00	
544	Transmission system	281,463.41	
	Total power		5,261,519.41
	General and Miscellaneous		
546	Law expenditures	263,676.26	
548	Insurance (injuries and damages)	158,347.88	
547	Interest one year	2,781,297.56	
549	Taxes		
550	Promotion and organization	982,725.12	
	Contingencies	1,838,240.20	
	Working capital	500,000.00	
	General stores and supplies	1,298,744.51	
	Total general and miscellaneous		7,823,031.53
	Grand total		$51,917,726.28
	Land, buildings and equipment not used for electric railway purposes		378,864.52

CONNECTICUT COMPANY'S OWNED AND LEASED PROPERTY

Approved Value by Divisions

Division	Total Computed Single Track, Miles	Total Appraised Value	Average Value per Mile
Stamford	22.571	$991,169.04	$43,913.39
Norwalk	24.144	1,259,463.42	52,164.65
Bridgeport	105.183	7,735,827.44	73,546.37
Derby	27.493	2,025,821.82	73,685.00
New Haven	150.987	12,269,957.62	81,265.00
Meriden	37.981	1,765,165.44	46,474.96
Waterbury	85.063	5 125 073.91	60,250.33
New Britain	33.485	2,050,356.80	61,232.10
Hartford	167.185	10,816,982.33	64,700.67
Middletown	20.470	988,025.09	48 266 98
Torrington	12.676	542,642.21	42,808.63
New London	89.920	4,548,496.65	50,583.82
Working capital, general stores and supplies	....	1,798,744.51	....
All divisions	777.158	$51,917,726.28	$66,804.60

Above figures include under New Haven Division 7.426 miles of West Shore Railway Company property and under Hartford Division 0.814 miles of Manchester Electric Company's trolley property.

It was therefore not only imperative but also in keeping with the philosophy of the commission that the engineers, in ascertaining the reproduction cost of the railways, should devise a method which would entail a minimum of time and expense. At the outset it was recognized that if a detailed inventory were demanded it would be the extended portions of the property that would involve the greatest number of men and consequently the most time and expense. It was in the field work that most of the time and expense could be saved. Familiarity with the properties prompted the idea of treating as much as possible of the "way and structures" account by *applying computed costs of unit sections of an appropriate number of types of outside plant construction.* Some $19,000,000 worth of railway property was valued by this procedure, the portions to which it was applied comprising the following (the numbers are those of the I. C. C. classification):

505-7, 510.	Track and roadway construction.
511.	Paving.
519-521.	Electric line construction, poles and fixtures.
521.	Feeder and distribution system.
544.	Transmission system.
518.	Telephones.
517.	Signals.
507.	Bonding.

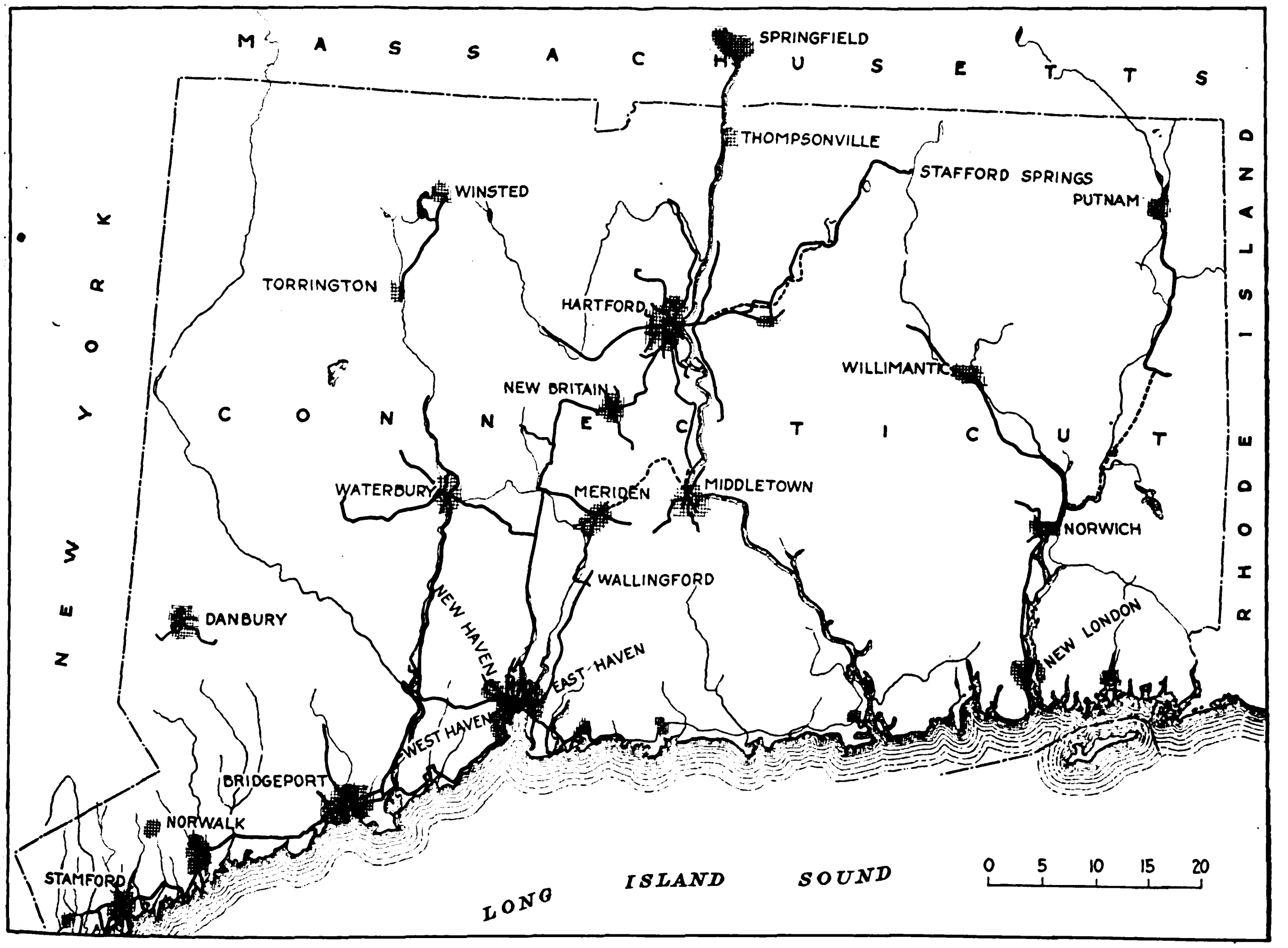
Not only was economy in time and expense attained by this procedure, but it is believed that the results present advantages not always obtainable from the usual type of detailed valuation. The procedure, in a word, amounted to the establishment of "yardsticks" by means of which to measure the assembled construction as contrasted with a detailed count of elementary units without regard to their assembly. Some of the details of the procedure may interest the railway public and a technical discussion of this method will appear in a subsequent article.

PROCEDURE IN VALUATION OF ACCOUNTS TO WHICH UNIT-OF-CONSTRUCTION BASIS WAS NOT APPLICABLE

A map of the Connecticut Company's system, the principal one in the state, is shown herewith, and the total physical values for the various portions of the property are shown in the accompanying table, arranged according to the Interstate Commerce Commission account numbers. Those accounts which were dealt with on a unit-of-construction basis have already been listed and there is given below a brief description of the means and method of assigning values to the remaining accounts.

501. *Engineering and Superintendence.*—The value allowed for this expenditure was obtained by taking 5 per cent of accounts 504-526, 539, 541, 544, 550a, 550b (largely way and structures items excepting land) and, in addition, 1 per cent of accounts 502, 503, 530-538, 542, 543, 550d, 550e (principally land and equipment items).

502. *Right of Way.*—For sections adjacent to railroad right-of-way, New York, New Haven & Hartford Railroad figures per acre as supplied to the Interstate Commerce Commission in its railroad valuation were used. Normal values based on the price paid by a willing buyer to a willing seller were multiplied by a factor, which varied from 1 to 5, to cover severance, damages and other costs of acquisition. Other parcels were valued in part by reference to company records and in part by field estimates of commission engineers or real estate men.



MAP SHOWING CONNECTICUT COMPANY SYSTEM, WHOSE VALUATION IS DESCRIBED IN THIS AND SUBSEQUENT ARTICLES

503. *Park and Resort Lands, Etc.*—The judgment of real estate dealers, tax collectors and valuation records of the New York, New Haven & Hartford Railroad were relied upon for this account (1 per cent of the total).

504. *Grading.*—In order to check the information appearing on the company's records and maps and to supply missing data a few of the interurban lines were cross-sectioned by commission engineers accompanied by company engineers.

508. *Special Trackwork.*—Detailed plans of each installation were available and the costs were computed directly from these plans.

512, 516, 536-538. *Tools, Equipment, Furniture, Etc.*—These accounts comprise roadway machinery and tools; crossings, fences and signs; shop equipment; furniture; miscellaneous equipment. The company supplied the inventory and prices were assigned by commission engineers. These items combined amount to only 0.2 per cent of the physical total for the entire property.

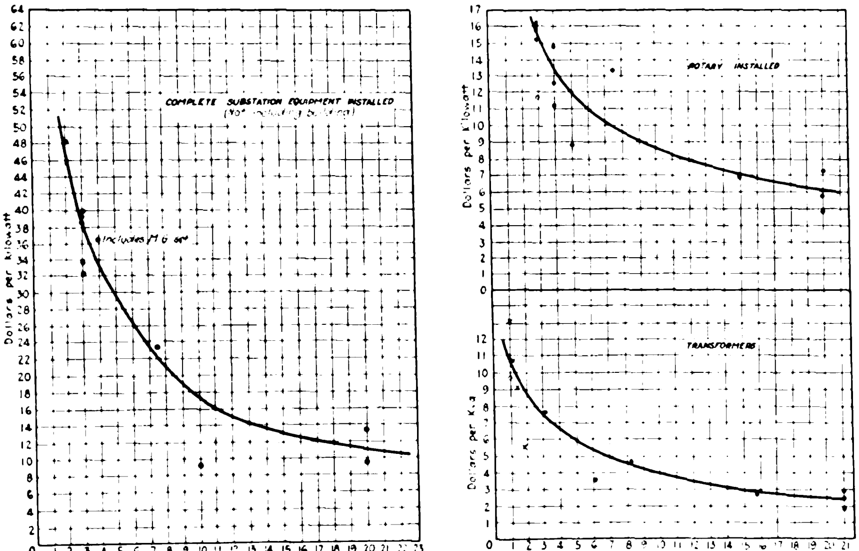
515. *Bridges, Trestles and Culverts.*—Appraised estimates made by outside engineers for the company on the occasion of a regular maintenance survey were supplied by the company to the commission. A field check made by commission engineers at the time of the grading survey indicated a few corrections and additions.

522-526, 539-541. *Buildings and Various Other Structures.*—There are included here general office buildings; shops and carhouses; stations, miscellaneous buildings and structures; park and resort buildings; power and substation buildings; wharves and docks. The company had a record of each of these items covering size and character of construction. With a view to classification each of these structures was visited to ascertain its physical condition and the manner of use. The prices applied were on a cubic content and area basis similar to those employed by the I. C. C.

530-534. *Rolling Stock.*—Cars (passenger, combination, freight, mail, express, and service) with their electric equipment, and locomotives were examined to determine the type of body, of trucks and of electric equipment. Unit prices were then applied separately to each of these three components of each car. Cars manifestly in need of extensive repairs to permit shifting from part-time to full-time service were averaged at 80 per cent of reproduction value. No value was included for abandoned equipment.

542, 543. *Power and Substation Equipment.*—Lists of all the equipment were supplied by the company and these in conjunction with personal inspection enabled two consulting engineers, one electrical and one mechanical, both of wide experience in the field of steam-electric power, to report over-all values for the equipment in each plant. The commission felt that the candid opinion of these engineers on the lump reproduction value of the plants would be as valuable and reliable as would be the summarized result of a more detailed study unit by unit. Due to relatively recent construction, it was found easily possible to ascertain the equipment costs for the substation in considerable detail. The variation in installed cost of substation equipment per kilovolt-ampere with the capacity of the substation is exhibited in the accompanying curves as an interesting result of this study.

546. *Law Expenditures.* One per cent of the total amount of accounts 504-526-539, 541 and 544 was allowed for this item. It will be noticed that this includes all physical items except land, rolling stock, furniture and equipment of power plants and substations.



CURVES SHOWING SUBSTATION COSTS AS RELATED TO CAPACITY

547, 549. *Interest and Taxes.*—In carrying out the instructions of the commission to ascertain the reproduction cost based on prices prevailing during the period 1910-1915, the engineers estimated that the system would be established in five approximately equal sections, each requiring one year to construct. On this basis an allowance was made for interest and taxes of 6 per cent for one year on accounts 501-546, 548, 550a-550e.

548. *Insurance* (Injuries and Damages).—Employers' and public liability insurance premiums (based on payroll) amount to the following percentages of the total of each account when applied to the probable labor component of that account and these were then allowed for the insurance item:

2.4 per cent of (517-521, 544).
0.3 per cent of (530-534).
0.7 per cent of (536-538, 542, 543).

550. *Promotion and Organization.*—Two per cent of accounts 501-549, 500a-550e was the allowance for this capitalized expenditure. General stores and supplies as inventoried by the company and priced jointly by the company and commission engineers amounted to some 2.5 per cent of the physical total.

Analysis will show that the total of the tangible overhead allowances amounts to 22.2 per cent of the total of physical items appearing in accounts 502-544. If general stores and supplies and working capital are deducted the remaining overhead items represent about 18.2 per cent of the physical total.

HISTORICAL COST

The statistician and auditor made a very careful study of the corporate and accounting history of the company and arrived at the totals in the table below.

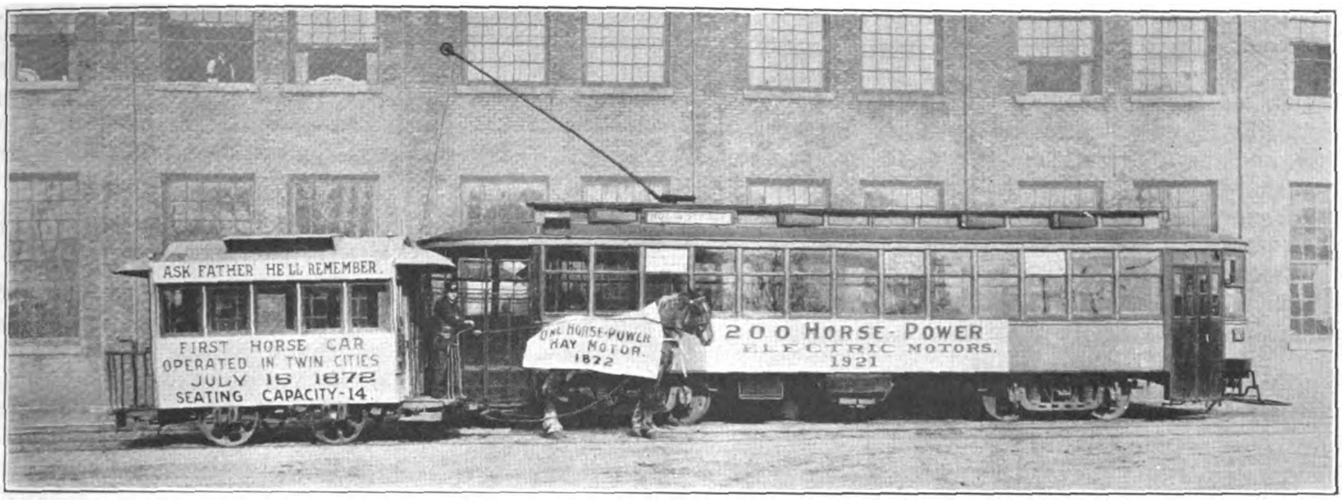
A corresponding total of $19,741,537.14 was found to be the historical cost of the lines leased by the company, making the total historical cost of the company's owned and leased lines $60,753,352.85.

Much of the difference of $9,000,000 between the reproduction cost and historical cost is accounted for when it is recollected that many of the component lines started as horse railways, and the capital invested in horses, rolling stock, light rails and roadbed construction, none of which is in existence today, is included in those costs, as well as the cost of the modern tracks, pavement and equipment, built and paid for with new and additional capital.

The foregoing shows in a general way the sources of and the bases for the values assigned to that portion of a street railway property which, for contrast, may be called "inside plant." While no claim is made that all the figures are rigidly exact, it is felt that they surely are entitled to be classed as proximate in their character rather than merely approximate. Or from another angle, such errors, omissions or duplications as may have crept in in this instance, as is nearly always the case, were well within the limits imposed at the start and, in the opinion of the writer based on the arguments advanced, are tolerable in all ordinary utility valuations. A later article will exhibit in considerable detail the method of attack for the "outside plant."

FINAL TABLE SHOWING HISTORICAL COST OF THE PROPERTY OF THE CONNECTICUT COMPANY

Expenditures for road and equipment on owned lines (8/1/1906 to 12/31/1919)	$16,032,996.00
Expenditures for road and equipment on leased lines (1906–1919)	5,159,503.61
Total expenditures on owned lines and leased lines	$21,192,499.61
Cost of construction and equipment of the several street railway lines purchased by predecessors of the present company, as shown by the last report of such street railway companies to the Railroad Commissioners	19,819,316.10
Total historical cost of street railway properties of the Connecticut Company, at Dec. 31, 1919	$41,011,815.71


ASK FATHER HE'LL REMEMBER
FIRST HORSE CAR OPERATED IN TWIN CITIES JULY 15 1872 SEATING CAPACITY-14
ONE HORSE-POWER HAY MOTOR 1872
200 HORSE-POWER ELECTRIC MOTORS 1921

TWO FEATURES IN TWIN CITY'S DEMONSTRATION

Railways Find Real Publicity Pays

Demonstrations on National Electric Railway Day Catch Public Eye for Unusual Sights —Editorial Nose for News that's Different—Makes Folks in the Industry Realize the Importance of Their Jobs—Interest of Public Further Aroused by Competition for Prizes for Essays and Free Passes

THE electric railway industry on May 4—National Electric Railway Day—proved itself the "Babe Ruth" of the public utility league. It knocked the advertising and publicity ball far out over the clubhouse. May 4 was proclaimed National Electric Railway Day by the committee on publicity of the American Electric Railway Association and notices to this effect were sent out to the membership on April 16 over the signature of P. H. Gadsden, president.

> It was well to give a public demonstration of the anniversary of the trolley, for it brought vividly to public mind the great advance that has been made in transportation. People are prone to live intensely in the present and to forget or to ignore progress that has been achieved.
>
> —*Washington (D.C.) Star*

The celebration was without doubt a success. In virtually every city in the United States where an electric car is run the increased efficiency of local transportation service and the great importance of local electric railway systems were driven home to the public. This was accomplished by parades showing the contrast between either the horse cars of a third of a century ago or the earlier types of trolley cars and present up-to-date $15,000 cars, newspaper stories, display advertising and other publicity.

Reports received by the Advertising Section of the association, which suggested details of the program to companies under the direction of the publicity committee, indicate that more than a score of companies staged some form of demonstration in different parts of the country.

Practically every daily newspaper in the country carried either a local or a telegraph story about national observance of the day. These stories not only told the history of the electric railways but also discussed the present problems of the industry. Two press associations put out national stories to 2,000 daily newspapers which were prepared on facts furnished them by the Advertising Section. Local companies co-operating with their home papers supplied further information that led to a large number of feature stories of community importance. Clippings so far received by the association show that the stories ranged from 300 words to a page and a half. Most of them were liberally illustrated with pictures of former and present types of cars. Many newspapers also commented editorially on the observance of the day and the growth and importance of electric railways to the welfare and development of urban centers.

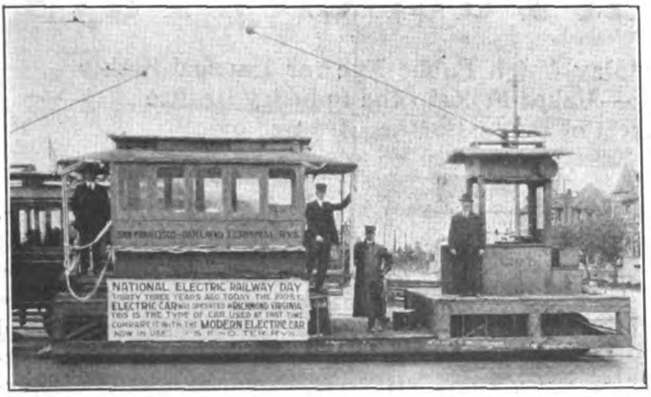
The largest news motion picture organizations of the country took motion pictures of several of the celebrations. Advices from A. H. Herrmann, Virginia Railway & Power Company, say that several motion picture operators were present at the Richmond celebration and took pictures of the parade despite the inclement weather. These pictures were shown later in motion picture houses throughout the country.

Many local companies supplemented the newspaper stories with display advertisements. The Northern Ohio Traction & Light Company and the Virginia Railway & Power Company issued special editions of their own publications, the latter being distributed broadcast to car riders. The Advertising Section also provided special cards for window display and other leaflets.

Three companies, namely, those operating in East St. Louis, Ill.; Charleston, S. C., and Pottsville, Pa., offered money prizes for the best essay or historical review of the development of the local system. In Pottsville the prize offer was limited to the school children and the interest taken is reflected in the illustration shown.

Among the companies that have reported street demonstrations are: Union Street Railway, New Bedford, Mass; Virginia Railway & Power Company, Richmond, Va.; Twin City Rapid Transit Company, Minneapolis and St. Paul, Minn.; Indianapolis (Ind.) Street Railway, Eastern Pennsylvania Railways, Pottsville, Pa.; Rockford (Ill.) & Interurban Railway and the San Francisco-Oakland (Cal.) Terminal Railways. Several companies, including New Orleans and St. Louis, have reported that they intend to stage demonstrations later.

Some difficulty was found in several places in resurrecting old rolling stock that would show the desired contrast between present and former day service and therefore such companies could not put on a parade, but contented themselves with display advertising and newspaper publicity.


SAN FRANCISCO-OAKLAND TERMINAL RYS
NATIONAL ELECTRIC RAILWAY DAY
THIRTY THREE YEARS AGO TODAY THE FIRST
ELECTRIC CAR WAS OPERATED AT RICHMOND VIRGINIA
THIS IS THE TYPE OF CAR USED AT THAT TIME
COMPARE IT WITH THE MODERN ELECTRIC CAR
NOW IN USE S. F.-O. TER. RYS.

ONE OF THE FEATURES SHOWN IN OAKLAND, CAL.

A letter from Mr. Herrmann regarding the Richmond celebration said in part:

"Despite the cold, rainy day we paraded three cars throughout the city in the afternoon, the front one being the oldest type summer car we could find; in fact, it was the only car of the kind we could secure, and it was quite antique looking, being the first summer car operated on the Richmond lines. The car was signed on the sides as you will note in the illustration and it carried a brass band. The next car was one of the big center-entrance type and then followed a modern safety car, these two carrying the Mayor, City Councilmen and officials of the company. The parade started from Twenty-ninth and P Streets, which was the terminal from which the first electric railway operated.

"Film representatives from Washington came down, arriving just a few minutes before the parade, and they got pictures from several sections of the city.

"Everything worked out very well and I do not believe we could have made a better demonstration if we had had a month's time. In fact, I believe the speed under which every one worked had a stimulating effect."

The celebration in Minneapolis and St. Paul attracted widespread attention, the newspapers giving it publicity prior to and on Electric Railway Day. In Minneapolis Henry Green, a former driver but now in the legal department, again took hold of the reins of the car. After a trip through the down-town section of the city the car was taken to St. Paul, and there John Prior, the oldest street car conductor, was the driver. The car was preceded by the trainmen's band in both cities. The fourteen persons making application to ride in the car were given seats of honor.

CONTEST BETWEEN OLD-TIMERS AROUSED KEEN INTEREST IN NEW BEDFORD, MASS.

New Bedford, Mass., had a tremendously successful celebration. Immediately after the celebration of the day was suggested, the Union Street Railway began preparations for the event and succeeded in arousing great interest. One of the most successful features of the program was the offer of a year's free transportation over the local lines to the oldest man who rode on the horse car during the parade. A heated contest between old residents ensued and the prize finally was won by Edwin B. Macy, 88 years old. The reins were handled by James Card, one of the oldest former employees of the company. Peter Duprey, another old driver, also was on the platform. A clipping from the New Bedford *Times* says that between ten and fifteen thousand persons witnessed the demonstration. Not only the New Bedford but also some of the Boston papers devoted liberal space to a review of the celebration.

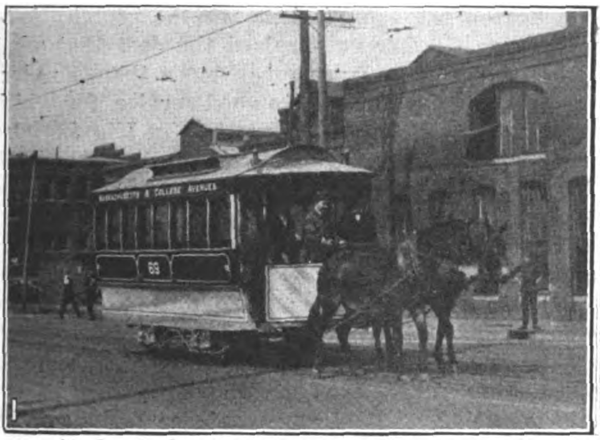
The Pottsville, Pa., celebration also attracted much newspaper publicity. The Pottsville *Republican*, which in the early days led the fight for electric railways in that territory, devoted more than a page to the story. C. A. Hall, general manager Eastern Pennsylvania Railways, and his assistants worked energetically in bringing about a successful observance of the day and they were well repaid for their efforts. Unfortunately, it was impossible on account of rain to keep the old time car out as long as seemed desirable on May 4, so it was brought out again later in the week.

In Indianapolis Robert I. Todd, president Indianapolis Street Railway, quietly slipped one over on the folks by springing his show on the unsuspecting public at about 5 o'clock in the evening. An old-time horse car drawn by two mules followed by a modern electric car started from the Traction Terminal Station and ran through the principal streets of the town. In describing the trip Mary E. Bostwick, a staff writer of the Indianapolis *Star*, says that "all the traffic rules in the world were broken by the mules and that a cop almost arrested the party." Besides Mr. Todd, Joseph A. McGowan, secretary and treasurer of the company; James P. Tretton, superintendent; James F. Lynch, J. E. Sweeney and Edward Noon rode on the car.

In Rockford, Ill., Gus King, who drove a mule car in the olden days, was in charge of the resurrected hay-burner. For a brief half hour the mule enjoyed prominence, being the cynosure of all eyes on the principal streets. But, as is often the fate of heroes, he suffered a fall and in one short half hour after the demonstration he again was dragging a prosaic coal wagon through the back streets of the town.

The East St. Louis & Suburban Railway co-operated very successfully in the observance of the day. Exhibits received show that single and double-page advertisements calling attention to the day and its significance were carried in various local papers prior to and on the day of the celebration. Dashboard signs were also displayed on the cars May 3 and 4. Sleeve bands, as illustrated, were worn by officials, office employees and car crews on May 4. The advertisements were particularly well executed. One of them contained articles by prominent citizens regarding the growth of the local traction system. One striking feature of this same advertisement was the announcement of the "Funeral of the Dinkies" displayed within inverted rules, as well as interesting illustrations of old time and modern cars.

In Oakland, Cal., a single-truck car of early vintage was mounted on a flat car. The flat then toured the city and caused much comment on past means of transportation.



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ANNIVERSARY
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ELECTRIC
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DAY
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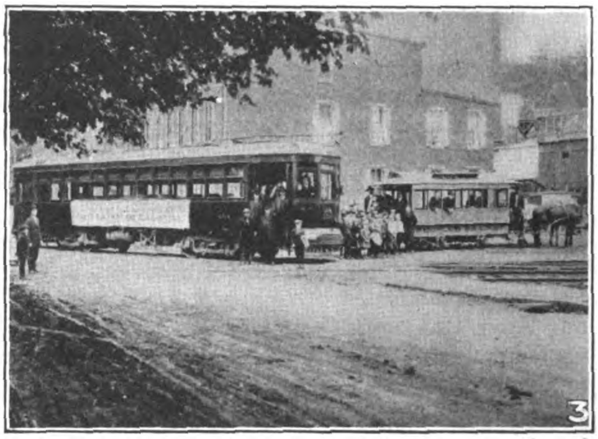

AMERICAN
ELECTRIC
RAILWAY
DAY
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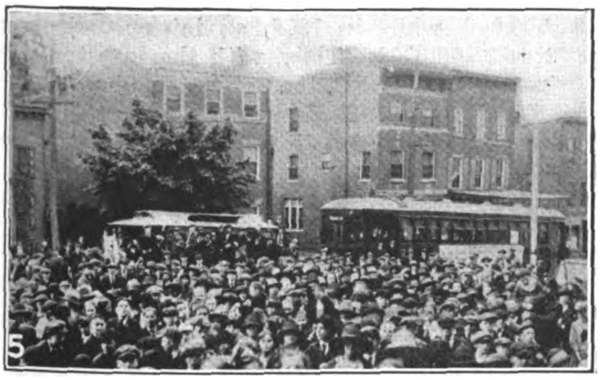


ONE OF RICHMOND'S FIRST CARS
MAY 4 1888
6

ALL SECTIONS OF THE COUNTRY PARTICIPATED IN THE CELEBRATION OF NATIONAL ELECTRIC RAILWAY DAY

1—President Todd of Indianapolis at the reins.
2—Badge worn by the employees of the Little Rock Railway & Light Company.
3—First and last types of cars at Pottsville, Pa.
4—Arm band worn by train crews, officials and office employees of the East St. Louis & Suburban Railway.
5—School children of Pottsville participating in demonstration.
6—Earliest type of cross-bench open car operated in Richmond.

Advices have been received from companies showing that much attention was paid to the day by the newspapers and the public in more than 125 other cities. Among those more than a score need special mention, namely, Bangor, Me.; Charlotte, N. C.; Cincinnati, Ohio; Duluth, Minn.; Elmira, N. Y.; El Paso, Tex.; Evansville, Ind.; Framingham, Mass.; Green Bay, Wis.; Haverhill, Mass.; Jackson, Mich.; Little Rock, Ark.; Los Angeles, Cal.; Lynchburg, Va.; New Orleans, La.; Oil City, Pa.; Pine Bluff, Ark.; Peoria, Ill.; Savannah, Ga.; Seattle, Wash.; St. Joseph, Mo., and Sheridan, Wyo. In these places either well-illustrated special advertisements or signed staff stories or both were features.

The personnel of the publicity committee, under whose direction National Electric Railway Day was celebrated, is:

Barron G. Collier, New York, chairman; S. W. Huff, New York; B. I. Budd, Chicago; C. B. Buchanan, Richmond, Va.; W. A. Draper, Cincinnati; C. D. Emmons, Baltimore; L. S. Storrs, New Haven, and Horace Lowry, Minneapolis. The details of the program were carried out by Labert St. Clair, head of the association's advertising section.

The committee has great reason to be pleased with the results of the day. It demonstrated the possibilities of nationally advertising electric railways through the co-operation of local companies with the association's Advertising Section.

Large Meeting in Hartford

Joint Session of New England Street Railway Club and Connecticut Company Section No. 7, A. E. R. A., Proves Most Successful

PERFECT weather for the inspection and sightseeing trips added the finishing touch to the success of the joint meeting of the New England Street Railway Club and Connecticut Company Section No. 7, American Electric Railway Association, at Hartford on Wednesday, May 18. More than 250 members of the two organizations spent the day at Hartford and attended the sessions which started at noon and stopped at 10 o'clock at night. While suggestions for holding such a joint session have been made many times in the past, it was not realized until this week.

The meeting started with a luncheon at the Wethersfield carhouse of the Hartford Division of the Connecticut Company, which was followed by the showing of the moving picture reel taken at the New England Street Railway Club outing in Montreal last summer. After this E. Irvine Rudd, chief engineer of the Public Utilities Commission of Connecticut, presented a paper on "Appraisals and Their Uses." After discussing the various purposes of appraisals and showing the progress of engineering valuation, Mr. Rudd discussed the recent valuation which the commission has made of the railways in Connecticut. In this discussion he presented an analysis covering much the same ground that is included in the articles by his associate, A. E. Knowlton, the commission's electrical engineer, in this and subsequent issues of the ELECTRIC RAILWAY JOURNAL.

The rest of the afternoon was spent in visits to the Connecticut Company's shops and carhouses in Hartford, in inspecting the power plant of the Hartford Electric Light & Power Company, now in construction, and in sightseeing trips around Hartford by special car and by auto.

At 6:30 dinner was served to the entire attendance at the Hartford Club. Following this dinner a succession of chairmen took charge of the meeting, in the following order: V. S. Curtis, vice-president of Connecticut Company Section No. 7; N. J. Scott, newly appointed manager of the Hartford Division of the Connecticut Company; Edward Dana, president of the New England Street Railway Club, and W. J. Flickinger, vice-president for Connecticut of the New England Street Railway Club. During these successive chairmanships, resolutions were adopted on the death of Warren P. Bristol, late manager of the Hartford Division, and 66 new members were admitted to the New England Street Railway Club.

With Mr. Flickinger presiding, the program of the evening was then commenced. The principal speaker was Richard T. Higgins, chairman of the Public Utilities Commission of Connecticut, the keynote of whose address was to urge co-operation of the rank and file of street railway employees to their executives and to the company in providing good service to the public. Mr. Higgins said that originally it was electric railways themselves which sought franchises and thereby established themselves so that it was therefore up to the companies primarily to furnish service and overcome the obstacles of street railway operation. Their efforts, however, must be coupled with the co-operation of the public, but no amount of sympathy or co-operation by the public will overcome any lack of co-operation on the part of the company. Railway men, particularly executives, are public servants, but no amount of ability of executive officers is any good without the co-operation of the men. Any one voluntarily entering public utility service takes on the obligations of a public servant.

Mr. Higgins also pointed out that the Public Utilities Commissions are necessarily influenced, whether rightly or wrongly, by public opinion, and it is therefore of vital importance that it be by an enlightened public opinion. From this it is necessarily concluded that the company should make every effort to enlighten the public, for naturally the public wants to be fair, and if it has full information its opinions and therefore its influence on the commissions will be sound.

Mr. Higgins further emphasized the fact that what the public wanted is service much more than a reduction in fares. The public wants good service, for which it, in his belief, is willing to pay. Mr. Higgins also talked on the practical business-like valuation which Mr. Rudd had discussed in the afternoon, and also on the new problems of the Public Utilities Commission in Connecticut due to the placing of jitneys under its control in that state. He said that the Connecticut law now made it obligatory to determine if public convenience and necessity require jitney service, and, while this brought up many problems which he could not discuss and decide now, he did want to point out that the question of public convenience and necessity is very largely the result or function of the feelings of the public, based, however, on fact.

Following an entertaining Roscoe Arbuckle movie, Mr. Storrs, president of the Connecticut Company, gave the final address of the evening, in which he emphasized the almost revolutionary changes which have taken place in electric railway operation in the last four years. He gave some interesting figures for Connecticut, and pointed out that in 1900 the gross revenue of Connecticut railways was $3,271,000, the operating expenses $2,016,000, while in 1919, with a gross revenue of $12.875,000, the operating expenses were $11,200,000. This left a net in 1900 of $1,080,000 and in 1919 less than $1,000,000, while in 1916, an intermediate year, the net was $3,066,000. Thus, with the investment in Connecticut almost trebled, the net revenue has actually decreased, and while 1920 figures are not available in detail, he predicts a deficit for the state of about $1,000,000.

However, he pointed out that the railways have gone through four years of stress and strain to the advantage of all. New methods of doing everything have been evolved, and these years have also helped to encourage co-operation and to promote better ideas of railway publicity and information.

Lay Single Tracks Off Center

IN CONNECTION with some repaving being done by the city, the Chattanooga Railway & Light Company recently reconstructed some of the single-track lines in the city, and in doing so placed the single track where one of the two tracks would be in case it were a double-track section of line. This was done because it was felt that development in the near future might make it advisable to double track these sections of the system and that considerable expense would be saved if the one track which had to be laid now were placed so that it would form one of the double tracks in the future without the necessity of doing anything to it at the time the system or section was double-tracked.

Fares and Short-Haul Traffic

THROUGH an error in the printing office last week the concluding lines of an article appearing in that issue on "Fares and Short-Haul Traffic," by Edward A. Roberts, engineer with John A. Beeler, New York, was omitted. The greater part of this article appears on pages 896 and 897 of last week's issue. The concluding two paragraphs, including the omitted portions, are as follows:

"The placing of a definite value on the average car rider's time is not at all a simple task, and one person's estimate is about as good as another's. A person's earning ability should, however, not be confused with the amount of time the same person would feel justified in using in order to avoid spending 5 cents. The average figure of 50 cents an hour seems high, although it would apply to those who are actually being paid for their time by an employer or to those who are hurrying to specific engagements. Under this classification are such people as salesmen, bill collectors, business men and plumbers. The figure of 25 cents an hour fits more closely the estimate that the average person uses in deciding whether to ride or walk. The average woman who keeps house and shops during the middle of the day bases the worth of a street car ride on some such amount as this. The same applies to the vast majority of people going to and from work. It is doubtful if the leisure time of even the well-paid classes should be considered at more than 25 cents an hour.

"The method of analysis outlined in this article is not intended to point out a definite answer to the fare question or to say what fare will yield the most total revenue in a specific case, but it is believed that its use will in many instances shed additional light on some phases of one of the industry's most serious problems."

Discussion of the National Electrical Safety Code

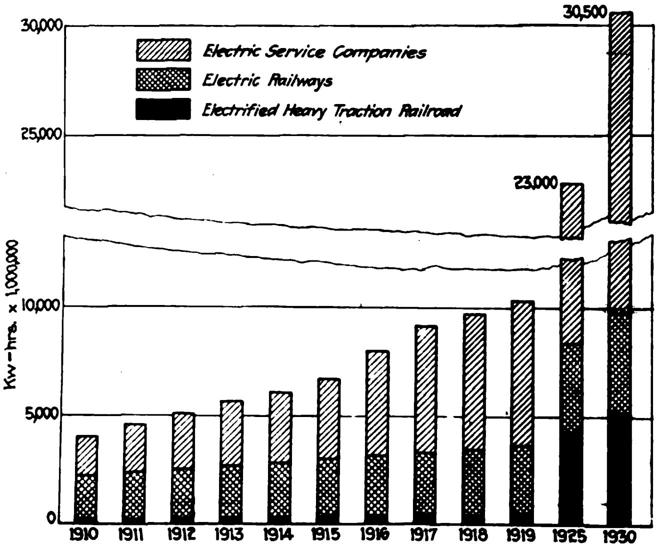
THE Bureau of Standards has just issued Handbook No. 4 on the National Electrical Safety Code, containing a revised discussion of the rules and forming a companion volume to Handbook No. 3, which contains the revised edition of the rules themselves. The discussion of the rules has been considerably amplified. Many items and suggestions have been included which are not involved in the rules themselves but have bearing upon good practice and matters immediately related to the subject of the rules. In addition, the endeavor has been made to make the meaning and interpretation of the rules entirely evident and to give in many cases the reasons which have prompted inclusion of particular rules in the Electrical Safety Code. Illustrations have been provided to show the intent and application of a number of rules.

The discussion of the rules follows the order of the rules themselves and is segregated into the four parts dealing respectively with stations and substations, overhead and underground lines, utilization apparatus, and operation of utility stations and lines. There is also a supplementary section dealing with the subject of grounding. The introduction to the discussion includes the results of a survey of pole lines made jointly with the committee on safety rules of the National Electric Light Association and conducted in the summer of 1919.

Meeting of the Superpower Committee

AT A MEETING in New York on May 13 of the Advisory Board of the Superpower Survey a number of interesting facts were brought out. It is expected that the final report will be finished on June 30.

In making the survey 315 utilities were examined, representing a capacity of 4,000,260 kw., of which 11 per cent was hydraulic and 89 per cent steam. The output of these stations was 10,301,000,000 kw.-hr., hydraulic stations producing 16 per cent of this output and steam stations 84 per cent. The steam stations consumed 11,806,000 tons of coal at a cost of $63,228,000. The average coal rate was 2.73 lb. per kilowatt-hour. Although the maximum capacity of any steam plant in the territory was 163,000 kw. and that of any hydraulic plant was 83,500 kw., the average of all steam plants was found to be 10,000 kw., while the average of hydraulic plants was 2,700. An investment of $598,000,000 is represented by these plants, 85 per cent of the total being for steam plants and 15 for the hydraulic. Probably 25 per cent of the power requirements can be supplied by hydro-electric development. Standardization of 60 cycles as a uniform frequency was recommended.



PAST AND ESTIMATED FUTURE GROWTH OF ENERGY CONSUMPTION IN THE SUPERPOWER ZONE

W. S. Barstow presented an outline of a financial plan for the system. Under this plan a superpower company would be formed, having only one class of securities, *i.e.*, non-par value stock, and all existing public service companies in the territory, as they became customers of the superpower company, would be entitled to subscribe to this non-par stock of the company pro rata, based on demand and load factor or on some other predetermined definite basis. In case any public service company does not become a stockholder in the superpower company the stock to which it is entitled to subscribe can be offered for sale to the investing public.

After the presentation of this plan there was a discussion on the relative merits of a federal or state charter for the proposed company, but no definite decision as to a recommendation was reached. The accompanying chart shows the past and estimated future growth of energy consumption in the proposed superpower zone.

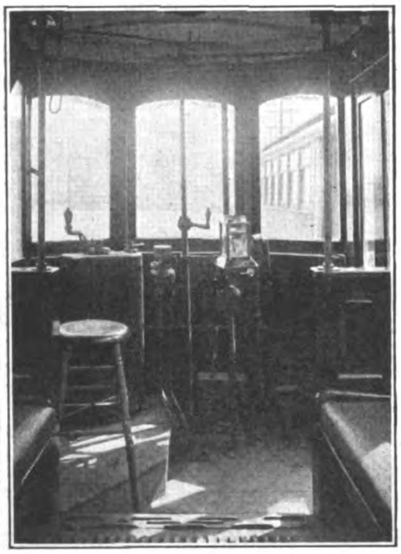
Equipment and Its Maintenance

Short Descriptions of Tools Used Together with Mechanical and Electrical Practices of All Departments to Supplement the Preceding Longer Articles

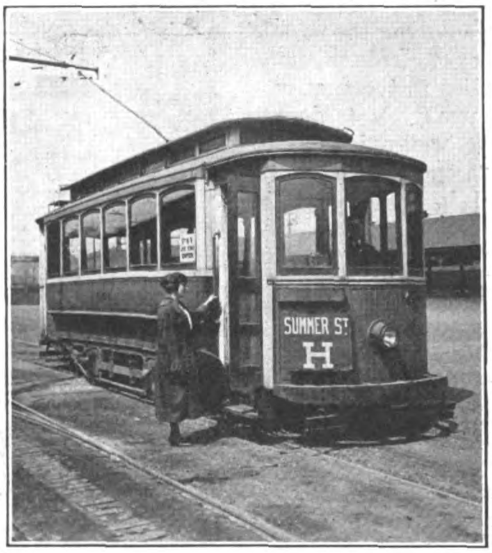
Connecticut Company Remodels Cars for One-Man Operation

Platforms Were Reconstructed, Air Brakes Installed and All the Usual Safety Devices Were Added to Make the Car Suitable for One-Man Operation

THE Connecticut Company has remodeled forty-three single-truck closed cars and added additional equipment necessary to use them for one-man operation. The actual work of remodeling was done in several of the company's shops, and where new parts were constructed or others changed this was done in the reclamation shop at New Haven. In reconstructing these cars the center portions of the bulkheads were removed at each end, but the upper and lower end panels were retained. Two short stanchions were installed between the upper and lower end panels on each side to give the necessary support.



PLATFORM EQUIPMENT GROUPED TO PROVIDE MAXIMUM SPACE



ONE OF THE REMODELED CARS IN SERVICE IN STAMFORD, CONN.

CENTER ROW LIGHTING ARRANGEMENT WITH SHADES

The location of the platform equipment was changed and additional equipment was added in a location so as to provide as much space as possible for the entrance and exit of passengers. The K-10 controllers were moved to the extreme left and mounted on a raised platform used by the motorman. Between the controller and the door additional apparatus was installed consisting of the motorman's air brake valve, an upright stanchion with handle for operating the doors, the hand-sanding lever and an additional upright stanchion for holding the Johnson fare box. The hand brake staff was retained in its original location, but a drop handle was installed to afford more platform space.

While the original K-10 controllers have been retained, additional equipment has been added as required to provide the safety features for one-man operation. A type of dead man's handle, as shown in one of the accompanying illustrations, was designed by the engineers of the company, and the work of making the changes necessary in the handle was done in the reclamation shop in New Haven. By pressing down the button in the handle a lever engages a cam installed under the handle around the shaft in a location to replace the controller water cap. With the button depressed the cam is thus turned against the pressure of a coil spring inside the cam. The movement of this cam operates another small lever at the back of the controller, which in turn operates a push-button switch to close the circuit for the auxiliary line switch. Whenever the button in the handle is released the cam returns to its "off" position by the action of the spring and the operating circuit is opened by the line switch. The line switches used consist of the General Electric Company's SB-61-11 Auxiliary Form A contactors. Three Westinghouse H-350 push button switches were added at each end of the car. One of these push-button switches is located so that the opening of the door cuts off power and provides so that power cannot again be restored until the doors close. One of these, as just described, operates in conjunction with the handle on the controller to provide the dead man's device so that power will be shut off as soon as the operator releases the handle. The third switch is used as a foot switch so that operation can be continued without the necessity of holding down the dead man portion of the handle. These cars were originally equipped with two hood switches. One of these was removed and one is still retained as a switch for opening the circuit in case of emergency and as a switch ahead of the control equipment.

The remodeled cars were equipped with straight air brakes and the equipment used was taken from obsolete cars and open cars which were not being used. Old governors, engineer's valves, main reservoirs, brake cylinders and compressors were thus used. The compressors were some which were taken from the Birney type of one-man cars which the company has in operation. These were the General Electric CP-25 and Westinghouse DH-10 type, which were found of too small capacity for the Birney cars, which are equipped with pneumatic door engines, and they were used on these reconstructed cars, as the amount of air required is less than that which is used on the standard Birney car.

The brake cylinder is installed underneath one of the platforms and is connected to the brake rigging as originally installed for hand-brake operation. The same type of hand-operated sanders are used, but a new sanding lever was installed to make its operation more convenient for the motorman. These cars were provided with fixed steps, and two of these were retained without change. At the two entrances which were not used the doors were screwed shut and the steps were removed. At the entrances retained new folding doors were installed, arranged to open outward. The doors are hand-operated from a convenient location for the operator.

The lighting arrangement of the old cars consisted of two three-light clusters and one two-light cluster inside the car with additional lights on the platform and in the headlight to make a total of two five-light circuits. Some of the cars had poor headlining and it was decided to replace this, and at the same time a new lighting arrangement was provided, which consists of a row of five lamps down the center of the car, the additional lamps for the platform and headlight making a total of ten lights arranged in two circuits. The platform light is installed over the top of the door to provide illumination for the steps when the doors are open.

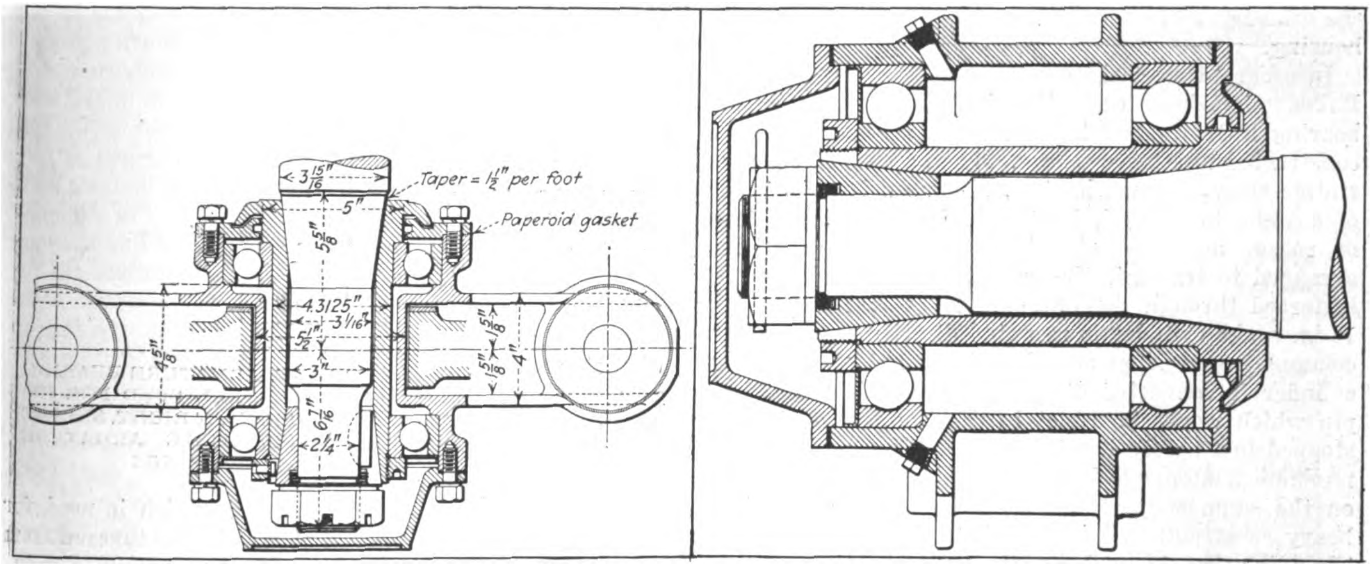
Originally these cars had two lights for each dash sign. One of these lights was used for the light over the door, the other being retained in its original position. The original trucks of the cars were retained, these consisting of Brill type 21-E, and the motors used are G.E. 67. These cars seat twenty-four and twenty-six passengers and are provided with longitudinal seats.

New Ball Bearing Journal Boxes

Journal Box Designed for Brill No. 79-E Truck and Interchangeable with Plain Sleeve Journal Box Developed Which Has Many Improvements Over Old Type

THE principal objection to the ball bearing journal boxes which have been tried out on electric cars during the past few years is the tedious and careful handling necessary in removing and assembling the boxes whenever it is necessary to replace wheels. After the journal boxes have been removed and replaced several times the bearings become loose on the axle and so cannot safely sustain the heavy shock loads imposed upon them for any length of time.

In an endeavor to overcome this objection the Gurney Ball Bearing Company has just brought out a new design, which is illustrated herewith. This type of journal box was designed primarily for the Brill No. 79-E truck and is interchangeable with the plain sleeve journal box now used, with the exception of the axle ends. As the ball bearings are of the angular contact type, mounted opposed to each other, they can be adjusted. The engineers of the Gurney company have found adjustments quite necessary, as no matter how efficiently the dirt seals are designed or how much attention is given to the lubrication of the bearings some will become loose, and this play must be taken up by means of the threaded nut at the outer end of the sleeve, if a long life of the ball bearings is expected.



BALL BEARING JOURNAL BOX DESIGN FOR SAFETY CARS

In the new design the sleeve on which the bearings are mounted protrudes through the journal box inner cover and the cup flanged end acts as a dirt slinger. The sleeve is held in place by the tapered spring adapter sleeve and threaded nuts on the axle end, and as it is supported by the axle on the taper bored ends, the bearing loads are thus transmitted. A Woodruff key inserted into the slot of the adapter prevents any torsional pressure being transmitted onto the axle end nut. This relieves the cotter pin which holds the nut in place from any strain. Should the tapered spring adapter sleeve be clamped solidly between the bearing sleeve and the axle, for removing the journal box from the axle, a tapped hole for the insertion of a special tool to remove this sleeve is provided.

The whole journal box is handled as one complete unit and can very easily be assembled or removed from the axle to replace wheels or gears. The ball bearings are also not exposed and practically no foreign matter can get into the journal box even if the outside cover is taken off to remove the locking device which fastens the ball bearings to the axle.

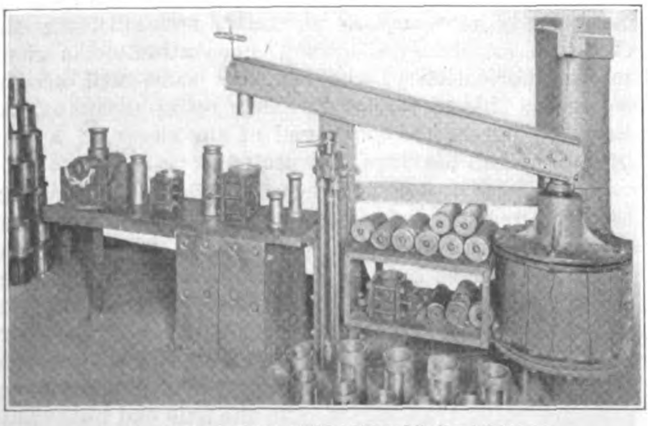
Expanding Railway Motor Bearings

To Provide a Tight Fit of Bearings in Their Housings, the Practice of the Third Avenue Railway Is to Expand Worn Bearings Slightly by Means of an Air-Operated Mechanism

By H. J. Krombach
General Foreman Third Avenue Railway, New York City

The problem of taking up the wear that occurs between the outside of bearings and their housings in railway motors has bothered many master mechanics. Probably the method most universally employed is to insert shims between the bearing liner and the housing so as to provide a tight fit. If this wear is not taken up in some manner after it has once started it increases very rapidly and ultimately leads to the scrapping of the bearing and either the reboring or rebushing of the housing.

In order to meet these conditions the Third Avenue Railway has been expanding both armature and axle bearing liners by making use of an air-operated press constructed in its own shops. The accompanying illustration shows this mechanism, which consists essentially of a 16-in. brake cylinder to which is attached a lever or rocker arm, the opposite end of this arm being arranged to transmit the pressure to a mandrel which is forced through the bearings to expand them. The 16-in. brake cylinder is mounted directly on one of the columns in the shop and the piston rod of this brake cylinder is connected directly to the rocker arm by a pin which works in a slot in the arm. The piston is stopped just before it reaches its extreme position by a mechanical stop which is installed above the cylinder on the same supporting post. The rocker arm is of heavy construction, being made of two 6-in. channels. The distance from the piston-rod connection to the fulcrum is 38 in. and from the fulcrum to the point where pressure is applied to the mandrel is 19 in., so that a ratio of 2 to 1 is obtained. An air pressure of from 80 to 90 lb. is used for operating the mechanism. With an air pressure of 85 lb., 17,090 lb. is obtained on the brake-cylinder push rod and twice this amount, or 34,180 lb., is applied to the mandrel for expanding the bearings. The air for operating the cylinder push rod is controlled by an ordinary straight-air brake valve, such as is used on electric cars.

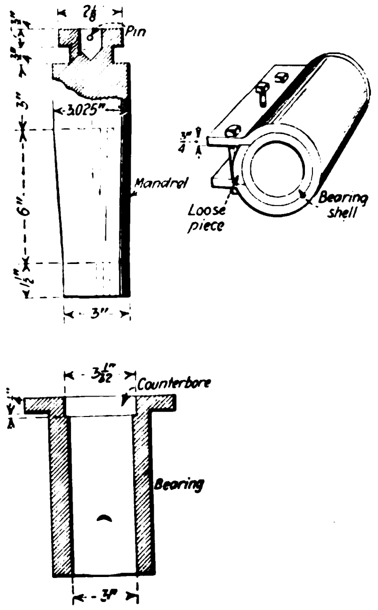


AIR PRESS FOR EXPANDING BEARINGS

A substantial table has been constructed to support the bearings while they are being expanded. This is supported immediately underneath the outside end of the lever by two large wooden blocks. The table itself is made of an iron plate and is 1½ in. x 18 in. x 4 ft. 8 in. in dimensions.

HOW THE BEARINGS ARE EXPANDED

In order to expand an armature bearing, it must first be made smooth and clean inside. To prevent the cracking of the end flange during expansion it has been found necessary to bore out the flanged end to a diameter approximately 1/32 in. larger than that of the remainder of the inside of the bearing. The depth of this portion of larger diameter should be approximately ¼ in. greater than the depth of the flange. This enlarging of the bearing under the flange removes the strain at that point. An accompanying sketch shows a bearing which has been finished to an inside diameter of 3 in. and gives the corresponding dimensions for the parts underneath the flange, together with the dimensions of the mandrel which is used for expanding such a bearing. The mandrel is tapered from a bottom diameter of 3 in. to a top diameter of 3.025 in., the bottom end being made straight for 1½ in. and the top for a distance of 3 in. To facilitate the handling of the mandrels a flanged top is turned on them, which is bored out inside and a pin is then inserted through this portion so that the mandrel can be readily lifted and handled with a hook.



AT LEFT, ARMATURE BEARING AND MANDREL USED FOR ITS EXPANSION. AT RIGHT, SLEEVE FOR HOLDING ARMATURE BEARINGS

To provide for uniform expansion and to support the bearing a sleeve is placed around it while it is being expanded. This is made of ¾-in. steel and is open on one side. When the bearing has been inserted a loose piece is placed in this open space and the entire sleeve is then clamped around the bearing by means of two bolts, as shown in the accompanying illustration.

The operation of expanding an armature bearing consists first of heating the bearing to a temperature of about 75 deg. F. The window of the bearing is then placed against the closed side of the sleeve and the open side of the sleeve is closed with the loose filler as already explained. The sleeve is then tightened into place with the two bolts and the bearing is then placed on the bench with the flanged end uppermost and the mandrel, which has previously been coated with a little white lead, is placed in the upper portion of the bearing. Pressure is then applied and the mandrel is forced entirely through the bearing. The plate on which the bearing rests is provided with a hole of sufficient diameter so that the mandrel will go through this and drop down approximately ¼ in. below the surface of the table. In pushing the mandrel through the bearing air should be applied slowly and uniformly. After the mandrel has been pushed through, the bearing can be removed by loosening the two clamping bolts and screwing in a third bolt which is located in the center of the sleeve. This expands the sleeve sufficiently so that the bearing can be readily taken out. The mandrel is lifted through the hole in the table by means of a hook, to which is attached a cable and handle. The bearing is then allowed to cool and then it is again pressed with the same mandrel as previously used.

These operations will expand an ordinary armature bearing about $\frac{1}{64}$ in. and the outside of the bearing can then be turned down so as to give a tight fit in its housing, and the inside can be babbitted and turned to the necessary size to fit the armature shaft.

SHAPING AXLE BEARINGS

As axle bearings of the usual type are made in two parts, these are pressed into shape and expanded by use of a type of mechanism shown at the left hand end of the halftone illustration. A large steel block is bored out approximately 0.01 in. smaller than the diameter to which it is desired to have the outside of the axle bearing. The round bar which causes the spreading apart of the bearing is made approximately 0.01 in. larger than the inside diameter of the finished bearing. These bearings are expanded by placing them in a horizontal position and by use of the mechanism already described.

This mechanism is also used for forcing bushings in worn housings. Where the housings are worn to such an extent that rebushing is necessary, a cast steel bushing approximately $\frac{3}{16}$ in. thick is forced into the housings and these are then bored out to exact diameter. The ends of these bushings have a flange and are pinned in place after they are installed. During the past year more than 800 armature bearings have been reclaimed by this method, most of which would have been scrapped had not some such apparatus been available.

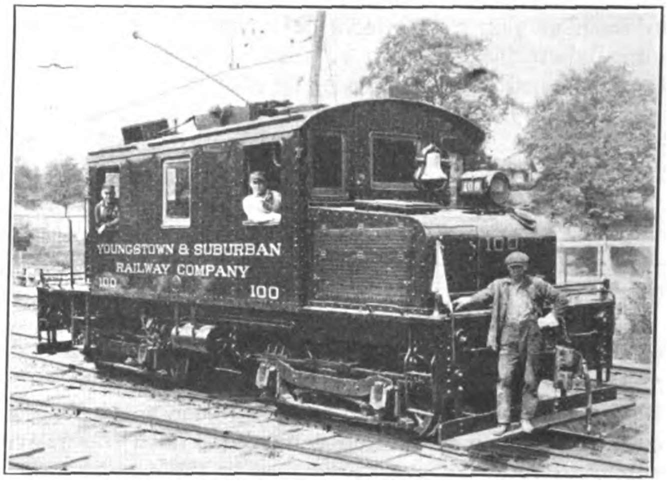
New Locomotive for Youngstown & Suburban Railway

THE Youngstown & Suburban Railway has recently placed in service a standard Class B, 45-ton Baldwin-Westinghouse locomotive, which was made necessary due to the increase in carload freight business. A large part of this business is made up of building materials handled by steam road equipment to a new tipple of a construction company. When completed, the total trackage from the railway company's switch to the end of the tipple will be more than 1,000 ft. and the total length of the tipple itself will be 550 ft., with bins having a capacity of approximately 3,000 tons of material. The various bins under this tipple are for the storage of sand and gravel and other building materials and will be arranged so that a 4½-ton truck can be loaded in 2 minutes. Directly opposite the tipple there is to be constructed 1,100 ft. of track with a clear space of 900 ft., which will be used for handling brick, tile, sewer pipe and similar material. At the right will be constructed garages and barns for thirty-five motor trucks and wagons and fifteen horses, and on the left will be warehouses, office buildings, etc.

NEW LOCOMOTIVE FOR YOUNGSTOWN & SUBURBAN RAILWAY

Weight	45 tons
Maximum tractive effort (25 per cent adhesion)	22,500 lb.
Normal tractive effort at 9.7 m.p.h., full field, one hour	15,200 lb.
Continuous tractive effort with forced ventilation, short field	9,000 lb.
Maximum trailing load starting on 1 per cent grade	789 tons
Balancing speed, short field at 600 volts, on level with 500-ton load	17.5 m.p.h.
Balancing speed, short field at 600 volts on 2.05 per cent grade with 350-ton load	10.2 m.p.h.

The new locomotive just purchased is equipped with four type 562-D-5, 600-volt, 100-hp. field control motors and HLF control. The maximum grade for this property is 2.05 per cent and the locomotive will handle five loaded 100,000-lb. capacity cars, or a train of fifteen empties, up this grade.

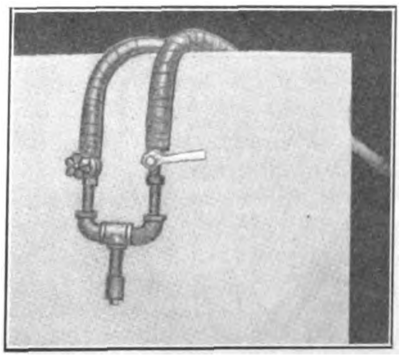


FORTY-FIVE-TON LOCOMOTIVE OF YOUNGSTOWN & SUBURBAN RAILWAY

The general characteristics of this locomotive are as shown in the accompanying table.

Cars Washed with Air and Water Flusher

A GREAT saving in cost of washing cars is now being realized by the Chattanooga Railway & Light Company by the use of its combination air and water nozzle, an illustration of which is shown herewith. This is one of the many convenient devices which have followed the installation of the new air compressor in the Chattanooga shops. It is a National compressor type 3VS-23, of 300-cu.ft. capacity and driven by a single-phase, 54-hp. motor. The flushing device consists simply of two ½-in. rubber hose lines, one for air and one for water, each leading through suitable controlling valves to a common nozzle. The whole device is a combination of ordinary pipe fittings. From the two valves there are bushings to ½-in. ells, which in turn lead to a tee, to which is connected another short bushing which is plugged at the end, a ⅛-in. hole being bored through the plug. Any combination of air and water can be discharged from this nozzle.



AIR AND WATER NOZZLE

The present method of cleaning out cars consists of first using the air line to blow out dust, after which a powerful stream of water is provided for flushing out the car, air and water being used here in combination. The results obtained by the use of this combination air and water stream are much better than from old hand-scrubbing or flushing out with water stream only, both from the cleanliness resulting and from the saving in time.

Under the former method of cleaning eight cars constituted a good day's work, whereas it is now possible to wash as many as twelve cars thoroughly with the same labor "besides two or three flivvers," as E. D. Reed, general superintendent, facetiously puts it. The only difficulty encountered, which is a minor one, is the handling of the double-hose line to keep it from getting twisted.

New Rock Crusher an Economical Addition at Charlotte

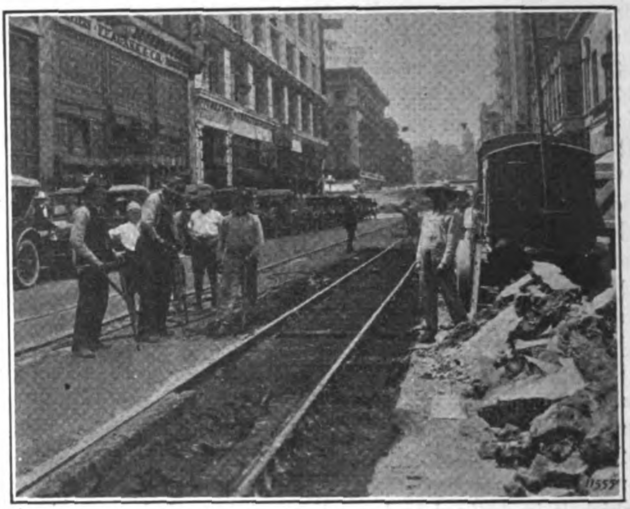
THE Southern Public Utilities Company has installed in Charlotte, N. C., a rock crusher which is proving to be a most economical addition. This company uses on the average about 200 yd. of crushed rock per month the year around. This had formerly been obtained at a cost of about $6.25 per ton delivered. With the native supply of rock, however, it seemed to the company that it should be possible to obtain this at less expense.

Accordingly, last December the company installed an Allis-Chalmers rock crusher with a capacity of 60 yd. per day and records since then indicate that the over-all cost of the crushed rock is now $2.50 as compared with the previous $6.25. Farmers and others haul rock into Charlotte and deliver it for $1.50 per ton, the other dollar representing the cost of crushing. In addition to crushing new rock, the crusher is also used to break up old cement and brickbats which are excavated by various contractors in connection with work in and around Charlotte.

Accompanying illustrations show the rock crusher and indicate how it is conveniently located by a siding of the company's electric railway in Charlotte. The crusher installation includes a belt conveyor which carries the rock with a minimum expense of handling. The crusher is adjustable to produce crushed rock from about ¾ in. to 3 or 4 in. in size. The company is well satisfied with this move it has made to produce its crushed rock more economically.

New Machines for Removing Pavement

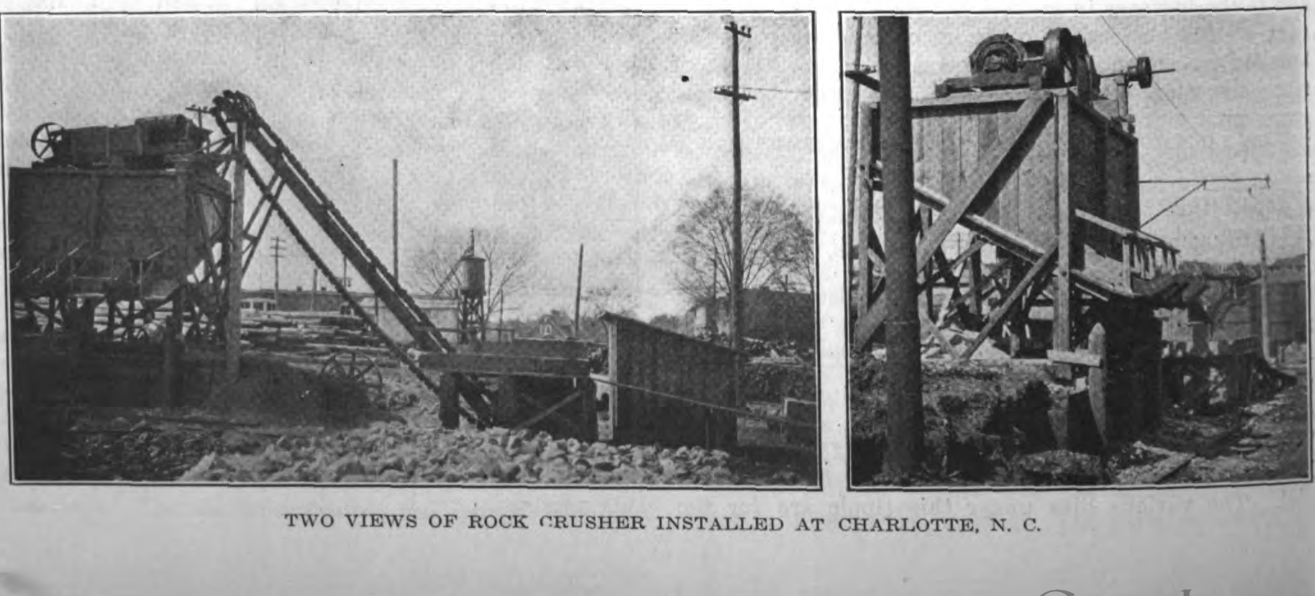
A NEW compressed-air-operated machine for removing pavement and general demolition work has just been placed on the market by the Ingersoll-Rand Company, New York. Two types of paving breakers, termed BC-25 and CC-25, are now available. The BC-25 type is intended for use with an air pressure of over 80 lb., while the CC-25 is for use with an air pressure less than 80 lb. The BC-25 type weighs 58 lb. and is 24 in. over all, while the CC-25 weighs 68 lb. and is 25 in. long. Both have a 4-in. stroke. In construction the paving breaker is very similar to the non-rotating type of hand hammer rock drill.



REMOVING PAVEMENT ALONG RAILWAY TRACK

The Los Angeles Railway Corporation used these breakers for cutting openings on either side of the rail through 6 in. of concrete having a covering of 2 in. of asphalt. The openings were about 23 in. long and extended 17 in. on each side of the rail. In this work it was found that two men with one paving breaker could cut twenty-two of these openings in nine hours. Under the old hand method this work would have required fifteen men. These openings were cut in order to give gripping place under the rail for the use of hydraulic jacks to pull the rail out.

The paving breakers are usually used in conjunction with the Imperial type 14 portable air compressors, which are either gasoline or electrically driven.



TWO VIEWS OF ROCK CRUSHER INSTALLED AT CHARLOTTE, N. C.

Letter to the Editors

Suggested Changes in Safety Car Design

TRENTON & MERCER COUNTY TRACTION CORPORATION

TRENTON, N. J., May 12, 1921.

To the Editors:

In a recent issue of the ELECTRIC RAILWAY JOURNAL there appeared an article by J. C. Thirlwall entitled "Why Alter the Standard Safety Car Design?" I am heartily in accord with most of Mr. Thirlwall's objections to fundamental changes in the general design of the standard Birney safety car, but our experience in the operation and maintenance of this type of car has convinced us of the desirability of several changes which could be made without sacrificing the essential features, such as dimensions of car body and low wheels.

In the March 12 issue of the ELECTRIC RAILWAY JOURNAL mention was made of the substituting of longitudinal seats running the full length on either side of our cars in place of the standard transverse seats. The object of this change was to determine whether the increased aisle width thus provided would not facilitate the loading and unloading of passengers at points of heavy interchange here in Trenton. The effect of this change has been to speed up passenger interchange and has tended to give a more even distribution of the passenger load over the entire car. Most of the crowding on the front end of the cars was due to the passengers' inability freely to move to the rear of the car on account of the restricted aisle space. By increasing the aisle width this handicap has been removed.

There are two other changes in the construction of the safety car which the management here feels would be beneficial and which could be made without increasing the weight or dimensions of the standard car. These are the substitution of a longitudinal seat for the first transverse seat at each end of the car on the entrance side and the elimination of the folding door opening outwardly by substituting a sliding door.

In regard to the safety features, we are considering changes to make the foot valve inoperative. With the many duties which are necessary for the one-man car operator to perform, there is a tendency to abuse this auxiliary to the controller pilot valve, and in considering the accidents which have occurred here in Trenton it has been found that this feature has been directly responsible for a large number.

Another improvement which could be advantageously made in the interests of safety is the removal of the door operating position from the brake valve. By eliminating this feature the brake valve could be redesigned so as to give more space between the various brake valve positions and thus decrease the liability of error. A number of accidents have been caused here due to the fact that in making a service brake application the operator sometimes throws past the service position to lap position, which is between the door opening and service application positions on the brake valve. If more space were available, a longer port and a greater radius could be obtained for the service application position, and the lap position could be moved further away so that there would be less liability of mistake by the operator. While these two changes may be considered quite radical, we feel that they have a special appeal to maintenance men and operators.

H. E. KROUSE, Master Mechanic.

Association News

Acting Secretary Welsh Addresses Yale Students

A PERSPECTIVE view of electric railway problems was given in a course of two lectures by James W. Welsh, acting secretary of the association, before the engineering students at Yale University, New Haven, Conn., on March 6 and 13.

He first dealt with mechanical and electrical studies such as the application of motor control and auxiliary equipment to railway cars and the economic problems connected with the replacement of old reciprocating type of plants by power generated in large central stations. In the former the development of the present high-speed motor was illustrated by the redesign of a standard city motor for interurban service.

The second lecture took up the traffic problems of a city system, illustrating the surveys to be made, the means of fitting the service to the traffic, and a review of the methods now employed for securing the maximum economy in car operation. The preparation of a working schedule or time-table was shown, starting with the traffic count and with special consideration given to the determination of the trainmen's runs as limited by the rules of the labor agreement.

Mr. Welsh employed a conversational method of questions and answers with the students and pictured the subject in such a way as to give them some realization of the difficulties involved as well as the attractiveness of the work in the field of transportation as a future business of life.

Heavy Traction Men Meet

A NUMBER of the heavy traction experts in the Engineering Association met on May 12 to round out the report of the committee on this subject. A sub-committee presented a remarkable compilation of data on electric locomotives and multiple-unit cars which was accepted for inclusion in the report with a few additions. A plan was also approved for the preparation of an analysis of conditions affecting the use of multiple-unit versus locomotive-drawn trains for suburban service, as a substitute for the statistical summary originally planned. The desirability of co-operation among heavy traction committees of national societies was again emphasized and a determination to push this matter was registered. The committee finally decided to compile a subject bibliography on heavy traction to be used as an appendix to its 1921 report.

Those in attendance were Sidney Withington, New Haven Railroad, chairman; A. H. Armstrong, General Electric Company; H. W. Cope, Westinghouse Electric & Manufacturing Company; J. C. Davidson, Norfolk & Western Railway; C. V. Duer and J. S. Sloan, Pennsylvania System; C. H. Quereau, New York Central Railroad; L. S. Wells, Long Island Railroad.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Radial Scheme Favored

Mr. Arnold Believes Ambitious Canadian Project Entirely Feasible Under Competent Management

Bion J. Arnold, Chicago, considers that the radial program of the Ontario Hydro-Radial Commission is very advantageously situated with regard to density of population, active industrial territory and probable increases of both these factors in the future, as well as having the advantage of a plentiful supply of cheap power.

In testifying before the commission during the week ended April 30 Mr. Arnold pointed out that carload shipments in large volume have not usually been handled by the average interurban electric line, but that with the type of construction and facilities proposed by the Hydro-electric Commission for the radial lines, they would be in a position expeditiously and economically to handle a reasonable amount of carload freight business.

Taking into consideration the estimated population in 1925, 1930 and 1935 of the various territories served by the different lines, Mr. Arnold showed three lines, the Toronto & Eastern, the Toronto Suburban and the Hamilton & Elmira divisions, as having slight deficits in 1925. He pointed out, however, that these deficits were figured on construction costs estimated at the high peak period of about a year ago. In view of reductions in cost since that time he thought that the newly constructed lines might be found to pay from the start. The Toronto, Hamilton & St. Catharines and the Niagara, St. Catharines & Toronto radials, he estimated would be paying propositions right from the start, having a net income or surplus of $145,000 and $129,000 respectively in 1925.

$800,000 SURPLUS ANTICIPATED

By 1930 Mr. Arnold estimated that the whole system would show a surplus of $796,000 on the year's operations, and by 1935 this would be increased to more than $1,000,000.

One point emphasized was that of terminal facilities and grade separation in the cities. The radials must be able to enter and leave the cities at high speed. Regarding the proposed Toronto terminal at Bay Street, he suggested a combination of elevated structure and subway leading from it. The overhead track would end at Front Street, and the cars would then enter a subway extending up to Queen Street. He favored an uptown terminal nearer the business center, but was not ready to state just where this should be located.

The radials would have an advantage in handling less-than-carload freight.

Summing up the transportation requirements, it would appear that the area in which the system is proposed, being the center of population and manufacture of the province, should be provided with every transportation service which will aid its commercial and industrial welfare. This should include transportation facilities of the type proposed by the Hydro-electric Power Commission, the main feature of which is frequent passenger transportation at high speed, supplemented by frequent and prompt deliveries of less-than-carload freight.

LARGE CAPITAL EXPENDITURES REQUIRED BY STEAM ROADS

For the steam roads to give the facilities required and proposed by the Hydro-electric Commission, they would have to make large capital expenditures and would also have to organize additional operating departments properly to handle the different classes of service required.

Regarding fast freight service, Mr. Arnold recommended that as it is proposed to furnish this to all points on the line. This freight would be carried on interurban express and on freight cars which, as a rule, would make two trips daily between the various terminals, providing for one-day shipments from point to point.

The estimates as to earnings had been made separately for the five divisions, and all passenger-earning estimates are based upon population figures and data as to the riding habit of the residents of each locality.

While the system as a whole cannot be compared with any existing interurban, combining, as it does, rapid transit, suburban and interurban features, with despatch and carload freight traffic, each of these classes of service has its parallel in existing systems, and when analysis of the estimated operating costs of these classes of service has been made, they lead to the conclusion that the project now outlined as a whole is feasible, and that if constructed and operated under competent management, with the support of the communities served, success for the road can be reasonably expected.

Readers, Note Well

The United States Civil Service Commission announces an open competitive examination for senior signal engineer. Applications must be filed with the Civil Service Commission, Washington, D. C., prior to the hour of closing business on June 7, 1921.

Union Contract Renewed

Winnipeg Railway Makes Reservations on Wages and Rejects "One Big Union" Idea

The Winnipeg (Man.) Electric Railway has signed an agreement with its motormen and conductors for the next twelve months, granting the trainmen the same wages and working conditions as prevailed last year.

The 1920 agreement was made between the company and "the Street Railway Men's Union," an independent organiation with no affiliation with the Internationals or any other body. After the agreement of May 1, 1920, had been signed the trainmen joined the One Big Union—a political organiation with revolutionary tendencies which was directly responsible for the strike of six weeks in Winnipeg in 1919.

When the 1920 agreement was about to expire the Street Railway Men's Unit of the One Big Union demanded that the company sign its agreement with them as representing the O. B. U., thus giving recognition to this body. This the company positively refused to do and declined to negotiate with the O. B. U. at all.

EMPLOYEES WITHDRAW DEMAND FOR UNION RECOGNITION

The company said it was prepared to negotiate an agreement with a committee of men, but that if the men insisted on recognition of the O. B. U. the company would go to arbitration and open up the whole agreement as to wages and working conditions. After several mass meetings the demand for recognition of the O. B. U. was withdrawn, the men appointed a committee to represent them, and an agreement was signed on May 9 between the company and "Motormen and Conductors of the Winnipeg Electric Railway as represented by a committee executing this agreement."

In all its agreements so far executed with its employees the company has stipulated that it will maintain the same rate of wages as prevailed last year.

The agreements contain a clause, however, which says "if at any time during the currency of this agreement, by any reason of something beyond its control the company is deprived of any considerable portion of its revenues, and is thereby rendered unable to pay the wages herein agreed to, the company shall be at liberty to give thirty days' notice to terminate this agreement insofar as it affects the rates of wages."

Wages Reduced by East Mass. Arbitration Board

Cut Made Averages 12½ per Cent—Burdensome Seniority Rules and Other Provisions Modified

An average wage reduction of 12½ per cent, elimination of burdensome seniority rules and certain overtime and special allowances featured the decision handed down by the Massachusetts Board of Conciliation and Arbitration in the case of the Eastern Massachusetts Street Railway and its employees who are members of the Amalgamated Association. The ruling of the board was announced on May 14, but is retroactive to May 2, the date when the former agreement expired, to be in effect for one year to May 1, 1922. An immediate reduction in fares is planned.

PRIOR to the expiration of the old agreement the trustees of the Eastern Massachusetts had announced that wages would be cut 20 per cent, and further proposed to cancel the entire agreement. Threats of a strike on the system were heard, and up until the last day of the old agreement it appeared as though no settlement could be made which would avoid a walkout of the men.

On the final day, however, both sides agreed to submit the case to arbitration by the State Board, and arrangements were made to have the case heard and settled promptly. Before going to the board the trustees and the men drew up a new agreement, leaving only the questions of wages, overtime and certain other provisions, twelve points in all, to be arbitrated.

Public hearings were commenced on May 5 and completed on May 9, the decision being given five days later. The case for the company was conducted by Arthur G. Wadleigh, himself one of the trustees. The employees were represented by Attorney James H. Vahey.

Evidence relating to the decline in cost of living was introduced by both sides, Prof. Albert S. Richey testifying as a witness for the company, and Arthur Strugis, connected with the statistical bureau of W. Jett Lauck at Washington, as a witness for the union. Professor Richey produced figures indicating an average decline in the cost of living since May 1, 1920, of 22½ per cent, and predicted a further slow but continuous reduction in prices. Mr. Sturgis contended that costs are still double the pre-war basis, and that any apparent decline is only a temporary seasonal fluctuation.

The company introduced statements relative to the still precarious financial condition of the property, and although the attorney for the employees claimed it should not be considered in fixing wages, the board did not rule it out. What consideration the board gave to this matter, if any, the members did not state in their finding, although they referred to it as having been introduced.

The new scale of wages for motormen and conductors will be 49 cents, first 3 months; 52 cents, next 9 months; and 54.5 cents thereafter, as compared with 56, 59, and 62 cents respectively under the former agreement. The differential of 5 cents for operators of one-man cars remains unchanged, although a strong effort was made by the union to have it increased to 15 cents. Nearly 90 per cent of the car mileage of this property is operated with one-man cars.

The old and new rates fixed for other employees under the amalgamated agreement is as follows:

Occupation	Old Rate	New Rate
REPAIR SHOP AND ROLLING STOCK		
Assemblers	62	54.5
Blacksmiths	62	54.5
Blacksmith helpers	58	51
Babbitters	60	52.5
Carpenters	62	54.5
Carpenter helpers	58	51
Car cleaners	58	51
Firemen	62	54.5
Machinists	63	55.5
Machinists helpers	58	51
Painters	62	54.5
Pattern makers	62	54.5
Pitmen	61	53.5
Pitmen helpers	58	51
Upholsterers	61	53.5
Upholsterers helpers	..	....
Watchmen	58	51
Winders	63	55.5
Winders helpers	58	51
Wiremen	62	54.5
Wiremen helpers	58	51
Letterers	64	56
Tuckmen	62	54.5
Truck helpers	58	51
General helpers	58	51
Electricians	62	54.5
TRANSPORTATION DEPARTMENT		
Crossing tenders	58	51
General helpers	58	51
POWER PLANT		
Assistant engineers	76	66.5
Firemen	66	58
Foreman of helpers	66	58
Firemen helpers	62	54.5
General helpers	59	52
Oilers	62	54.5
Pipe coverers	66	58
Repairmen	64	56
Substation operators	62	54.5
Switchboard operators	65	57
Hoisting engineers	68	59.5
ROADWAY DEPARTMENT		
Trackmen	58	51
LINE DEPARTMENT		
Linemen	67	59
Linemen helpers	59	52
STORES DEPARTMENT		
Chauffeurs	58	51
Helpers	58	51

The twelve specific issues arbitrated and the board's decision in each of the issues were as follows:

1. Shall basic wages be reduced to the scale in effect April 30, 1920? Answer: That there shall be a reduction in the basic rate now in force of 12½ per cent. Where this reduction when applied to the hourly wage results in a fractional part of a cent a fraction of five mills or less shall be paid for as half a cent; fractions over five mills shall be paid for as 1 cent.

2. Shall there be any change in the differential paid to men while operating one-man cars? Answer: That there shall be no change in the differential of 5 cents per hour paid to operators of the one-man car.

3. Shall seniority be abolished? (A) in shops; (b) in carhouses; (c) in track departments; (d) in power plants; (e) in the line department? Answer: Yes, in all classes specified.

4. In case of a curtailment of force shall employees hold their seniority rights for a period of six months so that in case of increasing force they shall be returned to the service in accordance with such seniority before any new men are hired? Answer: No.

5. Shall the computation of time for runs of conductors and motormen be changed from computation to fifteen minutes and half hour periods to computation to ten minute periods? Answer: No.

6. Shall relief for thirty minutes or less be paid for? Answer: Yes.

7. Shall employees in the mechanical and miscellaneous departments be allowed ten minutes under pay to wash up? Answer: No.

8. Shall men in the mechanical and miscellaneous departments who work eight hours on Sundays and holidays and nine hours on week days be paid nine hours' pay for the eight hours' work on Sundays and holidays? Answer: No.

9. Shall employees be paid at the rate of time and a half for work done on Sundays and holidays? Answer: (A) In shops, in carhouses, in track department, in power plants, in the line department. No in all classes specified.

10. Shall employees in the mechanical and miscellaneous departments when doing overtime work be paid compensation in addition to their regular hourly rates? Answer: Yes, at the present rate of time and a half.

11. Shall employees in the rolling stock shops be allowed Saturday half holiday with pay? Answer: No.

12. Shall it be provided that regular employees of the mechanical and miscellaneous departments, who have worked one continuous year or two consecutive full track seasons, shall not have their wages reduced by reason of occasional rainy or inclement weather? Answer: No.

The decision of the board affects in all about 1,850 out of the 2,400 employees of the Eastern Massachusetts Street Railway. Both sides had agreed in advance to abide by the decision of the arbitrators.

The following brief statement was included in its official findings, as the basis of the board's decision:

> It appears that the increase in wages received by the employees upon this system since Oct. 1, 1914, has exceeded in percentage the increased cost of living during the same period. The board recognizes that the justification for such increase was not entirely based upon the increased cost of living. It is generally recognized, however, that such increase has been the controlling factor in justifying the increase in wages of the employees during this period, and further that there has been a substantial decrease in the cost of living, the official report of the Massachusetts Commission on the "Necessaries of Life," covering the period to May 1, determining such decrease from July 1 to be 18.8 per cent. After an examination and consideration of the evidence, including exhibits twenty-eight in number, together with the able arguments of counsel, the board determines that a reduction in wages is warranted at the present time.
>
> The board finds sufficient reason for including in the new agreement certain of the working rules and conditions submitted, but as to the remainder, whatever reason there may have been for their adoption, the board finds no sufficient justification to warrant their continuance.

In accordance with their promise to the public, the trustees of the Eastern Massachusetts Street Railway are planning to put a reduced scale of fares into effect in the immediate future. As soon as the percentage of the wage reduction was made known, they commenced the preparation of a new scale of ticket fares, all over the system, which they expect to announce within a few days.

Nova Scotia Company Cuts Pay.—A general wage cut of from 8 to 10 per cent was put in effect on May 1 by the Cape Breton Electric Company, which operates the interburban tram lines of the island.

Deferred Payment of Taxes Proposed

A bill which would require electric railways operating in Connecticut to pay up their back taxes within a period of six years has been reported by the finance committee of the Connecticut Legislature. The amount of unpaid taxes due at present is about $2,000,000. The bulk of this approximately $1,800,000 is owed by the Connecticut Company.

The measure would require each year the payment of one half the annual net income of the companies, in addition to the tax for that particular year. It would go into effect on July 15, 1922, and the taxes for the present year would be deferred until that time, and added to the total of unpaid taxes. Companies which pay up their indebtedness within six years' time would under the provisions of the bill pay interest at the rate of 4½ per cent, while from those not completing payments 8 per cent would be levied. By the time the first payment would come due, it is estimated that the Connecticut Company would be in debt to the State to about the sum of $2,500,000. The first payment would be in the neighborhood of $750,000.

The president and treasurer, or receiver, of a company would be required to file an annual statement under oath showing the amount of each item, of which the gross and net income respectively is made up. The net income is to be computed by deducting from the gross income items of operating expenses, expenses of auxiliary operation and leased roads, miscellaneous rents, taxes paid, interest on funded debt, interest on floating debt and miscellaneous charges for the preceding year.

Unions May Be Sued in Massachusetts

An amendment to the General Law of Massachusetts, governing voluntary associations, has just been enacted, which permits all such associations to be sued. The progress of this amendment through the Legislature was marked by the most bitter opposition on the part of organized labor interests. The representatives of labor claimed that the bill was aimed directly at the unions, and sponsored by the financial interests, as it lays the union organizations, as well as other associations of individuals, open to suit.

The objection of the union interests was directed less against the principle of subjecting them to suit, than to the alleged liability of having their funds tied up by employers bringing suit when a strike may be in progress. This, the union interests claim, may be resorted to, in order to break a strike, as the union would be unable to pay its members strike benefits, and expend funds for other purposes which are considered essential in the conduct of a strike.

The strike was termed labor's only weapon, and this legislation was condemned as an attempt to weaken labor's one source of strength.

In spite of this opposition the amendment was passed and sent to the Governor. The labor people then carried their fight to the Governor's office, urging him to veto the bill. After hearing all the objections and giving due consideration to the subject, Governor Cox signed the bill. He made a public statement on the matter, saying that the bill was not aimed at labor, but it included a number of other voluntary associations, all of which should be subject to suit at law as well as labor unions. He called attention to the fact that similar legislation is in force in twelve other states, and advised the labor unions that their interests were sufficiently protected.

Day of Emergency Rates Gone

The Board of Public Utility Commissioners of New Jersey will no longer allow temporary rate increases to cover so-called emergency periods, Chairman John J. Treacy of the board announced on May 17, and added that all the factors of a normal rate-making case must be before the board before a decision is made.

Chairman Treacy declared that the theory will no longer hold that was developed during the war to the effect that temporary rates must be granted to tide utility concerns over a period of abnormal costs.

The announcement of Chairman Treacy was made when Rankin Johnson, president of the Trenton & Mercer County Traction Corporation, appeared before the board seeking a date for the cross-examination of Ford, Bacon & Davis, who appraised the company's property for the State when the railway applied for an increase in fare of from 7 cents to 10 cents.

According to law the commission must render a decision in the case by May 31, otherwise the company has the right to put into effect the 10-cent rate.

Mr. Johnson was asked to agree to an extension of this time until June 15, stipulating upon behalf of the company that the new rate would not become effective until the board reached its decision. To this Mr. Johnson demurred, declaring that an emergency existed and that the company's financial situation was desperate. He asked that a temporary rate be granted until the permanent rate could be formally established.

Chairman Treacy of the board in the course of his remarks said:

> The board is reluctant to extend a theory which was developed to cover a national emergency, the war, beyond the period of the emergency itself. This board is not going to grant any emergency applications unless the situation is so critical that it is imperative for it to do so.

Commissioner Harry V. Osborne indicated that he thought that continual changing of utility rates was unsettling to the public and to financial conditions generally. The board fixed May 31 for the continued hearing in the Trenton case.

Large Area for Future Development Opened

Governor Miller of New York recently signed the bill proposed by Senator Smith of Staten Island which will give Staten Islanders rapid transit facilities between Richmond and New York City within three years. For over twenty years residents of the island backed by big business interests have fought for a transit connection between the Borough of Richmond and Brooklyn. The passage of the new law will require the city to begin within two years the construction of a passenger and freight tunnel between the two places. Governor Miller commenting on the bill said:

> Such a tunnel must necessarily be a part of any comprehensive plan for the development of the port. Indeed, it appears to me that it is one of the obvious things that may speedily be done to relieve congestion and to eliminate much of the costly with a terminal service now required, for by that means it should be possible to provide direct service from the transcontinental railroads to a large territory with a rapidly growing population now cut off from such service. Such a tunnel, with proper connections, will bring the transcontinental railroads to the very centre of the great metropolitan district.
>
> The city of New York already is expending a large sum in the construction of docks on Staten Island and it would seem that transportation means other than by water between Richmond and the other boroughs should be provided as speedily as possible.
>
> The need of such a tunnel is obvious. Its building has now been too long delayed. Nothing can be done under this bill before another session of the Legisestimates.

Electric Equipment Sale May Settle Title Question

Because he built on an island, made in the middle of the bay, title to which bottomland has been vested in the city but without the right to transfer it, Carl G. Fisher, developer at Miami, Fla., has offered to sell for $1,125,000 an electric power house for lighting and power, carhouses and other equipment that cost him $1,265,403. By the purchase the tangle over the title question would be settled. The island was built up by the Fisher interests after the bay bottom had been purchased. Mr. Fisher also offered to sell the trolley line of the Miami Beach Electric Company to the city, "and not at a profit either."

At the conclusion of the general discussion, the offer having been made in an open meeting of the City Council, City Attorney S. P. Robineau was authorized to go to Tallahassee, the state capital, to take up with the Internal Improvement Board the question of title, with the hope that there might be still some way out of the tangle. The tangle actually dates back to a state law a dozen years ago, deeding to Florida cities all submerged lands within their corporate limits, but with the proviso that title shall always be vested in the municipality. Later the Fisher interests approached the Internal Improvement Board, which controls state lands, and neither thinking of the state law, the board sold the Fisher interests eleven acres of bay bottom.

Municipality Follows Up Its Advantage

The figures of the Detroit (Mich.) United Railway on the cost of constructing the 25 miles of day-to-day lines which the city electors voted to take over have been submitted to the city. The total cost of these eight lines is placed at $1,965,942, or approximately $80,000 per mile. Accountants for the city will check over the figures submitted by the company and engineers for the city will go over the lines with the company's engineers to determine depreciation.

Arbitration of the construction costs and depreciation will be urged by the city as soon as the figures have been gone over, since Mayor Couzens is anxious to have the question of costs settled before the city declares itself ready to take over the lines. E. W. Bemis, Chicago, has been retained by the city to appraise the eight day-to-day lines.

Announcement has been made by Mayor Couzens that the electors of Detroit will be asked to vote at the next election on the question of giving the Street Railway Commission power to acquire the Fort Street and Woodward Avenue lines, Detroit United Railway lines for which the franchises have expired. This is the first action taken in regard to these lines since the April 4 election when the company's service-at-cost plan was defeated.

Railway Firm—Will Not Arbitrate

Prospects seemed remote on May 13 for the early resumption of service on the Scranton, Montrose & Binghamton Railroad, Scranton, Pa., shut down since April 18. Union officials were still firm then in their stand not to permit the employees to accept a cut in wages or permit the working conditions to be modified except by arbitration. The railroad management was equally firm in its stand not to arbitrate a matter where the possibility existed of it not being able to carry out the arbitration decision. The line runs between Lake Winola and Montrose, Pa.

Failure to agree with the employees over a new contract for wages and working conditions forced the company to suspend service. The company made a contract in 1916 with its trainmen for four years, at a maximum of 30 cents an hour, but voluntarily increased wages each succeeding year, granting two advances in 1920, so that the trainmen in April, 1920, were receiving 60 cents an hour, with other employees paid in proportion.

Shortly before the April, 1921, agreement expired the operating statements of the company were placed before a committee of the employees for their consideration. They showed that the company was fast losing money with wages taking 68 per cent of the revenue. Accordingly the men were asked to take a reduction of 25 per cent. This proposal they flatly rejected.

In a final effort to reach an adjustment the company suggested a 12½ per cent reduction in wages and modification of the working agreement so the company could use one-man cars wherever the management thought it practical.

The company stipulated that if anything were made above fixed charges during the year of the contract, the sum so earned would be applied in the form of an additional wage payment, thus cutting down the 12½ per cent wage reduction. This plan was also rejected, but by a small majority vote.

The men wanted the whole matter arbitrated. This the company has refused to do. The villages along the road have been hard hit, as they depended upon the power plant of the railroad for lighting and power, but an agreement has been made with the power-house men to work at the old scale and the consumers have submitted to an increase of 40 per cent in rates to meet the extra expense which is entailed.

Indeterminate Grants to Be Accepted

The Citizens Gas Company and the Indianapolis Street Railway are preparing to surrender their franchises granted by the city of Indianapolis and operate under indeterminate permits granted by the Public Service Commission, it is understood at the office of the commission. The railway franchise provides for the sale of six tickets for 25 cents, but its provisions have been set aside by the commission, under the emergency relief section of the public utility law.

The Legislature of 1921 authorized utilities operating under franchises from cities to surrender the franchise and operate under the 1913 act creating the State Public Service Commission. Under a section of the 1913 law, any public utility under an emergency can be operated during the emergency under the commission regardless of its franchise. It is under this section that the gas company and the railway are operating temporarily.

Program of Meeting

Pennsylvania Street Railway Association

The Pennsylvania Street Railway Association will hold its annual meeting at the Penn-Harris Hotel, Harrisburg, Pa., on June 16 and 17. One of the prominent speakers will be P. H. Gadsden, president of the American Electric Railway Association. Topics that are of vital interest to the industry will be touched on, such as Financing, Handling of Materials and Supplies, and a paper from an official of the Pennsylvania State Chamber of Commerce on the Value of Co-ordination and Friendly Relations Between the Merchant, Street Railway and General Public.

Details of Detroit United Wage Reduction

Final agreement having been reached between the Detroit United Railway and representatives of the platform employees regarding the wage reductions, notices have been posted by the company stating the change in rates of pay effective on May 1, as affecting motormen and conductors. The rates of pay made retroactive from May 1 for motormen and conductors in passenger and freight service are: 55 cents an hour for the first three months; 58 cents an hour for the next nine months, and 60 cents an hour thereafter.

Regular motormen and conductors will be paid time and one-quarter for extra or tripper work on week days. Time and one-half will be paid for extra or tripper work for Sundays or holidays, and also for the time in runs in excess of eight hours on Sundays and holidays.

The time intervening between the completion of regular runs and the starting time of extra or tripper work will be paid for at the regular rate of pay, when such intervening time does not exceed five hours. The limit of five hours thereby established for the time intervening is not to apply to men operating day runs.

A minimum guarantee of two hours at the overtime rate will be paid night men when they are required to report for and operate an a.m. tripper in addition to their regular run.

Extra men when required to operate tripper or do extra work after the completion of a regular scheduled run will be paid time and one-quarter for such extra service.

Freight men will be paid time and one-quarter for extra service and for the time in the runs above eleven hours on week days, and time and one-half when required to work in passenger service on Sundays and holidays, except where such service is performed for the purpose of allowing men regularly assigned in the passenger service to be relived from Sunday duty; and at their regular rate of pay for the time intervening between the completion of their regular run and the starting time of the extra or tripper work.

Penalties for scheduled swing runs will be as follows: For the fourteenth hour, fifteen minutes; for the fifteenth hour, an additional fifteen minutes; and for each consecutive hour thereafter an additional thirty minutes.

Employees on the Port Huron, Mt. Clemens and Ann Arbor city lines will receive 2 cents an hour less than the rate for the other Detroit United Railway platform employees.

Wage Cut in Dubuque.—Trainmen of the Dubuque (Ia.) Electric Company have had their wages reduced from 60 cents an hour to 45 cents. The company recently decided to cut wages and lower rates as a readjustment measure. The trainmen remained at work, but referred the reduction to their officers for consideration.

New York State Arbitration to Begin

The arbitration board in the New York State Railways wage dispute with its employees of Utica, Rochester, and Syracuse will begin sessions at Rochester on May 23. The arbitration board will be composed of Judge Arthur E. Sutherland, of Rochester, choice of both factions as neutral members of the board; B. E. Tilton, vice-president of railway, company arbitrator, and James H. Vahey, Amalgamated counsel, arbitrator for the union employees.

The big issues before the board will be the decision of whether the men shall accept a wage cut averaging 25 per cent and will also work more hours than nine, which is their present working day.

Details as to overtime wages are also to be worked out. The new wage agreement is now in force, but any alterations made by the board will be retroactive from May 1.

Wages Reduced in New Orleans

The employees of the New Orleans Railway & Light Company, New Orleans, La., members of the Amalgamated Association, Division 194, have come to an agreement, through a committee representing them, with the receiver by which, beginning on July 1, 1921, a new scale of wages will go into effect. The new scale affects about 2,600 employees of the company. It reduces the present wages of the men, according to the character of the work performed, from 8 per cent to 25 per cent, and removes all possibility of a strike for another year, beginning April 18, 1921.

Both the employees and the company express themselves as satisfied with the arrangements. There is no change in the working conditions. It is estimated that the new wage scales will save the company from $300,000 to $500,000 annually.

Although the wage question has been adjusted little progress has been made toward settling other matters facing the company. The citizens' committee that has been opposing the increase in fare from the franchise rate of 5 cents has suspended its activities for the time being pending action by the Commission Council, after the hearing on the injunction before the United States Supreme Court. Assistant Attorney General Hall of Louisiana is now in Washington, D. C., looking after the matter.

Senator E. M. Stafford, who has taken a leading part in the agitation for lower fares, said on May 14:

> I know there is a movement on foot to establish a bus system in New Orleans, which will bring about a material reduction in the cost of transportation. As a matter of fact, figures are being compiled from statistics gathered throughout the country, such as the cost of cars and their up-keep which will enable those directing the movement for a bus system to come to some definite conclusion. If the system is put into operation, books of tickets will be sold so as to provide for a 5-cent fare.

J. J. McLoughlin, who has been associated with Senator Stafford, knew nothing definite about the establishment of the bus system referred to by Senator Stafford, but said that discussion had been held of a plan to install a twenty-car bus system to run out St. Charles Street to either Jackson Avenue or Louisana Avenue. Beyond that, he knew nothing.

It was announced on May 15 that C. C. Chappelle, New York, representing Eastern bankers who are interested in the company at New Orleans, would arrive in New Orleans on May 16 bringing with him a new plan on which he hopes that the Commission Council and the bankers may reach an agreement.

News Notes

Arbitration in Little Rock.—Trainmen of the Little Rock Railway & Electric Company, Little Rock, Ark., have opposed the 20 per cent wage reduction proposed by the company and the dispute will be arbitrated. W. J. Terry has been selected by officials of the company and T. M. Mehaffy has been chosen to represent the men. These two men will select the third arbiter. The present contract with the men expires on May 22. This company recently applied for a 7-cent fare.

Try to Force Track Repairs.—Some of the town officials of Cicero, a suburb of Chicago, recently tried to enforce their demands upon the Chicago & West Towns Railway for track repair by barricading the right-of-way. After the cars had run through these barricades Bert Collett, general superintendent, and a supervisor and two motormen were arrested on a charge of disorderly conduct. Later steam rollers were used to block the track until a temporary injunction against the town officials was granted the traction company.

Massachusetts Commission Reports Living Costs Decrease 20 Per Cent.—The Massachusetts Commission on Necessaries of Life has recently issued a report indicating a reduction of 17.9 per cent in the average retail price of commodities as compared with peak prices during the summer of 1920. The report cites a group of commodities costing $202.60 last July as now selling for $166.40. In the case of foodstuffs the decrease is approximately one-third and clothing about 30 per cent. Fuel and rents, however, still maintain high levels.

Open Shop in Eureka.—A strike of the trainmen of the Humboldt Transit Company, Eureka, Cal., terminated recently with practically a 100 per cent non-union personnel. The men voted to strike on March 18 because some members had been discharged for violation of rules. The company refused to arbitrate and mustered about 50 per cent of crews the morning of March 19 and in twenty days all cars were operated. For several years past the city of Eureka has been about 90 per cent union. It is stated now that about 60 per cent of the business people have been converted to the open shop plan.

Valuation Bill Signed by Governor.—Governor Miller of New York on April 27 signed the Knight bil amending the law under which the Transit Commission in New York City was created, so as to make the earning ability of traction companies at the rate of fare to which they are limited by contract or franchise stipulations a determining factor in valuation. The act also brings suburban and interurban transit lines operating within New York City under the jurisdiction of the new Transit Commission. The terms of the measure were reviewed at length in the ELECTRIC RAILWAY JOURNAL for April 23, page 786.

Committee to Examine Pittsburgh Situation.—The Pittsburgh Chamber of Commerce has notified the City Council of the appointment of a special committee to study the electric railway situation in Pittsburgh and report on the best solution of any difficulties that may be found to exist. The committee is composed of Samuel Harden Church, president of the board of directors of the Carnegie Institute; George S. Davison, president of the Gulf Refining Company; T. P. Gaylord, acting vice-president of the Westinghouse Electric & Manufacturing Company; A. J. Logan, president of the A. J. Logan Company, and Lawrence E. Sands, president of the First National Bank.

City May Test New Minnesota Act.—According to City Attorney Nelson of St. Paul, Minn., legal action will be taken to test the validity of the bill passed by the recent Legislature putting control of street railway lines under the Railroad & Warehouse Commission. Formal objection by the city will not be made, however, until the St. Paul City Railway takes steps to secure authorization from the commission for issuance of further securities or to obtain an increase in fares. A digest of the provisions of the new law was published in the ELECTRIC RAILWAY JOURNAL for April 30, page 82.

Council Opposed to Wage or Fare Change.—The City Council of Sioux City, Iowa, decided in effect to reject the demands of the Sioux City Service Company for an increase in fares, and through Mayor Wallace M. Short issued a statement saying that the Council is "willing to let" the present arrangement continue in effect. That arrangement provides for a 6-cent fare for a period of three years from September, 1920. The Council also stated that it expects the Service company to make no cut in the present wage scale of employees. This probably will mean the starting of an action in court on the part of the Service company to bring about an increase in fare to either 8 or 10 cents.

Financial and Corporate

$3,675,050 Increase in Gross

Economies Put Into Effect by Receivers at St. Louis Reflected in Earnings —Fare Collections Better

An outstanding feature of the 1920 annual report of the United Railways, St. Louis, issued recently by Rolla Wells, receiver, is that $500,000 of the increased revenue was due to better fare collections.

Better care in fare collection methods are ascribed by Colonel Albert T. Perkins, manager for the receiver, to the employment of additional car auditors—28 instead of 19—the use of fare boxes, and the weeding out of dishonest conductors. More than 200 men have so far been discharged. At first the union insisted upon arbitration, but after most of the cases had been lost arbitration practically ceased.

Signs carried in the light-box space on the front platforms of cars request passengers to deposit their own fares, and also inform them that "conductors are not permitted to deposit fares except under unavoidable conditions." The public is being convinced that car service nowadays is practically on a cost basis, and that diverted fares have a direct bearing on the rates of fare. Of collections, the report says:

> In the Spring of 1920 the Public Service Commission ordered the Receiver to put into effect on April 11, 1920, a flat fare of 7 cents for adults and a flat fare of 3 cents for children; these rates taking the place of previous cash fare rates of 8 cents for adults and 4 cents for children, combined with the sale of two adult tickets for 15 cents (sold on the cars) and 7 tickets for 50 cents and 50 tickets for $3.50 (sold at stations all over the City), and the sale of children's tickets 2 for 7 cents.
>
> The result of this order was to reduce the average rate of fare by 0.37 cent—cutting down the earnings $3,000 per day. This great loss was not offset by any material benefit to the public, as the difference had been borne largely by the casual rider who paid cash or by passengers who were not interested enough to buy 7-cent tickets.

The comparative income and expense statement shows gross operating revenue for 1920 to have been $20,267,730, as against $16,592,679 for 1919, an increase of $3,675,051. The total operating expenses, depreciation and taxes were $16,712,143, as against $14,303,639, an increase of $2,408,504. The net income for 1920 was $1,083,428, as against a deficit of $265,781 in 1919, an increase of $1,349,209.

From Jan. 1 to April 11, 1920, the United Railways cash fare for adults was 8 cents or two tickets for 15 cents (sold on the cars) and 4 cents for children. Tickets in lots of seven for 50 cents and 50 for $3.50 were sold at stations all over the city. Children's tickets were sold on the cars two for 7 cents. On April 11 the basic rate of fare was reduced to 7 cents and to 3 cents for children.

After the rate of fare had been reduced wages went up. The previous wage agreement expired June 1, 1920, and the State Public Service Commission, acting as arbitrator, raised the wages of motormen and conductors 5 cents an hour. This made the scale 55 cents for the first six months, then 60 cents an hour to the end of the second year, and 65 cents an hour for those who have served more than two years, the latter class including about 80 per cent of the employees.

INCOME STATEMENT—UNITED RAILWAYS, ST. LOUIS

Year Ended Dec. 31	1920			1919	
	Actual	Per Cent of Operating Revenue	Per Cent Increase	Actual	Per Cent Operating Revenue
Operating revenue—					
Revenue from transportation:					
Passengers	$20,113,799	......	22.20	$16,463,312	......
Special cars	32,791	......	40.70	23,297	......
Express	8,244	......	*27.18*	11,323	......
Total	$20,154,834	99.443	22.10	$16,497,932	99.43
Other railway operations:					
Station and car privileges	80,000	......	18.50	67,510	......
Rent of equipment	455	......	......	....	......
Rent of buildings, etc	12,800	......	40.80	9,109	......
Sale of power	19,641	......	8.10	18,128	......
Total	$112,896	0.557	19.15	$94,747	0.57
Operating revenue	$20,267,730	100.00	22.15	$16,592,679	100.00
Operating expenses:					
Way and structures	$1,233,332	6.085	5.50	$1,170,045	7.05
Equipment	1,606,497	7.926	3.90	1,545,241	9.31
Depreciation reserves	1,626,888	8.027	*1.95*	1,659,268	10.00
Power	2,198,861	10.849	28.20	1,715,604	10.34
Traffic	12,775	0.63	95.00	6,550	.04
Transportation	6,615,316	32.640	23.20	5,363,205	32.32
General miscellaneous	765,074	3.775	3.80	737,254	4.44
Injuries and damages reserves	1,216,064	6.000	22.20	995,561	6.00
Total operating expenses	$15,274,807	75.364	11.49	$13,292,728	79.50
Net operating revenue	4,992,923	24,636	47.20	3,399,951	20.50
Taxes	1,437,336	7.092	29.40	1,110,911	6.70
Income from operation	$3,555,587	17.543	55.30	$2,289,040	13.80
Non-operating income	145,855	.719	37.04	106,442	.64
Gross income	$3,701,442	18.262	54.50	$2,395 482	14.44
Deductions	2,618,014	12.917	1.62	2,661,263	16.04
Net corporate income	$1,083,428	5.345	509.00	*$265,781*	1.60

NOTE:—Figures in italics indicate deficit or decrease.

This increase in trainmen's wages cost the receiver about $2,000 a day. No increase was granted to mechanics, carpenters, electricians, printers and members of other unions, but the matter was submitted to the State Public Service Commission for arbitration. The commission held, however, it was not mandatory that they should act as arbitrators. The receiver recently filed a mandamus suit in the Missouri Supreme Court to compel the commission to act, alleging that the commission alone has the right to adjust income and expenses. A decision is expected soon.

The total number of revenue passengers carried in 1920 was 287,405,837 and transfer passengers 154,464,735, total 441,870,572, as against 409,010,329 in 1919. The percentage of revenue passengers using transfers in 1920 was 53.74, while in 1919 it was 53.29.

Direct taxes applicable to railways for 1920 were 7.09 per cent of the operating revenue. In addition to these taxes, the United Railways expended during the year $318,238 for street paving and furnished free transportation for police and firemen. The total taxes and street paving costs—$1,785,044—amounted to 0.621 cents per revenue passenger. Injuries and damages for the year entailed an expense of $1,216,064, or approximately 6 per cent of the gross revenue.

Capital expenditures made during the year included $60,555 for way and structures, and $448,554 for equipment, a total of $509,109, the largest items of which were $303,292 for revenue cars and $129,551 for new electric equipment for old cars. During the year 0.1253 miles of track were added, and 0.9828 removed. Track reconstruction totaled 26.50 miles. The total mileage of the system now is, in single tracks, 345.20 of city lines, and 115.52 of county lines, a total of 460.72 miles.

Power for the year costs $2,198,861, or at the rate of 13.5 mills per kw.-hr. at the d.c. switchboard. On a kilowatt-hour basis 59.4 per cent of the average distribution of power was from purchased water power, 27.6 per cent from purchased steam power, and but 13 per cent generated by the company in its own plants. On the peak loads the basis was 40.8, 25.6 and 33.6 per cent respectively.

The average number of passenger cars operated daily, including Sundays, during 1920, was 1,175, as compared with 1,132 in 1919 and 1,107 in 1918. During the peak hours in some weekdays the number was as high as 1,320.

Reorganization Plan Being Arranged

Reorganization of the Pittsburgh (Pa.) Railways and elimination of the receivership may be effected within the next three months, according to an announcement by Mayor E. V. Babcock, following a conference with other city officials, President A. W. Thompson and chief counsel for the Philadelphia Company.

President Thompson outlined his reorganization plan but no details were made public pending the presentation of the plan to the City Council.

Louisville Results Disappointing

James P. Barnes, president of the Louisville (Ky.) Railway, made public on May 5 figures showing that the 40 per cent increase in fares by the company had resulted in an increase in earnings of only 7.49 per cent in the month of April.

In round figures, Mr. Barnes' report shows the gross revenue for the first four months of the year to be 5.09 per cent more than it was for the first four months of last year. For the two months and seven days the 7-cent fare has been in effect the earnings have been 8.56 per cent more than the same period last year. During April just past, the receipts from fares were $355,085, an increase of $25,781 or 7.49 per cent over April, 1920.

Mr. Barnes said he hoped the percentage would be increased and believed it would be as people became more used to the 7-cent fare, but that while the company was not discouraged by results to date, the increase in revenue under the higher fare had not been as great as was anticipated.

Samuel Riddle, vice-president, said he was confident fewer persons were riding in jitneys than there were a month ago. He believed the jitneys would gradually withdraw from service owing to the cost of maintenance and inability to run on regular time schedules at 5 cents.

The 7-cent fare went into effect in Louisville on Feb. 21.

Deficit of $142,030 in Cincinnati in Four Months

Figures of the monthly report of the Cincinnati (Ohio) Traction Company for April filed with William Jerome Kuertz, Director of Street Railways, when compared with other monthly reports since January, show that although there is a deficit on hand at the end of each month, the deficits are being cut down gradually. This is with exception of the month of February, when the deficit was the largest of the year to date.

During the month of April the gross receipts from all sources totaled $775,952. The gross expenses were $806,202, leaving a deficit for the month of $30,249.

The number of fares collected during the month shows a decrease of 1,103,332, for the number collected during April, 1920. Mr. Kuertz believes that economic conditions combined with high fare are responsible for the falling off in the business of the company as compared with last year. The report states that the cost of service in April was 8.95 cents per revenue passenger, while the income was 8.61 per revenue passenger.

The total accrued deficit of the traction company to date, according to its claims, is $806,426. The city of Cincinnati dispute these figures pending a decision by the courts on their contentions that the company allowed the Ohio Traction Company and the Cincinnati Car Company to earn large profits at its expense.

The accrued deficit up to Jan. 1, 1921, which had accumulated since a former deficiency was funded under a refinancing plan, amounted to $664,395. The monthly record since then, as claimed by the company, has been as follows: January earnings, $782,921; expenses, $814,113; deficit, $31,192. February earnings, $707,502; expenses, $755,497; deficit, $47,994. March earnings, $796,418; expenses, $829,014; deficit, $32,595. April earnings, $775,952; expenses, $806,202; deficit, $30,249.

Commerce Body Would Explain Refinancing to Public

In order that the citizens of Cincinnati may have an opportunity fully to understand the provisions of the proposed refinancing of the Cincinnati (Ohio) Traction Company and the Ohio Traction Company, as being formulated, the executive committee of the Chamber of Commerce has asked Mayor John Galvin that when the plan is completed it be submitted to the Chamber of Commerce as the representative of the general public, for its consideration, before final action is taken.

Interborough Loses $877,000 in Three Months

The income statement of the Interborough Rapid Transit Company, New York, N. Y., for the three months of the current year and for the nine months ended March 31 are shown in the accompanying tables. In the month of March more revenue traffic was handled than in either January or February. Although the net income for the month shows a deficit of $187,743, it is a better showing than was made in the two preceding months. The net corporate income for the nine months ended March 31, 1921, failed by $3,560,140 to meet the cost of service, this against a deficit of $1,994,780 for the corresponding period of a year ago. Since Dec. 31, 1920, the termination of the six months' period through March 31 the end of the nine months period the Interborough's deficit has increased $877,379.

Nine months ended March 31:	1921	1920	Per Cent Change
Gross operating revenue	$41,189,134	$37,989,848	8.4
Operating expenses	27,211,821	23,503,599	15.8
Net operating revenue	$13,977,313	$14,486,249	*3.5*
Total taxes	2,028,258	1,958,899	3.6
Income from operation	$11,949,055	$12,527,350	*4.6*
Non-operating income	472,881	422,848	11.9
Gross income	$12,421,936	$12,950,198	*4.1*
Interest, rentals, etc., including Manhattan Guarantee	15,982,076	14,944,978	6.9
Net Corporate income (exclusive of accruals under the provisions of Contract No. 3 and related Certificates which under these agreements with the City are payable from future earnings)	*$3,560,140*	*$1,994,780*	78.5
Operating per cent	66.0	61.8	4.2
Passengers carried (revenue)	756,977,274	702,981,440	7.7

STATEMENT OF EARNINGS—INTERBOROUGH RAPID TRANSIT COMPANY

Month Ended	March 1921	March 1920	March Per Cent Change	Feb. 1921	Feb. 1920	Feb. Per Cent Change	Jan. 1921	Jan. 1920	Jan. Per Cent Change
Gross operating revenue	$4,933,632	$4,876,561	1.2	$4,345,109	$4,468,923	*2.8*	$4,940,995	$4,444,137	11.2
Operating expenses	3,147,783	2,829,713	11.3	2,839,513	2,643,978	7.4	3,190,225	2,854,687	11.8
Net operating revenue	$1,785,848	$2,046,848	*12.8*	$1,505,596	$1,824,944	*17.5*	$1,750,770	$1,589,450	10.2
Total taxes	244,544	228,812	6.9	230,790	215,931	6.9	241,654	216,638	11.6
Income from operation	$1,541,304	$1,818,035	*15.2*	$1,274,805	$1,609,013	*20.8*	$1,509,116	$1,372,811	9.9
Non-operating income	51,892	50,426	2.9	50,613	49,446	2.4	54,122	51,046	6.0
Gross income	$1,593,196	$1,868,462	*14.7*	$1,325,418	$1,658,460	*20.1*	$1,563,238	$1,423,857	9.8
Interest, rentals, etc., including Manhattan Guarantee	1,780,940	1,674,975	6.3	1,789,213	1,673,620	6.9	1,789,079	1,676,596	6.7
Net corporate income (exclusive of accruals under the provisions of Contract No. 3 and related certificate, which under these agreements with the city are payable from future earnings)	*$187,743*	$193,486	*197.0*	*$463,796*	*$15,160*	*2,958.0*	*$225,841*	*$252,738*	10.6
Operating ratio	63.8	58.0	5.8	65.4	59.2	6.2	64.6	64.2	0.4
Passengers carried (revenue)	91,727,683	91,297,336	0.5	80,092,357	84,193,107	*4.9*	88,561,712	82,094,063	7.9

Commission Urged to Indicate Valuation Procedure

The city of Minneapolis, Minn., is very anxious that the Minneapolis (Minn.) Street Railway proceed with extensions and with reconstruction on account of paving. It is impossible for the company to attempt this work, however, without being able to stabilize financing, not only for this year but for some years in advance, in order to lay out a constructive program which will properly serve the public. For this reason it has appealed to the State Railroad & Warehouse Commission, under the recently amended law, to "advise us in what form to make application to your honorable body to undertake as soon as possible the valuation of our property that you may be able to authorize the issuance of securities which we can market to secure the money for the improvements which are being called for."

The company explains that it does not wish to press this matter too strongly, but that it does wish to have it understood that "the public improvements which are demanded are dependent upon your action in the matter."

The same request for information was made for the St. Paul City Railway, while the Duluth Street Railway requested an emergency fare of 7 cents with four tickets for 25 cents.

Foreclosure Sale of Providence Roads Ordered

Decrees for the foreclosure sale of the properties of the United Traction & Electric Company, the Rhode Island Suburban Railway, the Pawtuxet Valley Electric Street Railway, and the Cumberland Street Railway, Providence, R. I., because of the default in payment of principal and interest on the bonds, have been entered in the Superior Court at Providence by Presiding Justice Tanner.

The court appointed Arthur A. Thomas as special master in chancery to conduct the sale at such time as Mr. Thomas may hereafter announce and after six weeks' advertised notice. The roads will then probably be purchased by the joint reorganization committee for the United Electric Railway.

The decrees were entered by the court following a hearing upon the complaint of the Central Union Trust Company, New York, trustee, against the United Traction & Electric Company, and the consolidated cases of the Union Trust Company, trustee, against the Rhode Island Suburban Railway, Central Union Trust Company, New York, trustee, against the Pawtuxet Valley Electric Street Railway and the Central Union Trust Company, New York, trustee, against the Cumberland Street Railway.

The special master will put up the property in separate parts and get bids. If the sum of the highest bids for the properties separately is less than the sum offered for the three together, they will be sold together and the purchase price apportioned as provided by the decree.

Notice has also been given that the plan and agreement of reorganization of the system, referred to at length previously in the ELECTRIC RAILWAY JOURNNAL were declared operative, with respect to all the classes of securities previously mentioned, on April 23, 1921.

Merger Reported Arranged

The Capital Traction Company and the Washington Railway & Electric Company, Washington, D. C., have agreed on a plan of merger, the Public Utility Commissioners of the district announced on May 18. The details are withheld.

Court Orders Seizure of Equipment Not Paid For

Judge Martin J. Wade of the Federal court at Des Moines, Iowa, on May 13 granted an order to the General Electric Company authorizing it to seize certain equipment in the three substations and power plant of the Des Moines City Railway.

The order was to satisfy claims of the General Electric Company for equipment valued at about $68,000, which had been furnished largely for installation in the substations of the railway during the past few years. The financial condition of the railway has not permitted it to pay for the equipment. As a last resort the General Electric Company brought suit in the Federal court a few weeks ago. The order made on May 13 is the result.

F. C. Chambers, operating receiver for the railway, was in Chicago consulting with the Harris interests, owners of the Des Moines plant, at the time the order was made public, and there has been no definite announcement from the company as to just what effect the carrying out of the order would have on service.

Over the long distance telephone, however, A. W. Harris told a Des Moines newspaper that he would refuse to put another dollar into the Des Moines plant until the city and company had arrived at an agreement by which the people of Des Moines would meet the situation.

Announcement was made that the General Electric Company would start removing its equipment from the substations May 16.

In the meantime arbiters representing the railway and the union employees are deadlocked over the choice of a third arbiter. A week ago the company named B. F. Elbert, a Des Moines theater owner, as its arbiter, while Rev. J. E. Kirbye, who was the third arbiter in the last arbitration over the wage scale, was chosen by the union. Many names have been advanced for the third man without an agreement being reached.

The present working agreement between the company and men expired on March 1.

Financial News Notes

Tax Measure Excludes Electric Railways.—The King tax bill, which was recently passed by the California Legislature, as noted in the ELECTRIC RAILWAY JOURNAL, issue of March 19, page 570, does not change the rate of taxation imposed on electric railways of the state.

Bonds of Interurban Road Paid.—The $855,000 of first mortgage bonds of the Detroit & Northwestern Railway, Detroit, Mich., included in the system of the Detroit United Lines, which matured on May 1, 1921, were taken up from the present holders upon presentation to the Central Union Trust Company, New York.

Ten-Cent Fare Unremunerative. — The receipts of the Worcester (Mass.) Consolidated Street Railway were $8,230 less for April, 1921, than for the month of April, 1920, when the road operated under a 7-cent fare plan. According to General Manager Henry C. Page it was only because of the present business depression that receipts fell off.

May Buy Railway Property.—It is said that negotiations have been under way for the sale of the Gadsden, Bellevue & Lookout Mountain Railway by the Alabama Power Company which operates the city railway system in Gadsden. The Mountain Railway, as it is called, connects Gadsden and Noccalula Falls. It is expected that if controlled by the Alabama Power Company a park movement in the vicinity of the Falls will be fostered.

Service Resumed at Holyoke.—Service on the Holyoke (Mass.) Street Railways lines between Chicopee Falls and Holyoke, suspended thirty-seven days ago because of jitney competition, was resumed on May 4 following action of the Holyoke Board of Aldermen in banning jitneys from that city. The railway refused to operate its cars in competition with the buses and the Chicopee Aldermen refused to revoke permits. The controversy has been settled by the action of the Holyoke Aldermen.

Receiver for Shuttle Line.—George C. Dunlap has been appointed receiver of the Dallas (Tex.) Standard Traction Company, owner of the Mt. Auburn-Parkview line in an order signed by Judge W. S. Whitehurst. Judge Whitehurst's order further restrained the sale of the property by the sheriff on May 3, as was ordered in a previous judgment. The Dallas Standard Traction Company controls a shuttle line in the city of Dallas about 1½ miles long which was operated under lease by the Dallas Railway until May 1, when the contract between the companies expired.

Traffic and Transportation

Knoxville Decision Expected

Rumor Says Seven-Cent Fare Will Be Granted but Transfer Charge Refused

With the appraisal figures fixed and arguments heard as to the merits of the petition for higher fare, the Tennessee Public Utilities Commission is expected to render a decision within the next ten days as to whether the Knoxville Railway & Light Company of Knoxville, Tenn., may charge a 7-cent fare, with 2 cents additional for transfers, or whether the fare shall remain as it is, 5 cents.

The commission rendered a compromise decision on the appraisal of the property of the company, fixing the valuation at $5,983,000. Upon this valuation the commission will hold as to whether or not the company is entitled to a higher fare.

The appraisal of the property followed an order made by the state commission on May 21, 1920, following an application by the traction company for an increase in fare. The appraisal was concurred in by the valuation expert for the traction company. The two men fixed the valuation of the property at $6,234,141, on an historical basis, including superseded property. Of this amount the traction department was valued at $4,203,247 and the commercial lighting department was appraised at $2,030,894.

On a reproduction cost basis, using prices for the first six months of 1920, it was found by the appraisers representing the commission and the company that the value of the property would be $10,362,964.

The engineer representing the city of Knoxville, which is fighting the increase, demurred from the finding of the other two appraisers and refused to sign the majority report. He held that the property value was approximately $2,000,000 under the majority report.

Attorneys for the city of Knoxville have announced that they propose to carry the matter to a higher authority in the event the decision is against them.

Indications were on May 16, although without official authority, that the commission will grant the 7-cent fare requested, but that the request for 2 cents additional for each transfer will be denied.

Another Auxiliary Auto Service

The Holyoke (Mass.) Street Railway, through its president, L. D. Pellissier, has applied for permission from the Aldermen to run autos on the so-called West Dwight Street line. The company seeks permission to run two buses with a capacity of 30 passengers each. They will be operated under the same ordinance on which the street cars are operated, which fixes a minimum period of service.

As the West Dwight Street line, if the petition is granted, will require two shifts of men, and as union men will be employed upon it, the jitneys will be operated at both earlier and at later hours than under the old system. An attempt will also be made so to arrange the time of their running as to stagger the service and greatly increase accommodations from down town to Pleasant Street, West Dwight Street and adjacent sections.

Court Asked to Reopen Galveston Fare Case

The fare case at Galveston, Tex., has been reopened in federal court, and another legal contest is in prospect. This case was recently decided by Judge J. C. Hutcheson of the United States Court for the Southern District of Texas at Houston in a ruling adverse to the railway, when the court held the earnings of the Galveston Electric Company under a 5-cent fare were adequate and declined to permit an increase in rates.

Following arguments on a motion for rehearing Judge Hutcheson announced that he would appoint a special engineer to investigate costs of maintenance and depreciation, unless opposing counsel can agree on certain points involving these questions. Judge Hutcheson intimated that if appointment of such an engineer became necessary, he would be representative of the court and not of either of the parties to the litigation.

Judge Hutcheson's decision holding that the earnings of the company under the present fare charges are adequate was made after a special master in chancery had conducted hearings and had investigated fully the questions of maintenance costs, depreciation, valuation, etc. Judge Hutcheson, however, held adversely to the findings of the special master, Judge Henry J. Dannenbaum, Houston, who found, according to his report, that the Galveston Electric Company can not make a fair and just return on its investment with fares at 5 cents.

The new developments in the case in the motion for rehearing, on the ground that additional evidence is to be presented, is regarded as assuring a reopening of the case. The motion for rehearing, filed by attorneys for the company, alleges that the court erred in deciding against the company on grade raising, depreciation, brokerage, going-concern value, and the court's treatment of operating expenses and maintenance.

Seven-Cent Fare Voted Down in Port Huron

The electors of the city of Port Huron, Mich., voted down the proposition of the Detroit United Railway to increase fares on the Port Huron city lines, which are part of the Detroit United System, from 5 cents to 7 cents, at the April 4 election. The company's proposal was defeated by a vote of 3,200 to 2,026.

As a result of the failure of the proposed increase to carry, wage reductions affecting the employees of these lines were announced by the company to become effective on May 1. The new wage scale proposed by the company calls for rates 2 cents an hour less than the proposed scale for Detroit employees, or 53, 56 and 58 cents an hour.

The State Railroad Commission did not have jurisdiction in the Port Huron case. The proposed increase of fares there would have amounted to a suspension of franchise rights similar to the case when the Detroit City Council granted the company an increase of fares in Detroit even though the rate was fixed at less in the franchise agreements. In the case of the Port Huron Council, the city officials simply refused to act and put the matter of the increased fare up to the voters in referendum. No further action has been taken by the company in as much as the decreased scale of wages on the Port Huron lines went into effect on May 1.

Application for Eight-Cent Fare Dismissed

The Corporation Commission of North Carolina has, upon motion of the Asheville Power & Light Company, Asheville, N. C., dismissed the application of that company for an 8-cent fare in the city of Asheville. In asking for the dismissal of the 8-cent fare case the company applied for authority to increase its gas rates and a date has been set for a hearing on this last application.

It is understood that the action of the company in respect to the railway fare was influenced very largely by conditions prevailing on its gas property, where the need of improvements was great and the earnings from the present gas rates were insufficient to justify additional expenditures. Faced with the necessity of increasing its gas rates in order to furnish adequate service the company was disinclined to inaugurate both higher gas rates and railway fares at the same time, and therefore decided to ask for the dismissal of the railway application with the idea of adhering to the present 6-cent fare if future conditions make this possible.

While the present 6-cent fare is said not to yield a fair return upon the value of the property it is the intention of the company to give this a further trial in the hope that, Asheville being a resort city, the approaching tourist season will bring with it sufficient business to justify the action taken.

Increase Disappointing

Indianapolis Roads Willing to Assume $1,000,000 Construction Cost for Freight Terminal

Joseph A. McGowan, treasurer of the Indianapolis (Ind.) Street Railway, and attorneys for the company, who appeared before the Indiana Public Service Commission on May 12 concerning the 6-cent fare and 1-cent transfer charge, filed with the commission a document that shows that the four big interurban companies that enter Indianapolis are willing to assume the cost of constructing the $1,000,000 freight terminal which is proposed on Kentucky Avenue.

FINANCING A PROBLEM

At the present time the officials of the Union Traction Company, the Terre Haute, Indianapolis & Eastern, the Interstate Public Service Company and the Indianapolis & Cincinnati Traction Company are concerning themselves with financing the proposition. In the meantime plans for the construction are progressing with the engineers. It is thought here that there will be no opposition on the part of the Public Service Commission to the proposed construction. Under existing franchises the Indianapolis Street Railway is supposed to provide the interurban companies with freight room, but officials of the interurbans know from the present earning power of the local company that it could not possibly handle such a proposition.

The first move toward the project will be the organization of a separate company as a holding company for the freight project. Stock will be issued, twice as much preferred as common. The common will be held by the four interurban companies and the preferred will be sold. It is the intention to distribute the stock over the entire State where the various interurban companies operate.

John W. McCardle, chairman of the commission, said recently the commission had not decided on the course it will follow in the case of the Indianapolis Street Railway. It may hold a supplemental hearing and issue a new order before the end of the thirty-day period. On the other hand, it may merely issue an order continuing the present fare schedule until June 1, and in the interval hold the supplemental hearing and then issue a new fare schedule order.

697,055 FEWER PASSENGERS

In response to the commission's request, officers of the railway and city officials considered with the company recently the receipts of the railway under the temporary order. The figures were compared with the receipts for the corresponding period last year. Company officers submitted that in April the company carried 697,055 fewer passengers than in April, 1920. General business depression and jitney bus competition were given as some of the reasons.

Mr. McGowan said that if the same rates of decrease prevailed through the remainder of the year the company would lose $445,000. He showed that of the 3,153,306 passengers carried in April, 1,041,491, or 31.72 per cent, paid the 6-cent cash fare, and the remaining 2,111,815 passengers bought tickets. It was estimated by some, when the commission heard the petition for the present charges, that if passenger business did not fall below that of last year and if 15 per cent of the passengers paid the extra cent, the company would obtain revenue sufficient to keep it going. The experience of the company in the trial period shows that while more than twice that percentage paid the extra 1 cent, the total number of passengers, and consequently the total revenue, fell far below that for the corresponding period last year.

Robert I. Todd, president of the company, and Ferdinand Winter, its attorney, discussed jitney bus competition. George M. Bernard, a member of the commission, requested the officers to produce at the supplemental hearing figures to show the injury done to the company by the jitneys.

Arthur W. Brady, president of the Union Traction Company of Indiana, and Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, filed a petition with the commission requesting approval of a freight terminal arrangement between the city railway and the interurbans using city tracks. The arrangements were made public some time ago. The interurbans request authority to make a special terminal charge of 3 cents a 100 lb. for freight and express.

City After Detroit United Again

Steps leading to the possible reduction of Detroit city fares to 5 cents have been taken by the city officials. A resolution prepared by Councilman Watson directs the Corporation Counsel to advise the Council relative to the proper legal step to take to have the fare lowered. The company has been asked to submit operating figures so that the city can determine whether or not the reductions in the wages of platform employees will allow a reduction in fares.

The fare on Detroit city lines was increased to 6 cents with nine tickets for 50 cents last June by an agreement between the company and the city. The city officials maintain that the increased revenue provided for by the increased fares was to be used to pay increases to motormen and conductors only. The company maintains that other employees were included.

According to the figures of the city's accountants who have audited the company's books in accordance with the agreement when the increased fare was granted, a surplus income had been accumulated up to the end of February, due to the increased fares, in excess of the amount required to pay increases to all employees.

Omaha Hearing Begun

Deficit Under Temporary Seven-Cent Operation—Valuation Figures Presented

The hearing on the application of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for a permanent rate, before the State Railway Commission, was scheduled to begin in the Omaha City Council chamber on May 16. The company is not asking for any specific rate of fare, but demands a rate that will yield a reasonable return on its investment.

The commission issued a temporary rate order effective on Aug. 10, 1919, allowing the company to charge 7 cents for cash fares, with a four-for-a-quarter ticket privilege. In connection with that order the company was directed to file with the commission a physical valuation report. This has just been done.

A copy of this valuation report was handed to W. C. Lambert, corporation counsel, who will represent the city at the hearing. In this report the company sets up the following valuation figures: Reproduction cost new of physical property, based on a four-year average to 1919, $17,316,833; on 1919 basis, $19,671,741; allowing for depreciation, as of 1919, $17,890,765. The following valuation totals include organization and legal expenses, interest and taxes and going value: Reproduction cost new on a four-year average, $21,740,254; for 1919, $25,126,177; allowing for depreciation, as of 1919, $23,291,772.

The company's gross earnings from operations in 1920 were $4,807,529. A deficit of $81,586 is shown for that year. Interest on bonds paid last year, $479,212; taxes, $427,861; 6¼ per cent dividends on preferred stock, $250,000. No dividends were paid on the common stock during 1920. The report further shows a surplus of $16,829, for 1919. The total number of passengers carried during 1919 was 70,151,302, and during 1920, 72,033,229. The property account shows 1,142 motors, 119 miles of main track and 2 miles of leased track.

Court Sustains Denial of Ten-Cent Fare

The Jersey Central Traction Company failed to comply with an order of the Board of Public Utility Commissioners that it provide "proper and safe" service for its patrons. This is the conclusion of Justice Kalisch in an opinion filed in the New Jersey Supreme Court on May 5 in which the court affirmed a decision of the Utility Commission denying an application for permission to establish a 10-cent fare. The company operates in Perth Amboy, South Amboy, Sayreville, Matawan, Keyport, Keansburg, Red Bank, Atlantic Highlands and other municipalities in Middlesex and Monmouth counties. In 1918 the company charged 5 cents in each fare zone, but war conditions prompted the Utility Commission to advance rates to 7 cents. A further increase to 10 cents was sought in an application to the commission in April, 1920, but the company failed to comply with an order to improve service and the plea was denied. It then appealed to the courts. Justice Swayze in the lower court in sustaining the decision by the Utility Commission, said that the evidence showed the service to be insufficient, inadequate and unsafe.

Hearing on Fort Wayne Fares

At a hearing conducted by the Indiana Public Service Commission at Fort Wayne, on the request of the city of Fort Wayne that the Indiana Service Corporation be forced to reduce the price of city fares from 7 cents cash and four tickets for a quarter, it developed that the company's business is 20 per cent less than what it was last year at this time.

The city attorney claimed that more cars are now being operated than are necessary and that if the number of cars operated was reduced the fare could be decreased. The local federation of labor sent a letter to the commission asking that five tickets be sold for a quarter and that the cash fare be adjusted to 8, 9 or 10 cents or whatever figure was necessaray to get the required revenue.

Previous to the hearing the company published a large advertisement in the local newspapers which read in part as follows:

> The record of the operating expenses and revenues of the company which were checked by both the city and state accountants during investigations for the past four years, show that the following return was earned on the investment of the company: 1917, 1.38 per cent; 1918, 0.83 per cent; 1919, 2.92 per cent; 1920, 7.27 per cent; average for four years 3.3 per cent.
>
> After taking away bond interest from the investors for almost three years and pouring it back into the property for new cars and track improvements, the company during 1920 was able to earn 7.27 per cent. But remember that a public utility company is not like the ordinary industrial corporation which has a chance to build up a surplus from revenues during prosperous times to carry it over the bad years.
>
> This company has earned far less than a fair return for the past four years and even at the present time is not earning 8 per cent, which is the minimum cost of public utility money. Remember even city bonds are selling to yield 6 per cent.
>
> The company believes that its patrons in Fort Wayne want real service first and that they are willing to pay the fair cost of this service. No one has contested the fact that the company is trying to give real service and pay decent wages.
>
> The company is just as anxious to reduce fares as is the rest of the community to have it do so, but they know that fares cannot be reduced without materially curtailing the service. Fares were not raised as early as they should have been and the 5-cent fare and the six-for-a-quarter ticket was not a self-supporting fare at any time during the past ten or twelve years.
>
> The company believes that a well maintained street railway giving real service is what the patrons want in Fort Wayne. You can have whatever kind of service you are willing to pay for.

The matter of equipment betterments was gone into extensively. Mr. Feustel stated that while it appeared that the company was doing a great deal of repair and construction work, in reality less was being done than was necessary to keep the plant and tracks in good repair and he stated that the increase of 70 per cent in the cost of construction made the figures look large.

Utility Commissions' Joint Attack on Wheeling Ruling

Formal attack on the decision of the Interstate Commerce Commission authorizing the Wheeling (W. Va.) Traction Company, operating an electric interurban railway in Ohio and West Virginia, to advance intrastate passenger fares in Ohio to its interstate level of rates was made on May 8 by the National Association of Railway & Utility Commissioners in a motion filed with the Interstate Commerce Commission asking a rehearing of the case and permission to intervene therein.

In the motion the National Association said in part:

> The several state railroad and public utilities commissions, on behalf of which this motion is filed, are interested in this proceeding by reason of their desire to preserve their jurisdiction to serve the people of their states in the manner provided by their laws. If the order of the commission in this case shall stand, and if this commission shall exercise, or attempt to exercise, power to make like orders in other cases falling within the precedent thereby etablished, said commissions will be largely deprived of their jurisdiction over street railroads, or will be compelled to engage in a multiplicity of suits to defend the same.
>
> The purpose of this motion is to secure a review by this commission of the order which has been made herein, and of the findings of fact and rulings of law upon which said order rests, to the end that said order may be set aside, and this proceeding disposed of without encroachment upon the regulatory jurisdiction and power of the State of Ohio, exercised through the commission and the municipalities of that state.
>
> There is no disguise of the fact that this is a carrier proceeding, designed to bring about an increase of intrastate fares for the purpose of producing larger revenue for the Traction Company, regarded as an interstate carrier. The record was made upon the theory that rates which the commission deems unreasonably low may be found discriminatory against interstate commerce. The case was presented to the commission upon that theory, and decided on that theory. There is no evidence of discrimination of any other sort.
>
> We maintain that this commission ought to rule that Congress has conferred upon it power of supervision over street railroad rates practically by stealth, without mention of the class of carriers over which such enlarged jurisdiction was to be created, and without mention of the purpose designed in any of the proceedings which attended the passage of the act held to effect such enlargement.
>
> We point out that when the transportation act was under consideration the representatives of electric railroads stated that they did not wish to come under it. Nobody urged any extension of rate making power as to them. The commission requested only that if interurban railroads were to be affected by the act they be clearly defined.

The decision in the Wheeling case was reviewed in the ELECTRIC RAILWAY JOURNAL for April 23, page 789.

Private Suits Against Railway Are Halted

Until the United States Circuit Court of Appeals at Cincinnati settles the Louisville fare litigation private suits seeking to restrain the Louisville Railway from charging a 7-cent fare will be denied. Judge Evans has ruled that the city is the proper defendant and can protect the rights of all people interested in defense of this action. In a suit pending in the Quarterly Court Reuben Ruthenberg, attorney, seeks to sue for himself and others similarly situated to recover from the railway the entire amount paid by patrons in fares in excess of 5 cents since the increase of 2 cents became effective. Should the final decision in the United States Court be unfavorable to the railway and Mr. Ruthenburg's motion be sustained in the Quarterly Court all those who are seeking to recover excess fare amounts will have to join in one petition. The company has been using rebate slips and the Federal Court will provide the method by which the rebates shall be made to the holders of slips so no action will be necessary in the state or county courts for a refund.

Commission Wants Cities to Indicate Desirable Jitney Routes

Suggestion that officials of cities prepare a schedule of routes desirable for jitney travel in preference to having individual jitney men make application for the right to traverse this or that route is made by the Public Utilities Commission of Connecticut through its secretary in a communication to the Manufacturers' Association of Bridgeport relative to the future status of the buses.

The communication indicates that Bridgeport will be permitted to solve its own jitney problem, and it will practically lie within the power of municipal authorities of Bridgeport to recommend what jitney service shall be continued in order to serve the people of the city. It is further indicated that New Haven officials may similarly recommend if they so desire.

The commission in this letter says that if the local authorities, who should be familiar with existing street railway service and local requirements, would lay out such routes it would materially assist the commission and have a tendency to simplify and systematize the whole situation; and further, that after establishment of routes, the individual application to operate over any such routes could be received and acted upon without involving the question of public convenience and necessity.

The letter says:

> The law specifically requires that a public hearing be given on each application for a certificate to operate a jitney and that no such certificate be given without a finding of public convenience and necessity. The law is not specific, however, as to the hearing and finding on public convenience and necessity as to the particular route or manner of establishment other than the implication that such finding be determined in each individual case. In the absence of having established any positive mode of procedure the foregoing is submitted informally as a suggestion which at this time seems the most practical course to pursue as applicable to the city of Bridgeport and vicinity. In view of the large amount of work involved all over the State in this matter it is the desire of the commission to start proceedings as early as can be conveniently arranged. The commission is having prepared a form of application for certificate to operate a jitney and same will be ready in a few days.
>
> The commission adds that it has no form for establishment or travel of routes but the same may be informal and submitted to the commission, specifying the routes and asking for a hearing and finding as to public convenience and necessity.

The jitneys were brought under the jurisdiction of the commission effective July 1 as to their convenience and necessity at the present session of the Legislature.

Transportation News Notes

Niagara Fare Advanced.—The International Railway, Buffalo, N. Y., under a joint tariff covering passenger traffic with the Niagara Gorge Railroad, effective on May 1, increased the Buffalo-Lewiston fare one way via the Falls 13 cents. The round-trip will be increased 11 cents. The Buffalo-Youngstown fare one way will be advanced 8 cents and round trip 5 cents.

Decrease in Passengers Carried.—Industrial depression and the unrestricted operation of jitneys until April are given as the reasons for the alarming decrease in traffic on the Youngstown (Ohio) Municipal Railway. In March, 1921, there was a falling off of 50,000 passengers over the previous month and about 500,000 over the corresponding month of a year ago.

Reduced Fare in Dubuque.—A reduced fare rate has recently been put into effect in Dubuque by the Dubuque (Ia.) Electric Company as part of a readjustment measure which included wage reductions. Instead of seven tickets for 50 cents formerly sold, eight tickets for 50 cents are now for sale, with the cash fare of 8 cents remaining unchanged. The increase in fares was made just a year ago.

Petitions for Seven-Cent Fare.—The Virginia Railway & Power Company, Richmond, Va., has petitioned the City Council for a 7-cent fare with the withdrawal of all labor tickets. The company is at present operating on an amended franchise fixing the fare at 6 cents. The franchise expires on Aug. 1. The petition asks that the existing franchise be amended so that the fare of 7 cents may be charged for twelve months.

Emergency Rate Asked.—The Duluth (Minn.) Street Railway has filed a petition with the State Railroad & Warehouse Commission for an emergency fare of 7 cents. The present rate is 5 cents. The increase will be asked for under a provision passed by the last state legislature which permits the commission to grant an emergency rate pending a valuation of the property. The company was unsuccessful in obtaining an increased rate from the city.

Petitions for Decrease.—The Muskogee (Okla.) Electric Traction Company recently petitioned the State Corporation Commission to put into effect a reduction of fares between points in the city of Muskogee and Hyde Park to 10 cents during the park season. The commission granted the request, stating that it was to the interest of both the public and the traction company to make the fare between these points as reasonable as possible during the summer months.

Fare Injunction Refused. — An injunction against the Cincinnati (Ohio) scale of fares has been refused the residents of Lockland and Wyoming by the Hamilton County Court of Appeals. This decision affirmed the lower court. Residents claimed that under a franchise to the Ohio Traction Company in 1900 the road agreed to carry passengers between those villages and the Zoo for 5 cents, and they sought to have that franchise kept in force. The higher and lower courts agreed that since the city owned the streets it has the right to fix the fares to be charged passengers using them for car rides.

Safety Campaign in Massachusetts.—Brigadier-General Leroy R. Sweetser, Commissioner of Labor and Industries of the Commonwealth of Massachusetts, has appointed two special safety committees, consisting of five well-known street railway men and five steam railroad men, to promote safety methods and reduce accidents among employees of the Massachusetts transportation system. The specific work laid out for these committees is to co-ordinate safety work among the various transportation agencies, adopt standard rules and regulations, and to publish bulletins for the guidance of the various properties. The street railway branch of this committee consists of H. B. Potter, Boston Elevated, chairman; G. W. Mitchell, Eastern Massachusetts Street Railway; H. R. Whitney, Springfield Street Railway; G. H. McFee, Boston & Worcester, and Chester P. Rexford of the Union Street Railway.

Receipts Barely Meet Costs in London.—In May, 1920, the Ontario Railway & Municipal Board took over the operation of the London (Ont.) Street Railway during a third strike of the employees for higher wages. The company sells nine limited and seven unlimited tickets for 25 cents under a franchise secured in 1895, and all efforts of the railway to have the fares increased to meet the present-day conditions have failed. A year ago the citizens voted down a proposed increase. Now Vice-Chairman A. B. Ingram, of the Ontario Railway & Municipal Board, announces that the receipts are barely sufficient to meet the costs of operation and the prospects for the ensuing year are rather dark. The employees have dropped their demands for more money, but the railway board finds it impossible with the existent fares to pay for the company's share of paving on streets traversed by its lines under the existing agreement with the city.

Eight Cents in Oneonta.—The Southern New York Power Corporation, operating in Oneonta, N. Y., has been authorized by the Public Service Commission, Second District, to charge for a year from April 20, and thereafter until changed by order of the commission, an 8-cent fare in place of the present 7-cent fare in the Oneonta urban zone, with seven tickets for 50 cents. Tickets need not be sold on cars if placed on sale at the company's office and at least three other accessible places in Oneonta. The company asked for a 10-cent fare. In reviewing the evidence the commissioner says the company has made out a case showing the need of a 10-cent fare but the experience of the commission shows that the imposition of such a fare may result in a decreased patronage, which would offset any advantage in amount. Even with the highest fare suggested, he says, it is apparent it will not yield the company a fair return. The fare on the "owl" cars, however, is made 10 cents.

People Must Decide on Jitney or Railway.—The City Commission of Bay City, Mich., recently received a communication from the manager of the Saginaw-Bay City Railway operating in Bay City to the effect that either the jitney or the electric railway must go as both cannot survive. He declared that traffic in the city did not warrant two systems of transportation and the increasing jitney competition had rendered successful operation of the electric property practically impossible. Some conclusive evidence was submitted showing how far behind Bay City was in the matter of railway traffic and revenue compared with other cities of a similar class. During 1920 4,099,419 revenue passengers were carried as compared with 6,291,801 in Saginaw, 7,133,370 in Lansing and 7,265,884 in Jackson, though street car service and car-hours traveled were practically the same for Bay City as for other cities of the same class. The company operated at a loss of $2,600 in January, $6,800 in February and $5,800 in March. The City Commissioners want the matter referred to the Public Service Commission.

Relief Sought for Railway.—Operation of jitneys in Houston, Tex., is costing the Houston Electric Company, which owns and operates the electric railway in that city, an average of $20,000 a month, according to representations made by W. E. Wood, vice-president and general manager, before the board of city commissioners. If the heavy drain made by the jitneys on the company's revenue continues, Mr. Wood informed the City Commission, the traction company can not carry out the proposed improvement program calling for an expenditure of $450,000. The records show that licenses for 200 jitneys have been issued and it is estimated that practically the entire number are now in operation. The City Commission has no authority to revoke licenses of jitney operators, but an ordinance is now being prepared giving the commission such authority, and its passage seems assured. It is probable that some action will be taken to afford some relief for the traction company. Jitney warfare has been going on now for some time in Houston. The situation became complicated several weeks back when the railway made the removal of its tracks from Main Street contingent on the abolishing of the jitney.

Personal Mention

Mr. Scott Advanced

Long Practical Experience in Hartford Well Fits Him to Manage That Connecticut Company Division

Nathaniel J. Scott has been appointed manager of the Hartford Division of the Connecticut Company to succeed the late Warren P. Bristol. Mr. Scott has been employed by the company in Hartford and vicinity for twenty-five years and for some time has been filling the position of assistant manager. In the appointment of Mr. Scott to this position is recognized the choice of an executive trained for the responsibility in the school of practical experience and first-hand contact with the problems of trolley management.

N. J. SCOTT

In the Connecticut Company's announcement of the appointment of Mr. Scott, it is indicated that the powers of local managers have been broadened, as was suggested recently in a special report to the Connecticut Public Utilities Commission. It says:

> The managers of the various divisions of the Connecticut Company are charged with sole responsibility for the operation of their respective divisions, and are responsible for all matters pertaining to the service and upkeep of the property. They are expected to keep fully posted as to the particular needs of the various committees, and to see that in all matters the convenience of the public is assured. They have full authority to initiate such changes as in their opinion are best suited to meet the requirements of the communities which they serve.

Mr. Scott was born forty-four years ago in the Province of Quebec, Canada. His early education was acquired there and he was graduated from the Knowlton High School. Coming to Hartford shortly thereafter, he entered the employ of the Connecticut Company in July, 1896, and has been with it continuously since. He began as a conductor and spent some five years as a platform man. Later he became carhouse foreman and was successively made dispatcher and chief clerk to the manager, rising from that place to superintendent of transportation in which capacity he served for many years until his promotion came to the position of manager.

During this period of service Mr. Scott acquired a wealth of detailed knowledge of street railway conditions, particularly as they pertain to Hartford. His familiarity with the local problems of the company's system contributes in large measure to the qualifications which earned his promotion. He is held in high esteem by all his colleagues, and his long association with the Hartford office has contributed to the best of friendly relationships.

Pioneer Railroad Builder Retires

William Hood, chief engineer of the Southern Pacific Company and one of the greatest railroad engineers in the United States, retired on May 3, according to an official announcement made by President William Sproule of the Southern Pacific. George W. Doschke, formerly assistant chief engineer, has succeeded to the position. Mr. Hood left on the fifty-fourth anniversary of his first connection with the company.

Mr. Hood left the employ of the Southern Pacific Company at the age of seventy-five years, not because of failing health or because of his age, but because he desires to attack more difficult problems than are presented by the railroads in this stage of operation when no large extensions of roads are contemplated. He prefers to labor with the difficulties of new construction and development with its attendant out-of-door activities.

Ever since he went to work for the Central Pacific in 1867, Mr. Hood has been closely identified with the work of uniting the West by steel rails. In the development of the railway system with which he has been connected he has been called upon to solve the most difficult engineering problems, and some of the feats which he has accomplished will prove lasting memorials to his ability.

Mr. Hood was born in Concord, N. H., in 1846. As he was preparing for college at the age of sixteen the Civil War broke out, in which he saw service in some of the most sanguinary conflicts of the struggle. After being mustered out of service he entered Dartmouth College where he remained until 1867. Inspired by the efforts to construct a railroad through the Rockies he left college and came to Sacramento where he obtained employment with the Central Pacific. He soon became assistant engineer and in 1875 was made chief assistant engineer.

Mr. Hood has been chief engineer of the Southern Pacific since 1885. He is intimately acquainted with every portion of the system which operates over more than 11,000 miles, having traveled on foot across almost every mile of the territory later spanned by the present tracks.

Mr. Hood has saved his company a vast amount of money in construction costs by exercising true engineering skill and evolving many clever expedients to solve knotty problems.

E. F. Eicks, Auditor of Fort Wayne-Lima Line

Edward F. Eicks, who some time ago was appointed auditor of the Fort Wayne, Van Wert & Lima Traction Company, Fort Wayne, Ind., has taken charge of the accounting work of that system. His duties are separate from those of L. W. Van Bibber, auditor of the Ohio Electric Railway system, which holds and operates the former property.

E. F. EICKS

B. H. Jones is receiver of the Ohio Electric Railway system proper, while some of the other subsidiary companies have been placed under separate receivers. Such is the case of the Fort Wayne, Van Wert & Lima Traction Company, of which H. C. Paul is the receiver. It was his intention, under the general plan of receivership for the whole system, to segregate the accounts of the Fort Wayne line for operating purposes. New offices have been established at Ewing and Pearl Streets, Fort Wayne, in the building owned by the Indiana Public Service Corporation. Mr. Eicks has been placed in charge of these offices.

The receivership of the Ohio interurban system, one of the largest in the world, with its 467 miles of interurban lines and 33 miles of city lines, came several months ago as the result of a succession of unpreventable and unfortunate occurrences. The combination of high war-time costs, preceded by a tremendous property loss by flood in 1919 and followed by an ever-increasing loss of traffic from automobile competition, has precluded the possibility of meeting operating costs alone, to say nothing of allowing a return to its investors.

The latest report, under the separate management, of the interurban connecting Fort Wayne and Lima, shows an operating surplus of about $600 for the period from Jan. 26 to Feb. 28, 1921. The statement also indicates that substantial gains in earnings are being made by the other properties included in the Ohio Electric Railway receivership.

Practically all Mr. Eicks' training and experience have been along the line of cost finding and accounting, though more in connection with commercial affairs than with railways or utilities. He has handled this sort of work for branch houses of various firms for the past several years. Previous to his present appointment he was accountant for the Sherman-White Company, wholesale dealers in poultry products and owners of a large cold storage house. Mr. Eicks was a lieutenant in the 33rd Division during the war.

J. A. MacAdams has accepted the position of general manager of the Claremont (N. H.) Railway, succeeding A. C. Ralph, deceased.

J. R. Tozer, for four years power engineer of the Rutland Railway, Light & Power Company, Rutland, Vt., has resigned to accept the managership of the municipal plant at Swanton, Vt.

L. Edward Herrmann, Jersey City, general counsel for the New Jersey Board of Public Utility Commissioners, and Alfred N. Barber, secretary of the body, have been reappointed to their respective positions.

William B. Malone, the general manager for the past year of the Meridian Light & Railway Company, has left Meridian for Salina, Kan., where he will be the general manager of the Salina Light, Power & Gas Company. Mr. Malone has been succeeded as general manager by H. C. Bonner, formerly general manager of the Alliance Gas & Power Company, Alliance, Ohio.

W. O. Clure, general passenger agent for the Twin City Lines, Minneapolis, Minn., returned to his office on May 16 after an absence of several months, the result of injuries from a fall into the company's headquarters building passenger elevator shaft. The accident occurred on Labor Day. Mr. Clure has been making occasional visits to the offices for some time with the aid of crutches.

W. H. Coleman, of the Montgomery Light & Traction Company, Montgomery, Ala., succeeded on April 1 E. W. Ashmead as manager of the street car lines of the Alabama Power Company in Gadsden, Ala. Mr. Ashmead has been promoted to the commercial department of the Alabama Power Company at Birmingham. Mr. Coleman is a practical street railway man, having served mostly in the operating department of the system in Montgomery, where he has had long and varied experience in the business.

Mr. Feiker in Washington

Hoover Selects McGraw-Hill Executive as Assistant to Develop Aids to Business

F. M. Feiker, vice-president of the McGraw-Hill Company and chairman of that company's editorial board, has been appointed assistant to the Secretary of Commerce. An indefinite leave of absence from the McGraw-Hill Company has been granted to Mr. Feiker, so that in accepting the appointment he will lose only temporarily his active connection as an official of the company.

Briefly Mr. Hoover has divided the bureaus of the Department of Commerce into two parts. Assistant Secretary Huston will supervise the bureaus relating to navigation and fisheries, while Mr. Hoover will give his personal attention to the Bureaus of Foreign and Domestic Commerce, Standards and Census. Mr. Feiker will directly assist Mr. Hoover in the expansion of these bureaus as aids to business.

F. M. FEIKER

The immediate problem is to find out by means of a series of conferences with the representative men of industry what kind of facts and figures industry needs from the Government. Having organized the department to function according to requirements, the next problem is to devise an adequate system of clearing the collected data back to business. It will be apparent at once that with Mr. Feiker's background of engineering training, viewpoint on the needs of industry and sense of publicity, he will be in a position to render unusual service in the furtherance of Mr. Hoover's plans. It is Mr. Hoover's purpose to develop the Department of Commerce so that it will have the same relation to business that the Department of Agriculture now has to farming. In other words, he feels that its function is to aid industry, not to regulate or control it. Considering his intimate knowledge of foreign conditions, his masterful grasp of economic principles, and his present official position, important results should follow.

Mr. Feiker, an electrical engineer by profession, has been especially interested in aiding Mr. Hoover in the development of his plan for the elimination of waste in industry which was undertaken by the Federated American Engineering Societies at Mr. Hoover's suggestion. Mr. Feiker is a graduate of the Worcester Polytechnic Institute, class of 1904, and for several years was chairman of the editorial board of the A. W. Shaw publications of Chicago. In 1915 he succeeded Dr. A. S. McAllister as editor of *Electrical World* and in 1919 he was appointed editorial director of all the McGraw-Hill publications. Mr. Feiker has served on a number of important committees of the National Electric Light Association and in 1920 was president of the Editorial Conference of the New York Business Publishers' Association.

John E. Zimmerman, Day & Zimmerman, Philadelphia, Pa., has been elected president of the Washington-Virginia Railway, to succeed the late Howard S. Graham. Thomas Roosevelt, also of Day & Zimmerman, has been elected vice-president, succeeding R. Golden Donaldson, who resigned, but will remain as a director and member of the executive committee.

Francis H. Miller, vice-president and superintendent of maintenance of the Louisville (Ky.) Railway, was elected president of the Louisville Rotary Club at the annual meeting of the newly elected board of directors of the organization. Mr. Miller was elected from the board of directors, which elects the president and vice-president, while the other officers are elected by the general membership.

Paul A. Lazenby, who was recently elected engineer of the newly-organized Toronto Transportation Commission, gained considerable of his experience in transportation work in the United States. He is a graduate of the civil engineering course at Massachusetts Institute of Technology in the class of 1904. Mr. Lazenby spent four years in general engineering and construction work with the Chicago, Burlington & Quincy Railroad, Deadwood, S. D. After considerable experience with other roads, in 1911 he accepted a position as associate engineer with the Chicago Plan Commission and was engaged in the preparation of a city plan and in transportation studies for that commission until 1915, when he resigned to become principal assistant engineer for the Civic Transportation Committee, Toronto, which was the forerunner of the present Transportation Commission. While with the Chicago commission Mr. Lazenby assisted in the engineering work in connection with the new Pennsylvania terminal on the west side of the city. He was also associate engineer in the preparation of city plans for Brooklyn, Minneapolis and Detroit.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Easy Deliveries Feature Rope and Cord Market

Operating Companies Not Accumulating Stocks and Buying Has Not Increased—Raw Cotton Quoted Higher

A 10 per cent decrease in the prices of trolley rope and bell cord made last month with a view toward stimulating sales has so far had little effect on the market. Operating companies are not accumulating any large stocks of this material under present conditions of prompt delivery, and until present stocks are lowered considerably it seems unlikely that buying will set in on any accelerated scale. Leading manufacturers in the east report both inquiries and sales as below normal, showing practically no change from the recent small volume of transactions. Collections are slow on sales actually made, but that is not unexpected under existing world trade conditions. Spot cotton in New York shows a slight advance to 13.05 cents since last report.

Some divergence exists among manufacturers in the matter of factory stocks and deliveries. Under present conditions of restricted buying and slow payments some refuse to maintain stocks at their plants, agreeing to make as prompt deliveries as possible on orders received. Others report fairly plentiful stocks and immediate shipments on orders. Factories are operating below their capacity, although one establishment is running about six days a week, turning out electric railway and other material.

Prompt Shipments of Safety Tread Material

Some Manufacturers Report Very Little Railroad Buying, but Others Find Demand Is Increasing Satisfactorily

Uneven conditions as regards buying are reported in the market for safety floor and step treads by manufacturers. On the one hand it is reported that very few orders are being received from either steam or electric railways just now. Some manufacturers, however, state that though sales are still below normal, they are increasing satisfactorily, and at least one producer is finding the railway market for safety tread material more active at present than at any time in the past. Large orders have been received from the Pacific Coast, it is stated, and inquiries indicating a future demand are coming from the Middle West, but the market in the East remains quiet.

Raw material stocks are reported to be large, some manufacturers carrying a heavier stock at present than at any previous period. Consequently, though it is a general policy not to stock the finished product, inasmuch as each order is made to specification, orders can be filled very quickly. In general factories are able to make up material in from one to two weeks' time. Production is naturally curtailed under present market conditions, operation as low as 50 per cent of capacity being reported.

Where labor readjustments have been made in this field, prices have been reduced about 15 per cent from the peak, but in instances where war-time wages are still maintained the slightly lower price of raw material has not yet afforded sufficient margin to warrant reducing prices. Labor cost, it is stated, is a large element in the manufacture of safety tread material, and, furthermore, the large stocks of raw material that are on hand may very possibly be a factor in the price situation.

The railroad business in this market is of course by no means the most important sales outlet, the general outlook for business depending largely upon the building construction industry. Mail inquiries and reports received from field agents, however, are said to indicate a volume of demand later on that will absorb full capacity production.

Railway Motor Production at About Thirty per Cent Capacity

Stock Delivery of Safety Car Type—Car Builders Working Off Last Year's Supply—Present Market Far Below Normal, but Producers Remain Optimistic

Sales of railway motors show considerable falling off this spring compared with last year, producers report. Buying of this class of material has been sub-normal for several years past but the present market seems especially below par. An estimate that demand this year is running about 50 per cent below normal and about 25 per cent below last year has been regarded as conservative to say the least.

Once the war had an opportunity to exert its influence in the raising of prices, sales of railway motors fell off badly. Increased cost of operation and decreased earning power of the railways kept purchases down although the advent of the safety car afforded some relief. This was reflected in sales last year which for one of the large producers increased to about three-fourths of the average yearly total of motors billed during the four-year period previous to the war. More than half of the year's bookings in this instance were made during the first three months of last year, and in comparison with this the first quarter of 1921 saw only one-seventh the same number of motors sold. Furthermore, whereas in the first quarter of 1920 nearly half the motors sold were for safety cars, in the same period this year only about 5 per cent of the total were of this type.

This would seem to indicate a decided slump in the safety car demand, but other information received is to the effect that sales of safety car equipments are still exceeding those of larger types. The reason for the apparent slump in safety car motor sales noted above is probably because virtually all car builders stocked up heavily in 1920 and are still trying to work off stocks of motors which were left on their hands. Motor manufacturers were forced to carry considerable stocks of safety car motors over into this year too, because at this time a year ago factories were running behind and production was increased accordingly. Production is now down to a level commensurate with the market and ranges from 25 per cent of capacity to 30 or 40 per cent.

Stock shipments of safety car motors are being made and reasonable shipments on those of larger capacity. Standard 40, 50 and 65-hp. sizes would probably range about 60 days. Stocks are being reduced and inasmuch as it seems to be the intention not to increase production before the last quarter, it is quite probable that all motor stocks will be considerably depleted within the next few months. Prices have come down from the peak, of course, the reduction in a representative instance amounting to 10 per cent during the past few weeks. Unless there are further decreases in labor and material cost no further price reductions are foreseen, especially while the necessarily curtailed production entails a high overhead.

The outlook for business, producers report, while not good in the immediate future, is such as to induce an optimistic view of the situation. Notwithstanding business depression, it is stated, the market looks promising due to labor reductions and increased revenue over last year on electric railways, and an easier money market. Almost every line in the country badly needs equipment and the view is expressed that railways can not hold off purchasing much longer. Consequently, a slow but gradual increase in business each month is expected.

Rush Orders Feeling Pinch of Deliveries

Policy of Manufacturers in Not Stocking Delays Delivery of Material Needed in Detroit

In connection with the tremendous construction program which is under way in Detroit, Mich., where the city is building an extensive municipal railway system, it has been found difficult to obtain shipments of material promptly enough to meet requirements. On the surface this appears to be a unique situation under prevailing conditions of light buying and prompt railroad deliveries, but it may possibly be a more general condition than is imagined. Reasonably good deliveries can be secured on orders placed normally for future use, it is stated, but where anything is wanted in a hurry it is almost impossible to secure it. As is always the case in any large construction program, there is frequently need for various equipment and material on short notice. Almost without exception, the municipal railway officials report, it has been impossible to find any manufacturer with a stock of the thing wanted on hand.

This is quite evidently an outcome of the declining price situation, for with inventories constantly diminishing, manufacturers are keeping their stocks just as low as possible to avoid loss. The purchaser at this time is then confronted with the necessity to await the manufacture of anything he wants. This is also a reflection of the refusal of railway companies to buy beyond their immediate and pressing requirements, in the expectation that prices will decline. Hence, if railway companies are unwilling to take any chance on a diminishing inventory of stocks on hand in their own storerooms, can they be surprised that the manufacturers should refuse to carry stocks and run this risk in order to meet hurry-up orders of their consumers?

Refractories Lower in Price

Output Greatly Reduced with Demand, but Stocks Are Good at the Mills

Recent price reductions in the refractory market brought Pennsylvania fire-clay brick down $2 per 1,000, while in the middle of April magnesite brick was reduced $10 per net ton in standard sizes, silica brick came down $5 per ton, $5 per net ton was applied to chrome brick and from $2 to $5 to fire-clay brick.

The demand for refractories is at a low ebb. Production, consequently, is in the neighborhood of 25 per cent, some of the larger producers working at a slightly higher rate, while among the smaller producers some shutdowns have been reported. Stocks, however, are in sufficient quantity to last over three or four weeks of normal demand, but at the same time steel mills still have some materials on hand. The steel and glass trades provide the strongest market for refractories, but these two industries are operating at about 40 per cent and 25 per cent rates respectively at present. Fire brick for power boilers provide not only a construction market but also a repair and maintenance market.

Easier Prices Noted on Some Miscellaneous Supplies

With rubber-covered wire selling from jobbers' stocks at prices ranging from $6.75 and $6.50 to around $7.50 per 1,000 ft. in 10,000-ft. lots, depending on the part of the country concerned, it might be expected that other wiring materials could be picked up at considerably lower prices than was the case a couple of months ago. Flexible armored conductor is on a $55 Pittsburgh base price but some jobbers are selling it for this amount in 1,000-ft. lots. Connectors for this conductor were just lowered 12 to 22 per cent.

Some renewable fuse manufacturers just dropped their prices about 17 per cent and at least one maker of fuse wire and fuse links has taken 20 per cent off his prices. From other quarters comes word of a 10 to 17 per cent drop in price of steel switch boxes and in floor boxes.

Westinghouse's Annual Report Shows Favorable Balance

Billings of the Westinghouse Electric & Manufacturing Company for the fiscal year ended March 31, 1921, from the company's annual report just issued, amounted to $150,980,106.39. The net manufacturing profit on the year's business was $12,206,021, even after taking out $5,315,196 for depreciation and adjustment of inventories. An appropriation for a special contingent reserve of $5,000,000 has also been made from surplus to provide for further possible shrinkages and adjustments in the inventories. Total surplus on March 31, 1921, amounted to $56,053,299 after adding a net income for the year of $12,617,535.

Property and plant account shows an increase over the previous year of $9,361,403 and embraces construction completed during the year. An important extension was made to the works at Lester, Pa., where the manufacture of steam turbines, condensers and marine propulsion apparatus is now concentrated, making available additional manufacturing space at East Pittsburgh for electrical apparatus. An additional lamp factory was erected during the year at Indianapolis, Ind., and extensions were made to the plants at Milwaukee, Bloomfield, Bridgeport, Mansfield and East Springfield, Mass. Developments and investments were made in the wireless field and other high-frequency current fields.

Accounts receivable amounted to $34,551,599, while inventories embrace $80,724,389. Total capital stock is $74,812,650.

Electric Railways Place Large Rail Orders

That there is some activity in the field of track construction work this spring, despite general dullness in the business situation, is evidenced by two sizable orders for rails and kindred material recently placed by electric railways. The city of Detroit, Mich., Department of Street Railways has placed an order for rails divided into lots of 900, 200 and 100 tons of different sizes, totaling about $80,000; 10,000 tons of another type of rail at a cost of nearly $600,000; special trackwork totaling about $100,000, and double-track specials amounting to nearly $25,000, or a grand total of almost $800,000.

The United Railways of St. Louis has placed an order for 5,000 tons of rails for the reconstruction of 32 miles of track during this year. Spikes, bolts and tie plates are also being ordered. The track construction is to cost about $1,485,000.

Rolling Stock

British Columbia Electric Railway Company, Ltd., Vancouver, B. C., Canada, will change over all its passenger cars with the exception of seventy-one interurbans, to conform to the new rule of the road which is being changed from left to right on or about Dec. 1. The interurban cars are standard but the platforms of the company's 319 city passenger cars will have to be reconstructed. The problem is increased by the fact that out of 231 cars operated in Vancouver, only forty-four are double-end. At least six months will be required to fit up the company's shops for taking care of this work.

Track and Roadway

British Columbia Electric Railway, Vancouver, Can.—Arrangements have been practically completed for changing the rule of the road from left to right in the lower portion of British Columbia on or about Dec. 1 next. Delay was occasioned until the government and the British Columbia Electric Railway could agree to terms on the defraying of the cost of changing the railway system. The government will pay $350,000 toward the cost which is estimated to be $800,000 for the change alone while the company will make other expenditures not essential to the change, bringing the total sum up to about $1,000,000. The change will probably take place in Vancouver and on the rest of the mainland system and later in Victoria, which is on Vancouver

Island. The changing of cross-overs, electric switches and points in the track is involved. On interurban lines changes will be necessary in cross-overs and stations.

Sterling, Dixon & Eastern Electric Railway, Sterling, Ill.—The Sterling, Dixon & Eastern Electric Railway plans to reconstruct its car lines in Sterling, at an estimated cost of $35,000.

Boston (Mass.) Elevated Railway.—The Boston Elevated Railway has recently placed an order for signal material which will be required for the installation of 68 automatic blocks in double-track sections on the main line in the Charlestown and Roxbury districts. The signals will be the style N, three-indication color-light type and of the same design as installed by the Boston Elevated at Sullivan Square interlocking and on the Everett extension in 1917. Model 15, two-element vane-type track relays will be used throughout. Electro-pneumatic automatic stops will be installed at each automatic signal. A new interlocking is to be installed at Tower D in connection with these improvements. This will be of the A. C. electro-pneumatic type governed by a seven-lever Model 14 power interlocking machine, controlling in addition to the switches, two 2-arm high and three dwarf signals, all of the style N color-light type. Extensive changes are also to be made at the large Tower C interlocking at North Station. These changes involve the installation of 14 two-arm and 10 one-arm style N color-light signals, as well as 15 automatic train stop layouts and 26 A. C. track circuits for the semi-automatic control of signals, detector locks and sectional route locking. All the track circuits will be operated with Model 15 two-element vane type track relays and the same type of instrument will be used for the line circuits. All materials are being furnished by the Union Switch & Signal Company, Swissvale, Pa.

Dallas (Tex.) Railway.—Service has been put into effect on the Lake Avenue extension out Fairmount Avenue to the City Hospital by the Dallas Railway. This is one of the extensions to which the traction company was committed under the terms of the franchise granted the Strickland-Hobson interests in 1917.

Tulsa (Okla.) Street Railway.—The Tulsa Street Railway Co. announces that it will soon begin the work of double-tracking its South Main Street line. Plans are also being prepared for double tracks on other lines and other extensions.

Power Houses, Shops and Buildings

Knoxville Railway & Light Company, Knoxville, Tenn.—The Knoxville Railway & Light Company will install a new substation at Washington and Sixth Avenues.

Professional Note

Parsons, Klapp, Brinckerhoff & Douglas, engineers, announce the removal of their Cleveland, Ohio, office to 743 Hanna Building.

The George H. Gibson Company, New York City, consulting engineers, specializing in commercial research and advertising of technical products, announces the removal of its offices from the Tribune Building to the Hide and Leather Building, 100 Gold Street.

Trade Notes

The Monitor Controller Company, Baltimore, has established a Cleveland office at 420 Permanent Building, in charge of Robert Notvest.

The Lunkenheimer Company, Cincinnati, Ohio, announces the removal of its Chicago branch from 188 North Dearborn Street to 568 West Washington Boulevard.

The Arrow Electric Company, Hartford, Conn., announces that its New York sales office has been removed from 253 Broadway to the Borden Building, 350 Madison Avenue.

C. C. **Bradford** has been appointed assistant secretary of the Ohio Brass Company, Mansfield, Ohio. Mr. Bradford was at one time sales manager of the United States Light & Heat Company.

The Star Porcelain Company, Muirhead Avenue, Trenton, N. J., manufacturer of electrical porcelain products, contemplates the erection of an addition, 30 ft. x 100 ft., two stories, to its plant.

E. Gindre, president and general manager of Le Carbone of Paris, France, is in the United States for an extended period for the purpose of investigating the prospects in the carbon and carbon-brush business incidental to the possibility of expanding his service in the United States.

Triangle Conduit Company, Inc., Brooklyn, N. Y., on May 5 opened a factory at 1965 West Pershing Road, Chicago, for the manufacture of armored conductors, armored lamp cord and flexible steel conduit. Stocks of these materials will be carried here in addition to stocks of non-metallic flexible conduit, "tri-cord," etc., made in the Brooklyn factory.

Economy Electric Devices Company, Chicago, Ill., has received an order for sixty-eight power-saving railway meters from the American Railways Company, Philadelphia, for use on its Chester Division. These meters will be equipped with car inspection dials to announce intervals between inspections, according to the energy consumption.

The Black & Decker Manufacturing Company, Towson Heights, Baltimore, announces that it is now represented in Pittsburgh by D. C. Paul, formerly with the Gaul, Deer & Shearer Company, Philadelphia. The Pittsburgh office is at 303 Penn Avenue, where there is also a completely equipped service station with a factory-trained service man in charge. This branch, of which Mr. Paul is manager, includes western New York, western Pennsylvania and the northern part of West Virginia.

John J. Swan has become associated with the Engineering Business Exchange, New York City, engaged in the purchase and sale of engineering and technical business properties. Mr. Swan graduated from Cornell in 1897. He was for a time one of the editors of *Engineering News* and has held engineering and executive positions with the Ingersoll-Rand Company, Chicago Pneumatic Tool Company, Longmead Iron Company, Keller Mfg. Company and others.

The Grindle Fuel Equipment Company, 1901 South Rockwell Street, Chicago, is offering, subject to prior sale, the unsold portion of $500,000 in 7 per cent cumulative and participating preferred stock at a par value of $50 a share, together with a bonus of one share of common stock. The proceeds of this sale will be used for additional working capital and for the construction and equipment of a new two-story factory building and a one-story foundry building. The plant will be used for manufacturing and demonstrating coal-handling machinery and equipment and coal-pulverizing equipment, in addition to gray-iron castings for the market.

New Advertising Literature

Fuses.—The Chase-Shawmut Company, Newburyport, Mass., has recently issued bulletin No. 201, describing and giving prices on the full line of material which it manufactures.

Controller. — Bulletin No. 44678A, just issued by the General Electric Company, superseding No. 44678, describes the company's various kinds of drum type controllers for railway service.

Jacks. — The Duff Manufacturing Company is distributing a new bulletin, No. 308, which illustrates and describes its line of automatic lowering jacks especially suitable for use in car repair shops, bridge work and for emergency service.

Engineering Catalog.—The seventh annual edition of "Sweet's Engineering Catalog" has been published by Sweet's Catalogue Service, Inc., New York City, listing in its 1,251 pages "materials, equipment and supplies relating to practical construction, equipment and maintenance of all projects of an industrial or engineering nature."

Tools, Etc.—Ingersoll-Rand Company, 11 Broadway, New York City, has just issued a large new loose-leaf catalog covering its entire line of various track tools, pumps, compressors, condensers, oil and steam engines, etc. A special section is devoted to engineering data covering problems which are frequently encountered in every-day compressed air practice.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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G. J. MACMURRAY, News Editor

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Now the One-Man Interurban Car

ONE-MAN safety cars for use in city service have become so common that they are accepted as a matter of course. Now, in this issue, an article by C. T. Dehore of Cincinnati, Ohio, relates how one-man, double-truck safety cars have recently been installed on a small interurban road running out of that city with satisfactory operating results and a great improvement in the net earnings. A total saving of $29,905 a year in operating costs, creditable to the new type of cars as compared to the old two-man, heavier cars is expected. On a per car basis this amounts to $5,981 per annum. This total saving represents a return of 79.7 per cent on the net investment made to accomplish the improvements, which was $37,500.

There are many small interurban properties over the country on which the use of such light-weight one-man cars should be satisfactory from the standpoint of service. On some of them it would appear that a step of this kind materially to reduce operating expenses would be very much in order if the property is ever to be expected to produce any return to the shareholders. On fairly short lines, where there is no demand for very high speed, such light-weight cars could be adopted with safety, and the power saving that would result is very material, as brought out in the article mentioned. Of course, one-man cars for interurban service would naturally be equipped with double trucks in order to secure good riding qualities on open-type track, which is rarely as smooth as good city track, as well as to permit a free running speed higher than called for in city service and higher than is safe with a single truck.

As to operation with one man, there should be no particular difficulty inasmuch as the traffic requirements would rarely be of the exacting nature of city service. The number of stops per mile is much smaller and the length of standing time while loading and unloading passengers is of less importance as it forms a much smaller proportion of the total schedule than in city service. Furthermore, any abnormal delay in passenger exchange is more readily made up because of the longer running periods. Hence, in view of these differences—lower density of traffic, fewer stops, higher speed, longer distances—it is logical to assume from present knowledge of the standard one-man safety city car that the similar car for interurban service could be made larger than the city car without overburdening the operator. These thoughts are quite evidently embodied in the design of the car described in Mr. Dehore's article.

While it is highly desirable that those interurban lines which connect important terminals and extend into sizable systems should be developed along the lines of heavy traction, it may well be recognized that those other lines which just run out into the country and stop (most of those radiating from Cincinnati being excellent examples of the type) have no such future and that they can best be developed more along the line of street car practices. The paramount issue with most of them is to get the operating cost down to a basis comparable with their limited earning capacity, so that a surplus will be a possibility. The use of one-man, double-truck safety cars seems to offer an opportunity for more economical operation without introducing any particular hazards, though requiring some changes in operating practices. Hence a widening use of one-man, light-weight, double-truck safety interurban cars in the next few years may not be an unexpected development.

Electric Railway Industry Must Expand with Its Opportunities

THE men who have been brought up in the steam railroad field are apt to look condescendingly in a professional way on their electric railway brethren. They feel that the "trolley" men know light transportation only, while they themselves are engaged in real railroading. This attitude must be changed, and that by demonstration of the fact that there is no sharply defined boundary between heavy and light traction. Electric railways are handling short-haul passengers on a scale unheard of in the steam field, and they are doing a freight business also of no mean proportions. A first-class, high-speed interurban railway or rapid-transit system is giving a service in every way commensurate with corresponding steam transportation. When the steam roads are in a position to finance electrification extensively they will find that many of their problems have already been solved for them by the "trolley" fellows. The multiple-unit cars used in large numbers by the electric railways and to an increasing extent by steam railroads are ideal for intense suburban service. Again, the electric locomotive itself is a product of electric railway development.

The application of the electric motor to transportation has developed in three stages. First the horse, the mule, the cable and the steam "dummy" were supplanted. Then the elevated steam lines were electrified and high-speed interurbans were built. Last, and the greatest development of this still lies largely in the future, the steam locomotive is being displaced by the electric locomotive. This development was traced by Frank J. Sprague in his Franklin Institute address, abstracted this week. In other words, the electric motor is gradually pervading the whole field of rail transportation, which is essentially one field. The engineers and manufacturers who are leading in the campaign for railroad electrification aim simply to convince operators who have been "raised" on the steam engine that a better motive power is now available. The performance of the electric motor elsewhere, and to a limited extent in this field, ought to inspire respect for its power producing characteristics.

The Passing of the Woman Conductor

THREE years ago, or during the labor scarcity caused by the war, many women were employed as conductors on cars both in America and Europe, although the practice was followed to a greater extent abroad than here. Since the armistice the number has decreased for one cause or another. On the New York City properties the direct reason was a law passed by the New York Legislature in May, 1919, forbidding the employment of women on trolley cars before 6 a.m. or after 10 p.m. or for more than nine hours a day. In January of the same year the engagement of any more women as conductors in Detroit was forbidden by the National War Labor Board after the dismissal of those employed by the company had been demanded by the union. A few women conductors or guards are still employed on the Hudson & Manhattan Railroad and on some other lines, but in general throughout the country they have disappeared from service as members of train crews.

The subject may almost be said to have been forgotten by railway men, but has been brought up through a report recently issued by the Women's Bureau of the United States Department of Labor and reviewed in these columns. The conclusions of this report are generally favorable to the service as suitable to women and less onerous and more highly paid than many other lines in which women are employed. Before the subject is passed entirely, it might be worth while to put on record some of the conclusions reached from the railway standpoint during a somewhat limited trial in this country of women conductors.

In the first place there is some additional expense involved to a company employing both women and men in the transportation service over that required when only men are employed, owing to the necessity of providing separate quarters at the carhouses and elsewhere. This means that even if everything else was equal, to make the engagement of women no more expensive to the company the women would have to receive a lower wage than the men. Just how much this differential would be it is hard to say, but it is obvious there would have to be some differential.

In the second place, the tendency toward the use of one-man cars, in the opinion of most operators, still further cuts down the opportunity for women as part of the transportation force. It is probable also that their less physical strength handicaps women for the position of conductor on some lines. Again, new legislation limiting the conditions under which work may be done or the hours in which it may be performed is apt to be more stringent in the case of women employees than with men employees, and any material difference in the conditions or hours permitted for the two classes would require a division into a favored and a less favored class, and this would interfere with seniority rules.

Finally, there is now no difficulty and there probably will not be for a considerable time, at any rate, in securing a sufficient number of men for platform service, so that there does not seem to be the same reason for the engagement of women as during the war.

Abroad, both in England and on the Continent, women have been employed as substitutes for motormen as well as conductors. Testimony as to their fitness for this work varies, but on some roads they are considered superior to men, or certainly to the men who could be hired at the same wages. The way in which this superiority is shown is in the exercise of greater care and the acceptance of greater responsibility in their work. As the use of women as substitutes for motormen has been very limited in this country, American evidence on this point is not of much value.

The modern car has so many labor-saving appliances that much manual power is not required by either a conductor or motorman. Hence the tendency will be more to judge applicants on the basis of intelligence, faithfulness and similar qualities rather than on strength. Nevertheless, the greatest use for women, for some time to come, at any rate, in electric railway transportation service will probably be in the stations and offices and not on the cars.

Has Connecticut Shown the Way in Valuation Procedure?

THE recent valuation of the property of the Connecticut Company, made, as it was, by the Public Utilities Commission of the State, is of more than usual interest. It is what the commission calls a business-like valuation and marks a departure from the usual method of obtaining the fundamental information upon which a commission bases its final action. In this issue Mr. Knowlton finishes his analysis, started last week, of this valuation, and outlines the method by which it was possible to save so much time and money in obtaining the necessary data. A critical examination of this is recommended to all who are interested in valuation procedure. It should be kept in mind, however, that the purpose of this two-part article is to outline and analyze a method. Complete figures naturally cannot be given for application elsewhere and details of the method itself would probably have to be modified in case of its application to other properties.

Progress in valuation practice has, of course, been evident in recent years. This, however, has been chiefly in that the engineers of the various contending groups have agreed upon an appraisal figure for the physical property and thus avoided endless litigation. Instances are the Pittsburgh, Scranton and Nashville valuations. Another step was taken in New Jersey, where the engineers were asked to take the place of the commission, so to speak, and, considering all factors, to name the total valuation figure. But each of these has been accompanied by a long and expensive inventory, which is most undesirable both from the standpoint of expense and also delay and suspense. In these statements regarding the recent New Jersey valuation the inventories made during the previous valuations and used by the last engineers are considered a part of the total appraisal work.

The question is how to get away from this and Connecticut seems to have given one answer. Here more than $50,000,000 worth of property (on a 1910-1915 price basis) was appraised in less than six months and historical value was also determined at a total cost to the commission of less than $10,000. Several factors made this possible: the work was done largely by salaried engineers and accountants of the commission, who already had an intimate knowledge of the property; the commission specified that it wanted a "business-like" valuation; the records of the company were unusually specific and detailed as to the various facts needed. But these factors do not weaken the method, rather do they strengthen it. The method of appraisal itself is logical—the use of measuring sticks for outside plant and the application of usual business judgment all through. It is of interest to note the relation of the total thus found to the historical cost, and that the appraised value of the physical property differed not more than 2 per cent from the book value of the company.

Most important, the commission accepts and uses this value in its report to the Legislature; the Legislature, in turn, bases its present program of railway legislation upon this report, thus tacitly accepting it as valid. The commission and legislative sanction of this method of appraisal is significant. More than ordinary weight may be given to the attitude of the Legislature in view of the fact that the chairman of the committee considering the report is himself an engineer of note in the State.

Objection to the method itself may be urged in that, by the adoption of unit yardsticks, instances of abnormal construction, of special installations, etc., may be neglected or minimized. But the inspection of the entire system and the method of obtaining a typical unit are both checks against this. And then, actually, way down in his heart, what valuation engineer is there who doesn't use the mile of track, the 1,000 ft. of overhead, the kilowatt of power station and substation as the real check or measure of the reasonableness and accuracy of his valuation, made by however detailed a method? There seems much to support the direct use of such figures if they can be determined with sufficient accuracy to carry weight in the individual case, and this is what Mr. Knowlton tries to show has been done in Connecticut. There are so many other factors than mere physical appraisal which really affect the final rate that it is a serious question whether the expenditure of so much time and money in determining this figure is really justified.

To be sure—to answer a self-evident question—no rates have yet been determined upon this as a base. But Mr. Knowlton shows within what wide limits an appraisal may vary without any effect upon a rate, and as a matter of fact, in how many cases has the valuation had an appreciable—still less a controlling—effect upon rates, anyway?

A valuation figure adopted means business life or death, economic success or failure, more often than anything else. It is fundamentally a business question rather than a rate question and is so recognized by the Connecticut Commmission.

But what will valuation engineers do? Frankly, they may lose one source of lucrative practice. But they ought to be more anxious and willing than any one to adopt a business-like basis of appraisal and to save the time and drudgery of detailed inventory. Valuation is not constructive, though it may be necessary. Engineering is fundamentally constructive and engineers should welcome anything which will relieve them of non-constructive work so that their energies may be directed toward constructive lines.

Quotation from the Federal Electric Railways Commission Report No. 22

THE electric railways should adopt the policy of setting aside a depreciation fund with which to take care of replacements and thus preserve the integrity of their investment. It would have a very wholesome effect upon credit. Such has not been the practice in the past. Deferred maintenance has accumulated to an alarming extent during the war period.

Generally speaking, regulating commissions have the power to prescribe methods of accounting and to establish the amount of the depreciation fund. This practice should be observed, and its adoption will improve the situation of the industry and be greatly in the interest of the public welfare.

A big question is the court attitude. Legal rules of evidence have been largely responsible for present appraisal procedure. But there is encouragement in court attitude today. Note the "reasonableness" introduced by the Supreme Court, for example. And courts are more and more inclined to be business-like themselves and to allow commissions to establish their own procedure. In this case, the sanction of both commission and Legislature should have much weight in determining the attitude of the court and therefore the result af any possible court action should a case based on this valuation come up for review.

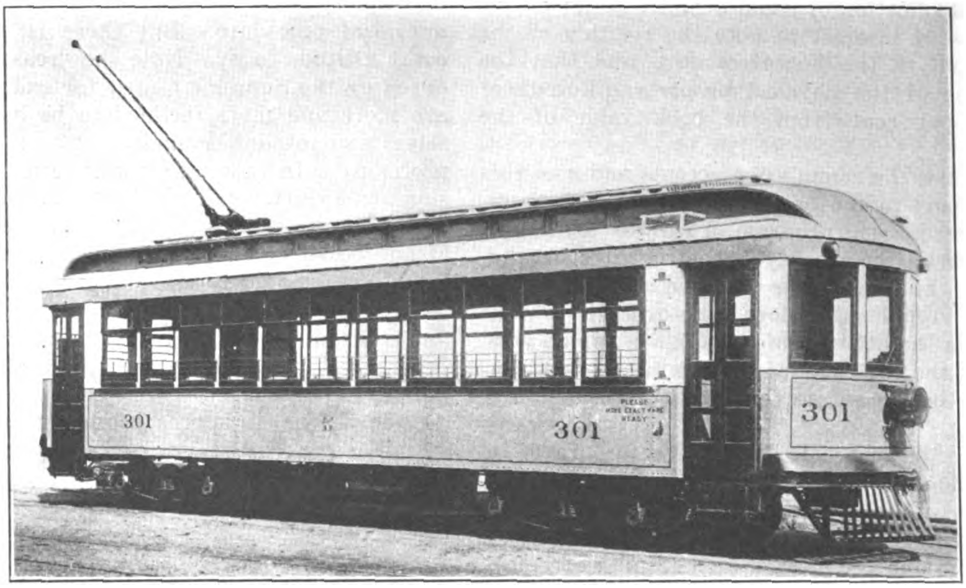
Viewed broadly, valuation procedure is tending in the right direction. The American Electric Railway Association valuation committee is studying the problem of how to reduce the time and expense of appraisals. It seems logical to approach a business question from a business angle. Connecticut has made a worth-while contribution in this connection to valuation procedure.

Tax Exemption Extended in Massachusetts

IT IS APPARENT that the members of the Massachusetts Legislature are satisfied that their street railways are not yet out of the financial difficulties which began before the war, but were brought to a head by the extreme conditions which that conflict caused. As reported elsewhere in this issue, the Governor's signature has recently made a law of the bill to exempt the companies for the next two years from the operation of the excise tax, imposed in commutation of the cost of repairing and maintaining highways and bridges.

The reputation of the old Bay State as a leader in wise and conservative legislation and regulation concerning her street railways is too well known to require further extensive comment at this time. Having from the beginning restricted the capitalization of the companies to actual cash investment and having prohibited the issue of stock at anything less than par, this State now shows a disposition to make reasonable provisions looking toward the protection of such investments. It is true that a number of companies in that state have been through a receivership, and many miles of track have been abandoned. Perhaps not in all, but at least in a goodly proportion, such cases have been where over-optimistic promoters have built in sparsely settled territories, or where lack of foresight on the part of the managements has resulted in financial embarrassment. No Legislature can be expected to go out of its way to offer protection in such cases. But the recognition by the Massachusetts Legislature of the general financial hardships which the industry as a whole is suffering through no fault of its own is an encouraging sign.

The action of the Speaker of the House of Representatives of Massachusetts in standing up for and securing a reconsideration of the exemption bill, after the original motion was defeated, was an exceptionally courageous proceeding, in view of the apathy if not direct antagonism of the general public toward the financial prosperity of utilities.



SINGLE-END, DOUBLE-TRUCK, ONE-MAN SAFETY CAR FOR INTERURBAN SERVICE

One-Man Cars for Interurban Service

How the Cincinnati, Milford & Blanchester Traction Company Met a Difficult Financial Situation by Installing New Equipment and Making Such Changes as Would Greatly Reduce Operating Costs

BY C. T. DEHORE
Cincinnati, Ohio

FACED with an inevitable receivership unless operating costs or earnings could be radically changed, the Cincinnati, Milford & Blanchester Traction Company, Cincinnati, Ohio, under the direction of J. P. Perrung, president and general manager, decided in January, 1920, to take immediate and drastic action to stem the tide of rising costs. The criticalness of the situation can be readily understood from the few words explaining that during one month in the fall of 1920 the cost of power alone was 60 per cent of the total receipts. It is said that had the changes which were effected been delayed three months longer the railroad probably could not have held out. As a result of the changes made, however, it will be possible to continue operation on the line, and in fact indications are that the financial crisis has been passed and that the company should now be able to wipe out its debts and become a paying property.

The changes which were decided upon and which were put into effect as quickly as the new equipment could be secured were these: The old 30-ton, forty-four-passenger, two-man cars were replaced with 15-ton, forty-seven passenger, one-man, double-truck cars. A 1,000-kw., 25-cycle generating station was shut down and arrangements were made for purchasing power from the Union Gas & Electric Company of Cincinnati at 13,200 volts 60-cycle frequency. For the 1,100-kw. capacity of 25-cycle substation equipment 400-kw. capacity of 60-cycle equipment was substituted. The fourth major change made was in connection with the light and power business handled by the company, wherein a 100-kw. frequency changer was displaced with 250-kw. capacity in lighting transformers, which enabled the company to take on 250 new commercial customers.

The C., M. & B. T. line is 28.8 miles long and connects Cincinnati (Madisonville) with Blanchester, Ohio. In addition to handling passengers, freight, milk and express, the company does a general lighting and power business in towns along the line. Travel on the Blanchester end of the road is very light, while fairly good traffic is obtained on the Madisonville end, particularly in the warmer months, when summer homes and camps along the Miami River are open. The equipment formerly in use and the operating conditions generally were similar to those found on a great many other small interurban lines, namely, heavy, obsolete rolling stock with power supplied from a small-capacity and inefficient generating plant.

The old rolling stock consisted of eight passenger cars, three freight cars and two work cars. The passenger cars were in need of paint and repairs and had practically outlived their usefulness. They weighed about 30 tons each, were geared for high speed and were equipped with two different types of old-style motors. These cars were replaced, under the rehabilitation plan, with five 15-ton, forty-seven-passenger, single-end cars equipped with standard safety devices for one-man operation, probably the first cars of this type for interurban operation. They were built by the Cincinnati Car Company. They have a standard monitor deck roof, are 40 ft. long and 8 ft. 6 in. wide and have steel underframes and side-girder plates, wood posts and letterboards and composite superstructure.

There are eleven windows on each side, and notwithstanding the inclusion of a stove and toilet, seats for forty-seven passengers are secured by using the rear "platform" as a smoking compartment. This popular compartment will seat five passengers and it is separated from the main passenger section by a partition and a swinging door. The seats are the Hale & Kilburn 38-in. stationary type with rattan-covered spring cushions and backs. The heater is of the Jewel hot-air type with motor-driven blower. Lighting is obtained from ten 56-watt lamps arranged in a straight line through the center of the ceiling and used in combination with G.E. shade holders and receptacles fitted with holophane shades.

The trucks are of the arch-bar type with a combination semi-elliptical and spiral spring design and a wheelbase of 5 ft. 8 in., manufactured by the Cincinnati Car Company. The electrical equipment consists of four G.E. 264-A, 25-hp. sleeve-bearing motors, and one K-35 controller. A G.E. J-37 type headlight with the new design of "GECO" resistor is used. The air-brake equipment includes the type CP-27 compressor and type ML Form A governor. The cars are geared for a free running speed of about 32 m.p.h. and make a schedule speed of 20 m.p.h. Hourly service is given during the winter months and half hourly service during the summer.

Heretofore, power was manufactured in a steam plant located at Milford, 8.5 miles from the Madisonville end of the line. The equipment there consisted of four 200-hp. Stirling boilers and two engine-driven 500-kw., 370-volt, 25-cycle generators. The engines needed overhauling; the boilers were in only fair shape and an addition to the smokestack was necessary to replace a section blown down in a windstorm. The immediate repairs needed called for an expenditure of about $3,500. The energy used for light and power customers was secured from a 100-kw. frequency changer located in the power house and consisting of a 370-volt, 25-cycle motor and a 2,300-volt, 60-cycle generator. This unit was badly overloaded and there was no reserve capacity available. In fact, the company had reached the point where it was forced to turn away new business.

To alleviate this situation and place the power cost on an economical basis a contract was negotiated with the Union Gas & Electric Company of Cincinnati whereby this company built a 13,200-volt, 60-cycle transmission line to the railway company's substation at Indian Hill, where power is delivered and metered to the latter. The power contract is based on a fixed maximum demand charge with a sliding scale rate for actual energy consumed, so that the railway company has a chance to lower its rate by leveling off its load factor. As an instance of how this may be done, the railway company found that by changing its freight-car schedule slightly it was able to reduce the maximum demand charge about $100 per month. An effort is now being made to secure some pumping load to be handled at night, which will further reduce the cost per kilowatt-hour.

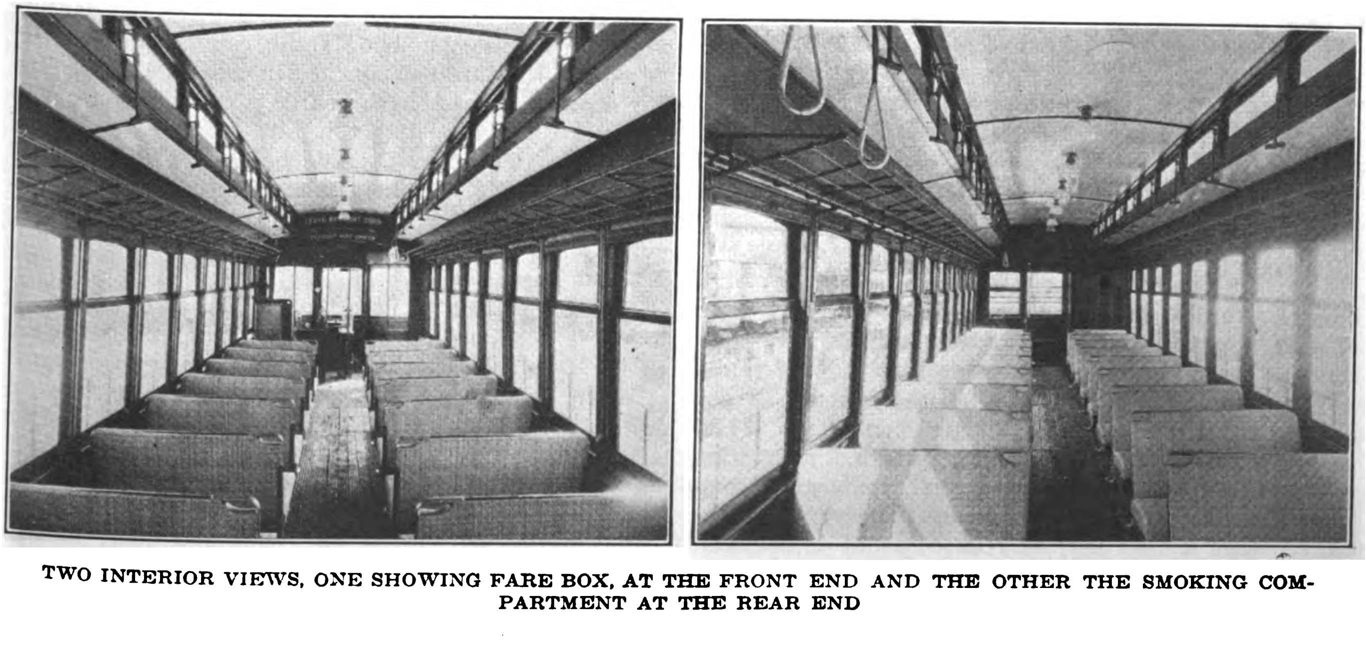
As the power company has a 120,000-kw. turbine generating station of modern design and is in a position to furnish unlimited power, the railway company has laid out its distribution system so that it can be quickly and economically extended to serve new customers. An increase in the gross receipts from the light and power department of from $2,000 to $3,500 per month has been secured as the result of new customers connected.

Under the old system of operation the company had a 300-kw. substation at Indian Hill, 5 miles from Madisonville; a 400-kw. substation in the power house at Milford, 3.5 miles farther, and a 400-kw. substation at Newtonville, 9 miles from Blanchester. The total substation capacity was then 1,100 kw. Under the new plan only two substations are used, one at Indian Hill and the other at Newtonville. Each is equipped with one 200-kw., 600-volt, six-phase, 60-cycle G.E. commutating pole rotary converter. The total substation capacity on the system is thus seen to be 400-kw., sufficient for handling the new light-weight cars.

To make the changes necessary, as described briefly above, the company required an initial investment of $63,000, against which there is a credit for salvage of about $25,500, leaving a net capital investment of $37,500 as outlined below:

INVESTMENT COSTS

Five new cars complete at $9,000		$45,000
Two 200-kw. substations at $6,500		13,000
Three lighting transformer stations		5,000
Total cost		$63,000
Less salvage:		
Six 4-motor cars	$6,000	
One 1,000-kw. power station	15,000	
Three rotary converters, etc	4,500	25,500
Net investment		$37,500



TWO INTERIOR VIEWS, ONE SHOWING FARE BOX, AT THE FRONT END AND THE OTHER THE SMOKING COMPARTMENT AT THE REAR END

COMPARISON OF OPERATING COSTS

	Old System	New System	Saving
Platform wages (passenger), actual	$14,325	$8,290	$6,035
Power (1919 costs)	42,500	21,120	20,620
Maintenance of cars (estimated)	8,500	6,300	2,200
Tie renewals (estimated)	8,750	7,700	1,050
	$74,075	$43,410	$29,905
Increase in lighting business per year (actual)			18,000
Increase in net earnings			$47,905

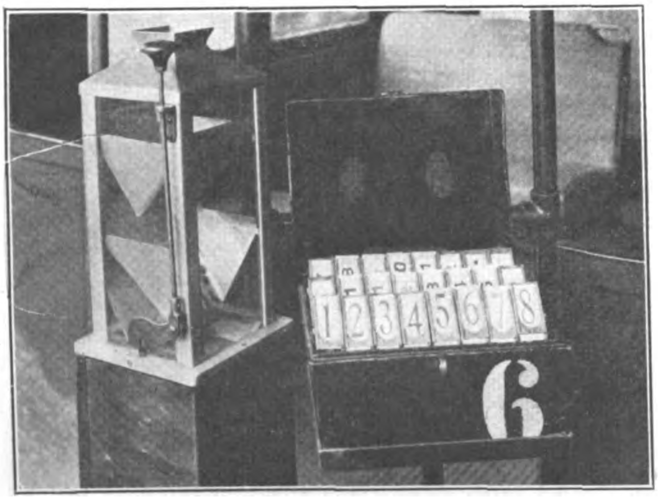
STATISTICS

	Old System	New System
Passenger car-miles	280,000	280,000
Freight car-miles	20,000	20,000
Total kilowatt-hours	2,131,000 kw.-hr.	1,408,000 kw.-hr.
For passenger cars	1,680,000 kw.-hr.	700,000 kw.-hr.
For freight cars	108,000 kw.-hr.	108,000 kw.-hr.
For light and power	343,000 kw.-hr.	600,000 kw.-hr.
Kw.-hr. per car-mile (passenger)	6.0	2.5
Kw.-hr. per car-mile (freight)	5.4	5.4
Maintenance per car-mile	2.83 cents	2.1 cents
Track and roadway maintenance per car-mile	5.3 cents	4.95 cents
Tie spacing	2 ft., 0 in.	3 ft., 0 in.
Platform wages per hour, per man	50 cents	58 cents

As a result of this expenditure the company has increased the net return about $47,905 per year, and this figure does not make allowances for 1920 coal prices. (It actually cost the company $66,000 in 1920 to produce power.) The figure for power in the column "Old System" in the table above is based on 1919 costs.

The saving in platform wages given above is the actual saving obtained after allowing the operators of the safety cars an increase of 8 cents per hour. The saving in power is the actual difference between what it cost in 1919 to produce power in the company's old plant and the cost to purchase their requirements in 1921.

The saving in maintenance is estimated on the basis of a somewhat higher figure than is actually being obtained for similar cars on the Cincinnati, Lawrenceburg & Aurora Traction Company after three years of operation, the actual cost on that railway being 1.45 cents as compared with the above estimate of 2.1 cents.

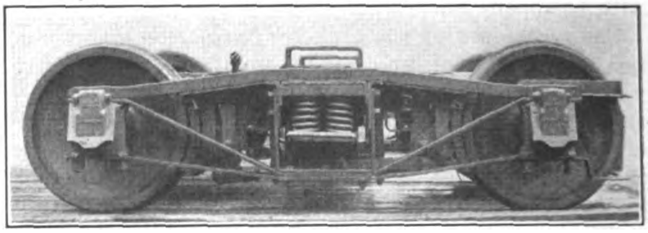


CLOSE UP OF FARE BOX AND ZONE TICKET BOX

The saving in tie renewals is based on only 12 per cent of the actual cost of 7,000 ties per year at $1.25 each. With the light-weight car, however, the traction company is now spacing ties at 3-ft. centers, as compared to 2-ft. formerly. This means that eventually the tie renewals will actually be reduced about 40 per cent, although this latter figure will not be reached for some three or four years to come. This saving is not theoretical. It has actually been determined from results obtained by the Union Traction Company, Nashville, Tenn., which has operated similar weight cars for about fifteen months, and the Cincinnati, Lawrenceburg & Aurora Traction Company, Cincinnati, which has operated them for three years.

FARE COLLECTION METHOD

The collection of fares at first seemed rather complicated, but has really worked out very satisfactorily. There are twenty-two zones, some of which overlap, and it seemed quite a task to work out a plan where one man could handle the situation promptly and efficiently. The system adopted is as follows:



ARCH-BAR TRUCKS USED ON LIGHT-WEIGHT, ONE-MAN INTERURBAN CARS

A standard Cleveland fare box is used and all fares are collected pay-as-you-enter. The passenger deposits his fare, either cash, regular ticket or commutation ticket, in the fare box and is presented with an identification ticket (hat check), bearing the number of the zone to which he is entitled to ride. Upon reaching his destination he deposits this identification ticket in the box. Should the zone in which the passenger is alighting not correspond with the number on the ticket the operator calls his attention to this and requests any additional fare that may be due.

The zones are numbered from 1 to 22 from the Madisonville end toward Blanchester, and these numbers are the same, regardless of the direction the car is going.

The identification ticket is 2 in. long x ¾ in. wide, with a large zone number printed on both sides so it can easily be read, regardless of how it falls in the fare box. Smaller figures are also printed along the edge of the identification ticket, and, in the case of a cash fare, the number corresponding to the zone in which the passenger boards the car is punched out. These numbers are not punched in case of a ticket fare. For example, a passenger boards a car at Madisonville (Zone 1) and deposits cash fare to ride to Milford (Zone 7). The operator punches out 1 in the small figures of a No. 7 zone ticket. If the passenger deposits a regular or commutation ticket, however, no punch mark is necessary, and he is simply given a Zone 7 ticket unpunched.

It is interesting to note that so far as is known not a single instance of over-riding has been attempted in the four months that the cars have been operated.

When service with the new cars and new fare collection system was started off, two men were used for about forty-five days to allow the operators, as well as the public, to become thoroughly acquainted with the operation. Since that time the cars have been running just as successfully with one man; in fact, most of the operators state that they prefer the one-man operation and responsibility.

Railway Valuation in Connecticut—II[*]

Development and Application of "Unit-of-Construction" Method of Appraisal in Valuing Large Railway System

BY ARCHER E. KNOWLTON
Instructor in Electrical Engineering, Yale University

IN LAST week's issue Mr. Knowlton presented the arguments which led the Public Utilities Commission of Connecticut, and its engineers, to adopt what they called a "practical, business-like valuation" of the electric railways of the state and also some details of how the "non-outside-plant" accounts were treated.

In this issue, the details of the "unit-of-construction" or "yardstick" method of appraisal are described and the method justified. It was by the use of this method, more than any other one item, that made possible this valuation of more than fifty million dollars' worth of property at a cost of approximately $10,000 to the state and not to exceed that sum to the company. The time consumed in this whole valuation was less than six months and even during this period the engineers had many regular duties to attend to besides the valuation

—EDITORS.

IN THE previous article several arguments were advanced in favor of a quick and inexpensive appraisal of utility property and it was suggested that the greater saving in time and money could probably be effected in dealing with the "outside plant." In both surface construction and overhead electric construction there is presented a peculiar combination of practical uniformity for stretches of more or less length and, at the same time, wide diversity between the characteristics of even consecutive stretches. The engineers (E. I. Rudd, J. P. Wadhams and the writer) who appraised the street railways of Connecticut for the Public Utilities Commission of that state decided to ascertain the value of the extended property as far as possible by setting up an appropriate number of types of construction for track and paving, contact system, feeders, telephones and signals, transmission lines and bonding and then applying these types in "yardstick" fashion to those properties. It was recognized, of course, that occasional irregularities would not conform to these types, but it was not anticipated that the total value of the irregularities would be great enough to invalidate the results obtained by applying the type costs.

LOW-VOLTAGE DISTRIBUTION SYSTEM

In investigating the possibility of applying the unit-of-construction method of appraisal to the contact-system, it was quickly ascertained that the character of the highway or community, the type of service provided, and the presence of other utilities' wire circuits were the ruling factors in determining the type of contact construction employed by the street railway company. With the exception of the third item, these factors are usually found to continue constant for sufficient distance to result in practical uniformity of the railway construction for distances of several hundred feet. It was estimated that an observer on an inspection car could probably note the character of construction and status of pole ownership in the various sections and, in addition, identify the points of change in about one-sixth of the time required for two or three men to walk the same section and tally in detail every item of physical property. This estimate was not irreconcilable with the actual experience; the 480 miles of route were covered in about sixteen days and the speed of travel gave ample time to note all necessary features of feeder system, telephones and signals as well as of the contact system. It will be noticed that no reference is made to measurements of lengths in the field. Three principal office sources for such information were available and practically no field measurements were necessary. The company's mileage maps gave, to the nearest thousandth of a mile, the distances from the traffic center to switching points of turnouts, special trackwork and sidings, to town lines, railroad crossings and the line termini. Track and paving sheets prepared and maintained by the company's engineer of maintenance of way gave much detail on rail, paving and ballast and often the points of transition coincided with those for the overhead construction for which no lists were available. Finally highway maps of the state were of aid in other instances.

Before proceeding to establishment of the fundamental types of contact construction, it is necessary to touch upon the extensive practice of wire companies in Connecticut as to joint use and joint ownership of wood poles. One of the joint occupants is agreed upon as the builder and custodian of the line; it shall keep an accurate record of the cost of the construction and subsequently bill the other joint owners for their proper share of that cost, which includes field labor, materials, vehicles and a percentage increment for engineering and supervision. Analysis of the costs of representative sections of line jointly occupied by the street railway, in some cases built by the railway forces but more often by those of other utilities, led to the adoption of the following ratios in value to the railway company between solely owned and occupied wood poles and those jointly owned and occupied:

	Per Cent
Solely owned pole	100
One-half interest in two-party pole	62½
One-third interest in three-party pole	50
One-fourth interest in four-party pole	33⅓

The existing cases of permit and rental attachments were treated as joint ownership cases on the assumption that they would practically balance by reciprocity.

As for the size of trolley wire to use in setting up the types, examination of one representative division showing the usual proportions of business district, residential, suburban and rural mileage resulted in an average size of 0.453 lb. per foot. This figure was used even though it is not a commercial size, and the costs of wire, ears, etc., were obtained by interpolation.

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[*] In two parts. Many data and supporting figures for the electrical part of the appraisal treated in this installment are given in greater detail than possible here in a thesis Mr. Knowlton has just presented to the faculty of the Graduate School, Yale University. Complete data are of course on file at the office of the commission in Hartford.

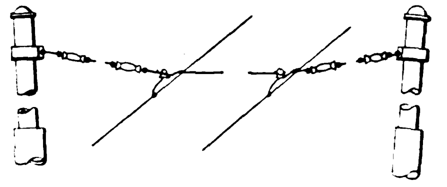


FIG. 1—COST OF SPAN CONSTRUCTION, IRON POLES, DOUBLE TRACK

Type	Cost of SSID Poles	Plus Per Cent of SSID Poles	Plus Part Cost of SSID Poles	Cost 1,000 Ft. SSID Less Poles	Cost of Joint Construction	
					Per 1,000 Ft.	Per Mile
SSID	$685.00	100.0	$685.00	$257.32	$942.32	$4,975.54
SJ$_2$ID	....	62.5	428.13	......	685.45	3,619.17
SJ$_3$ID	....	50.0	342.50	......	599.82	3,167.05
SJ$_4$ID	....	33.33	228.33	......	485.65	2,564.23
SSJ$_2$ID	....	81.25	556.56	......	813.88	4,297.29
SSJ$_3$ID	....	75.0	513.75	......	771.07	4,071.25
SSJ$_4$ID	....	66.67	456.67	......	713.99	3,769.87

Per Span							Per 1,000 Ft. Section					
No.	Each	All	F.C.W.*	A.I.†	Total	Item	Size	Quan.	F.O.B.	F.C.W.	A.I.	Total
2	$24.10	$48.20	$3.10	$17.20	$68.50	Iron poles (caps, gds, conc., S-W.) 934 lb.	No. 3-30 ft.	20	$482.00	$31.00	$172.00	$685.00
2	.19	.38				Pole bands	5 in.	20	3.80			
50 ft.	.009	.45				Span wire	$\frac{5}{16}$ in.	500 ft.	4.50			
4	.16	.64				Wood strain insulators (no clevis)	9 in. E	40	6.40			
2	.368	.74				Straight line hangers		20	7.40			
		2.21	.11	1.00	3.32	Span assembled and installed			22.10	1.10	10.00	33.20
	.39					Strain plate		2	.78			
	.21					Wood strain insulators (with clevis)		16	3.36			
	.009					Anchor wire		600 ft.	5.40			
						Strain complete			9.54	.48	2.25	12.27
						Trolley wire						
						Ears						
						Suspended trolley wire		2,000 ft.				175.85
						Truck or line car, 4 days on poles. 0.8 days on wire		4.8			7.50	36.00
						Finished construction		1,000 ft.				$942.32

In adopting the types and the associated symbolic notation, the four aspects of contact construction which determine its character and cost are, with the codes for use in the field inspection:

A. **Suspension** Bracket = B
Span = S

B. **Ownership of Poles** Sole = S
Joint = J

C. **Pole Material** Wood = W
Iron = I
Concrete = C

D. **Number of Tracks** Single = S
Double = D

The fundamental combinations of these elements were taken to be the following:

1. Bracket construction, Sole ownership, Wood poles, Single track = BSWS
2. Bracket construction, Sole ownership, Wood poles, Double track = BSWD
3. Bracket construction, Sole ownership, Iron poles, Single track = BSIS
4. Bracket construction, Sole ownership, Center Iron poles, Double track = BSID

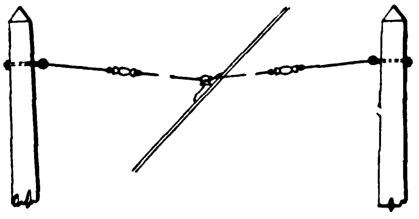


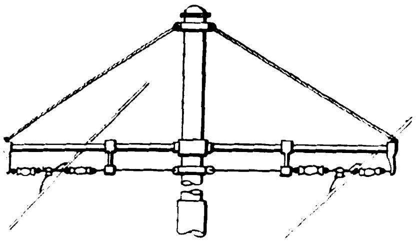
FIG. 2—COST OF SPAN CONSTRUCTION, WOOD POLES, SINGLE TRACK

Type	Cost of SSWS Poles	Plus Per Cent of SSWS Poles	Plus Part Cost of SSWS Poles	Cost of 1,000 ft. SSWS Less Poles	Cost of Joint Construction	
					Per 1000 Ft.	Per Mile
SSWS	$158.80	100.00	$158.80	$156.51	$315.31	$1,664.84
SJ$_2$WS		62.50	99.25		255.76	1,350.41
SJ$_3$WS		50.00	79.40		235.91	1,245.60
SJ$_4$WS		33.33	52.93		209.44	1,105.84
SSJ$_2$WS		81.25	129.03		285.54	1,507.65
SSJ$_3$WS		75.00	119.10		275.61	1,455.22
SSJ$_4$WS		66.67	105.87		262.38	1,385.37
SJ$_2$J$_3$WS		56.25	89.33		245.84	
SJ$_2$J$_4$WS		47.90	76.07		232.58	
SJ$_3$J$_4$WS		41.66	66.06		222.57	

Per Span							Per 1,000 ft. Section					
No.	Each	F. O. B.	F.C.W.	A.I.		Item	Size	Quan.	F. O. B.	F. C. W.	A.I.	Total
2	$3.25	$6.50	$2.68	$6.70	$15.88	Chest. poles, shaved, treated, set	.. 30 ft.	20	$65.00	$26.80	$67.00	$158.80
2	.095	.19	.02	.40		Eyebolts, nuts, washers	$\frac{3}{4}$ in. x 16	20	1.90	.24	4.00	
50 ft.	.009	.45				Span wire	$\frac{5}{16}$ in.	500 ft.	4.50			
2	.16	.32	.05	.60		Wood strain insulators (no clevis)	9 in. E	20	3.20	.50	6.00	
1	.368	.368				Straight line hangers		10	3.68			
		1.328	.07	1.00	2.402	Span assembled and installed			13.28	.74	10.00	24.02
	.39	.39	.02			Strain plate		1	.39			
	.21					Wood strain insulators (with clevis)	9 in.	16	3.36			
	.009					Anchor wire	$\frac{5}{16}$ in.	600 ft.	5.40			
						Strain complete			9.15	.45	2.00	11.60
lb.	.162		.01		.172	Trolley wire 1,000 ft.	.453 lb./ft.	453 lb.	73.39	4.53		
1	.26		.01		.27	Ears		11	2.86	.11		
ft.				.007		Suspended trolley wire		1,000 ft.	76.25	4.64	7.00	87.89
						Truck or line car, 4 days on poles 0.4 days on wire					7.50	33.00
						Finished construction		1,000 ft.				$315.31

*F.C.W. indicates Freight, Cartage and Warehousing. †Indicates Assembly and Installation.

FIG. 3—COST OF BRACKET CONSTRUCTION, CENTER IRON POLES, DOUBLE TRACK



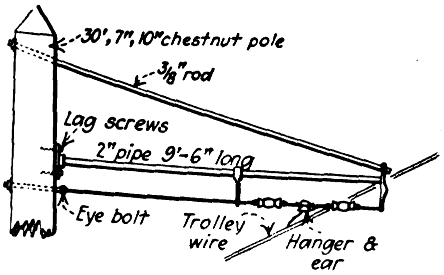
Type	Cost of BSID Poles	Plus per Cent. of BSID Poles	Plus Part Cost of BSID Poles	Cost of 1000 ft. BSID Less Poles	Cost of Joint Construction	
					Per 1000 ft.	Per mile
BSID BJ$_2$ID BJ$_3$ID BJ$_4$ID	$342.50	$100.0 62.5 50.0 33.33	$342.50	$295.27	$637.77	$3,367.43

Per Poles							Per 1,000 ft. Section					
No.	Each	F.O.B.	FCW	A. I.	Total	Item	Size	Quan.	F.O.B.	FCW	A I.	Total
1	$24.10	$24.10	$1.55	$8.60	$34.25	Iron poles (caps, gds., conc. & S. W.)	No. 3-30 ft.	10	$241.00	$15.50	$86.00	$342.50
2	.19	.38				Pole Bands	5 in.	20	3.80			
2	1.26	2.52				Bracket arm, middle and end casting	2 in.x9.5 ft.	20	25.20			
1	.20	.20				Pole casting	5 in.	10	2.00			
2	.35	.70				Over suppt. rod, thrd. nuts, washers	⅝ in. x 11 ft.	20	7.00			
4	.16	.64				Wood strain insulators	9 in. E	40	6.40			
30 ft.	.009	.27				Span wire	5/16 in.	300 ft.	2.70			
2	.368	.73				Straight line hanger		18	6.57			
		5.44	.27	2.00	7.71	Brackets complete, less two hangers			53.67	2.70	20.00	76.37
						Strain complete		2				15.90
						Suspended trolley wire	2,000 ft.					174.50
						Truck or line car 3 days on poles 0.8 days on wire					7.50	28.50
						Finished construction		1,000 ft.				$637.77

5. Span construction, Sole ownership, Wood poles, Single track = SSWS
6. Span construction, Sole ownership, Wood poles, Double track = SSWD
7. Span construction, Sole ownership, Iron poles, Single track = SSIS
8. Span construction, Sole ownership, Iron poles, Double track = SSID

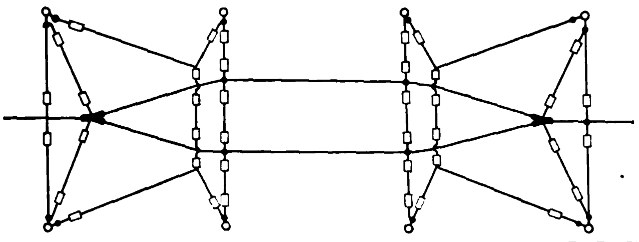
Differences in cost between the rigid and flexible bracket and between double brackets on center poles and long brackets on side-location poles for double track were insignificant and therefore ignored. The cost of a thousand-foot section of each one of these types was then tabulated, the arrangement conforming to the actual subdivision of the work during assembly and construction. Figures 1 to 4 show the tabulated costs for some of the types. The table in the upper right hand

FIG. 4—COST OF BRACKET CONSTRUCTION, WOOD POLES, SINGLE TRACK



Type	Cost of BSWS Poles	Plus Per Cent of BSWS Poles	Plus Per Cent Cost of BSWS Poles	Cost of 1000 ft. BSWS Less Poles	Cost of Joint Construction	
					Per 1000 ft.	Per Mile
BSWS BJ$_2$WS BJ$_3$WS BJ$_4$WS	$79.40	100 62½ 50 33⅓	$79.40 49.60 39.70 26.47	$151.69	$231.09 201.29 191.39 178.16	$1220.15 1062.81 1010.54 940.68

Per Bracket							Per 1,000 Ft. Section					
No.	Each	All	F.C.W.	A. I.	Total	Item	Size	Quan.	F.O.B.	F.C.W.	A. I.	Total
1	$3.25	$3.25	$1.34	$3.35	$7.94	Chest. poles (shaved, treated, set)	30 ft.	10	$32.50	$13.40	$33.50	$79.40
1	1.395	1.395				Bracket arms plus castings	2in.x9.5ft.	10	13.95			
1	.089	.089				Eyebolts and washers	⅝x12 in.	10	.89			
2	.015	.03				Lag screws	⅜x4 in.	20	.30			
2	.16	.32				Wood strain insulators (no clevis)	9 in. E	18	2.88			
15	.009	.135				Span wire	5/16	150 ft.	1.35			
1	.368	.368				Straight line hanger		9	3.31			
1	.35	.35				Over suppt. rod (thrd. nuts, washers)	⅝x11 ft.	10	3.50			
		2.687	13	1.10	2.917	Brackets complete (less one hanger)		10	26.18	1.31	11.00	38.49
	.39					Strain plates	15 in.	1	.39			
	.21					Wood strain insulators (with clevis)	9 in. E	8	1.68			
	.009					Anchor wire	5/16	400 ft.	3.60			
						Strain complete (one in 1,000 ft.)			5.67	.28	2.00	7.95
	.162		.01		.172	Trolley wire, 1,000 ft		453 lb.	73.39	4.53		
	.26					Ears		9	2.34	.09		
				.007		Suspended trolley wire			75.63	4.62	7.00	87.25
						Truck or line car, 2 days on poles, 0.4 days on wire		2.4			7.50	18.00
						Finished construction		1,000 ft				$231.09



Item	Size	Quantity	Each, F.O.B.	Total, F.O.B.	F.C.W.	A.I.	Total
Chestnut poles	30′	8	3.25	26.00	10.73	26.80	$63.52
Eyebolts, nuts, washers	⅜x12″	12	0.089	1.07	0.05	.....	.....
Backbone, 7 strand	¼″	480′	0.006	2.70	.90	.....	.....
Pull-off, 7 strand	5/16″	450′	0.0072	3.24	1.71	.....	.....
3-bolt clamps	.....	.....	.....	.....	.....	.....	.....
Wood-strain insulators		40	.16	6.40			
Straight line hangers	9″ E	6	.368	2.21	.76	.....	.....
Double-curve pull-overs	.....	4	.444	1.77			
V-frogs	.....	2	2.50	5.00			
Turnout (less trolley and ears)	.....	.....	.....	22.39	3.42	22.70	48.51
Trolley wire, 700 ft	.....	317 lb.	.....	51.35	3.17	.....	.....
Ears	.....	10	.26	2.60	.10	.....	.....
Suspended trolley wire	.....	.....	.....	53.95	3.27	6.30	63.25
Truck or line car, 1 day	.....	.....	.....	.....	.....	.....	7.50
Finished turnout	.....	.....	.....	.....	.....	.....	$183.50

Detail of labor on spans,			
102 splices	at	$0.15 =	$15.30
2 frogs	at	1.50 =	3.00
10 spans	at	.20 =	1.60
12 eyebolts	at	.20 =	2.40
			$22.70

FIG. 5—DIAMOND TYPE TURNOUT—SPAN CONSTRUCTION

corner shows the values allowed for joint pole use, incorporating the ratios previously referred to. Of course where poles are jointly used on one side and solely owned and occupied on the other in the case of span construction, the average for the corresponding pole values applies. A similar average is taken where the poles may be iron on one side and wood on the other. Where double trolley wire was in use over single track, the extra cost (1910-1915 prices were employed throughout the entire valuation) were practically $100 per thousand feet. Proper adjustments were also made for cases where span wires were attached to buildings or bridge structures.

Having established these types, a trial of reliability was made by applying the proper types to a 2-mile rural line which the company had inventoried in great detail. The company on its own pricing claimed a value of $2,643.19 and the result of applying the types was $2,629.50. Some will be inclined to claim that the agreement is too good to be convincing.

The actual length of turnouts shorter than 400 feet was ignored, the value assigned being that for the average 300-ft. turnout; there is also little difference in cost between diamond and jacknife turnouts of that length as will be seen by reference to Figs. 5 and 6. Longer turnouts were treated as double track with turnout ends.

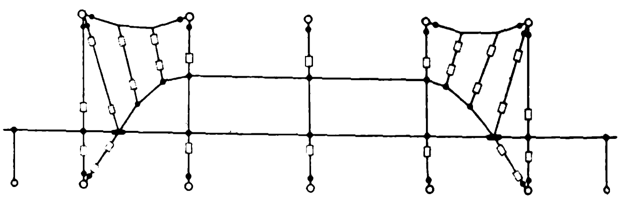
In dealing with the overhead special work, it was recognized that there would be appreciable deviation from right angles at intersections, varying length of approach and curve, unsymmetrical pole locations, etc., but the errors in averaging these factors and even in ignoring joint use of poles in connection with the special work could not accumulate to a significant total. In the case of some kinds of special work the main line mileage for the adjacent tangent construction was taken through the special work, the value of which is then the excess over tangent construction. In other cases the mileage of tangent construction was taken to and from the special work because the special work involved considerable complexity and extra poles for its support.

With the types and symbols thus adopted for the contact system (and also signals, telephones and feeders) the next move was the field inspection for the purpose of listing the construction. An inspection car with an observation end was used, so routed as to keep that end forward as much as possible, and so scheduled as to permit stops for special inspections when deemed necessary. All sorts of identifying notations were made for recording the points where the construction changed in some respect — street intersections, pole numbers, bridges, and even a letter on an enlarged state topographical map when other means failed. The following few lines will show the general nature of the simple field notes necessary to list by symbols and identify the locations of the various kinds of overhead construction:

Fairfield Avenue Line	Distribution	Feeders
(Two blocks HTS; 1 to T.O. then 1 to end of line; both on 2-pin arms)		
End of line to White St. T.O. (T.O. = 275 ft.)	SSIJ$_3$WS	0
White St. T.O. to C (Map 21)	SSIJ$_3$WS	0
C to Fairfield Ave., double track	SSIJ$_3$WS	1
On double track to New Britain Ave. Jnc.	SSIJ$_3$WD	1

The point C was noted as the end of the feeder. The parenthesis refers to a hand-thrown signal and circuit. The poles were solely owned iron ones on one side and three-party joint wood poles on the other side.

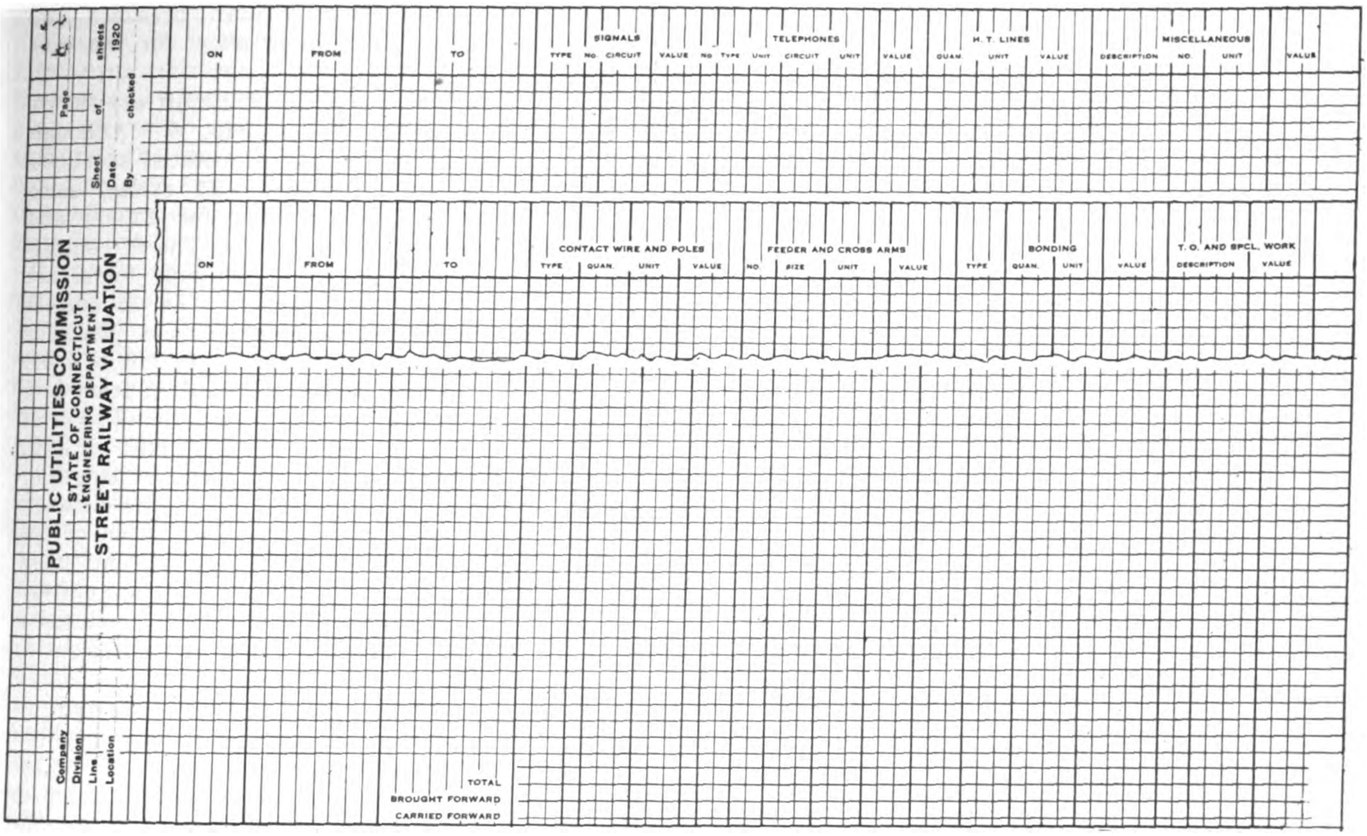
The form used for listing and totaling the contact system, feeders, special work and bonding is shown in Figure 7. It is felt that this form will give ample evidence of the possibility of ascertaining with little effort



Item	Size	Quantity	Each, F.O.B.	Total, F.O.B.	F.C.W.	A.I.	Total
Chestnut poles	30′	10	3.25	32.50	13.40	33.50	$79.40
Eyebolts, nuts, washers	⅜x12″	14	0.089	1.25	0.06	.....	.....
Backbone, 7 strand	¼″	120′	0.006	0.72	0.24	.....	.....
Pulloff, 7 strand	5/16″	650′	0.0072	4.68	2.47	.....	.....
3-bolt clamps	.....	8	0.20	1.60	.....	.....	.....
Wood strain inculators	9″E	26	0.16	4.16	.....	.....	.....
Straight line hangers	.....	8	0.368	2.94	.....	.....	.....
Single-curve pullover	.....	4	0.41	1.64	0.72	.....	.....
Right-hand frog	.....	1	2.00	2.00	.....	.....	.....
Left-hand frog	.....	1	2.00	2.00	.....	.....	.....
Turnout (less trolley and ears)	.....	...	......	20.99	3.49	19.85	44.33
Trolley wire, 650 ft	.....	294 lb.	0.162	47.63	2.94	.....	......
Ears	.....	12	0.26	3.12	3.12	.....	......
Suspended trolley wire	.....	...	......	50.75	3.06	4.55	58.36
Truck or line car, 1 day	.....	...	......	.....	.....	.....	7.50
Finished turnout	.....	...	......	.....	.....	.....	$189.50

Detail of labor on spans,			
83 splices	at	$0.15 =	$12.45
2 frogs	at	1.50 =	3.00
8 spans	at	.20 =	1.60
14 eyebolts	at	.20 =	2.80
			$19.85

FIG. 6—JACK-KNIFE TYPE TURNOUT—SPAN CONSTRUCTION



PUBLIC UTILITIES COMMISSION
STATE OF CONNECTICUT
ENGINEERING DEPARTMENT
STREET RAILWAY VALUATION

Page
Sheet ____ of ____ sheets
Date ____ 1920
By ____ checked ____

Company
Division
Line
Location

ON	FROM	TO	SIGNALS				TELEPHONES						H. T. LINES			MISCELLANEOUS			
			TYPE	NO.	CIRCUIT	VALUE	NO	TYPE	UNIT	CIRCUIT	UNIT	VALUE	QUAN.	UNIT	VALUE	DESCRIPTION	NO.	UNIT	VALUE

ON	FROM	TO	CONTACT WIRE AND POLES				FEEDER AND CROSS ARMS				BONDING				T. O. AND SPCL. WORK	
			TYPE	QUAN.	UNIT	VALUE	NO.	SIZE	UNIT	VALUE	TYPE	QUAN.	UNIT	VALUE	DESCRIPTION	VALUE

TOTAL
BROUGHT FORWARD
CARRIED FORWARD

FIG. 7—THE TWO FORMS USED FOR LISTING AND TOTALING ELECTRICAL PLANT OUTSIDE

the capital investment in the electrical construction for any portion of a given street-car line, of differentiating between distinctly city and rural lines, of obtaining totals for portions of the entire system not necessarily coterminous with the company's divisions as established for operating purposes, and finally of identifying at any time the location of each bit of outside plant construction and the value assigned to it. Granting also the propriety of separating the feeder and cross arms from the contact wire and poles as will be described, the method of listing also keeps distinct from the actual distribution (of localized value) the feeder system which functions primarily to supply not so much the section valued but rather the more remote sections.

FEEDER SYSTEM

The Interstate Commerce Commission classification has "Poles and Fixtures" in one account and "Distribution System" in another, but this separation interferes with an estimate of reproduction cost on a unit-of-construction basis. "Fixtures" include the cross-arms and braces and these are associated with the feeders or signal circuits and not with the contact system. "Poles," on the other hand, are necessary for the contact system even when feeders are absent. Except where the feeders follow an independent route, poles have already been included with the contact system. Cross-arms will thus appear in conjunction with the feeders, enough extra pins being allowed in excess of the feeder requirements to provide space for such signal circuits as appear. Of course feeders may be of aluminum as well as copper, underground or submarine as well as aërial, negative feeders may be used in electrolysis mitigation, many combinations of cross-arm sizes and feeder sizes are to be found, and there are always such accessories as feed taps, circuit breakers, knife switches and section insulators, lightning arresters, meters, etc., but no difficulty was found in dealing with these variations. The company had a complete set of feeder maps which were accurate or could readily be made so and these maps indicated the number and sizes of all feeders, the location of changes in number and sizes, the approximate location of feed taps and the accessories. In a few instances the actual measured length of a feeder was recorded, but in general the lengths were obtained from the mileage maps and the track and paving sheets already mentioned.

The following will indicate the allowances for cross-arm sizes with given numbers of feeders, the spare pins leaving adequate provision for the few signal and telephone circuits:

One to four feeders	One four-pin arm
Five and six feeders	One six-pin arm
Seven to twelve feeders	Two six-pin arms
Twelve to eighteen feeders, etc.	Three six-pin arms, etc.

Allowing for double-arming at corners and dead-ends the cost of four-pin arms per 1,000 ft. of feeder circuit was $14 and for six-pin arms $17. Insulators cost about $2 per 1,000 ft., as an average for all sizes of feeders.

No further progress toward reduction to types could be made than thus to standardize on cross-arm sizes for certain numbers of grouped feeders, the large number of possible combinations pointing rather toward a tabulation of individual feeder costs which could flexibly be applied to any selection likely to be encountered. Table I shows these costs per thousand feet. Two illustrations are offered as showing how this table was used for combinations not directly tabulated.

1. Seven 4/0 plus two 750,000 c.m. feeders.
2. Eight 600,000 c.m., twelve 500,000 c.m., five 4/0.

The combination (1) is treated as two groups (of three 4/0 and one 750,000) each at $960 with an extra 4/0; but two six-pin arms would be used, therefore it is necessary to increase the allowance by $6, the difference

TABLE I—COSTS PER 1,000 FT., INSTALLED, OF FEEDER COMBINATIONS

	+ 0	+ 1 2/0	+ 1 4/0	+ 1 250M	+ 1 300M	+ 1 500M	+ 2 500M	+ 3 500M	+ 1 600M	+ 1 750M	+ 1 1000M
1-4/0	160	257		345	379	508	857	1206	571	667	822
2-	307	404		492	526	656	1005	1357	718	814	969
3-	453	550	599	638	672	802	1154	1503	864	960	1115
1-250 M	199	296	395		418	547	896	1245	610	706	861
2-	384	481	530		603	733	1082	1434	795	891	1046
3-	570	666	716	755	789	919	1271	1620	981	1077	1232
1-300 M	233	330	379	418		581	930	1279	644	740	895
2-	451	548	597	636		800	1149	1501	862	958	1113
3-	670	767	816	855	889	1090	1371	1720	1081	1177	1337
1-500 M	362	459	508	547	581				774	870	1025
2-	711	808	857	896	930				1123	1318	1373
3-	1059	1156	1206	1245	1279				1471	1566	1721
4-	1408	1508	1557	1596	1630				1822	1918	2073
5-	1760	1860	1909	1943	1982				2174	2270	2425
6-	2108	2225	2274	2313	2347	2474	2823	3171	2539	2635	2790
1-600 M	425	522	571	610	644	774	1123	1471		932	1087
2-	836	933	982	1021	1055	1185	1534	1886		1343	1498
3-	1247	1344	1393	1432	1466	1596	1948	2297		1764	1909
4-	1658	1758	1807	1846	1880	2010	2362	2725		2168	2323
5-	2072	2169	2218	2267	2291	2421	2787	3136	2483	2579	2734
1-750 M	521	618	667	706	740	870	1219	1568	932		1183
2-	1028	1125	1174	1213	1247	1377	1726	2078	1439		1690
3-	1535	1632	1681	1720	1764	1884	2236	2585	1946		2197
4-	2549	2649	2698	2737	2771	2901	3250	3616	2963		3214
5-	3062	3159	3208	3247	3281	3411	3777	4126	3473	3569	3724
1-1000 M	676	773	822	861	895	1025	1374	1723	1087	1183	
2-	1338	1435	1484	1523	1567	1687	2036	2388	1749	1845	
3-	2000	2097	2146	2185	2219	2349	2701	3050	2411	2507	
4-	2662	2762	2811	2850	2884	3014	3363	3729	3076	3172	
5-	3327	3424	3473	3512	3546	3676	4042	4391	3778	3834	3989
No cross-arm; with Insulator		97	146	185	219	349	698	1047	411	507	662
No cross-arm or Ins.		95	144	183	217	347	694	1041	409	505	660

	1/0	3/0	350M	400M	700M	1″ Al.	1.21″ Al.	1.24″ Al.
No cross arm; with insulator	79	121	252	284	475	292	403	416
No cross arm or insulator	77	119	250	282	473	290	401	414

between the cost installed of six-pin arms and four-pin arms in the thousand feet. Further the odd 4/0 feeder value is taken as $146, tabulated under "no cross-arm; with insulators," because this feeder will appear on one of the unoccupied pins of the six-pin arms. The total per thousand feet of this combination is $2,072. Group (2) is handled as:

Four 600,000 + one 4/0	$1,807
Four 600,000 + one 4/0	1,807
Nine 500,000	3,171
Three 4/0 + three 500,000	1,503
All on five six-pin arms (per 1,000 ft.)	$8,288

Above the broken line in each block of the table the total number of feeders for each combination calls for a four-pin cross-arm; between the broken and dot-and-dash line a six-pin arm; below the dot-and-dash line two six-pin arms. It should be noted that the portions of the above totals which represent the assumed cross-arms amount to percentages ranging from 1.2 per cent to 1.7 per cent and that any error in the above assumption as to number and size of cross-arms would therefore be well within 1 per cent of the over-all value.

The feeder maps were spot checked as to feeder sizes and the location, number and types of such accessories as circuit breakers, section insulators, knife switches, feed taps, etc. Bracket and span feed taps were priced separately, that one being assigned which corresponded to the contact construction in the section where it appeared. A single average length of feed wire was used with all circuit breakers and knife switches to allow for the vertical runs.

The 147 miles of circuit are shown schematically in Fig. 8. Although all this mileage is operated at 11,000 volts, three-phase, 25 cycles, some lines are insulated for 22,000 and 33,000 working volts. The fifteen different types of pole tops found are shown in Fig. 9. The conductors are of either copper (No. 4, No. 2, or 2/0) or aluminum (1/0, 2/0 or 4/0). Each of the lines, ranging from 8 to 30 miles in length, was found to be of a high degree of uniformity of type either throughout the entire length or for at least a quarter of the distance. This meant that this portion of the street railway property lent itself very advantageously to the unit-of-construction method of estimation first developed for the distribution system.

The lines were built entirely on wooden poles and these poles would at any point be the same whatever the character of pole-top construction or the character of insulators or conductors.

On the other hand, the pole-top construction would be practically independent of poles and conductors. The insulators seem to be more intimately related to the conductors than to the cross-arms. In view of these considerations the analysis was aimed toward a study independently of poles, pole tops and circuits. With the poles in place any one of the established set of types of pole tops would then be erected on these poles to support any type of circuit existing on the system.

The company had on file route maps of the lines and these were found to be accurate as to lengths of lines and numbers of poles, location of special crossings, etc., but did not give the type of pole top nor the height of the individual pole. It was therefore decided to make a quick field inspection to determine the number of poles

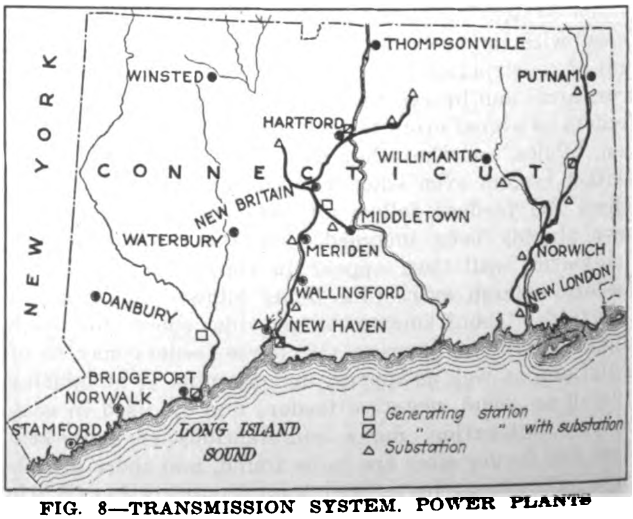


FIG. 8—TRANSMISSION SYSTEM. POWER PLANTS AND SUBSTATIONS

of each size, the number of double cross-arms (at angles, etc.), the number of special crossings (over railroads, other wire lines, etc.), the number of H-frames (at dead-ends and angles), of anchor guys, braces, head guys, and stubs. At the same time the points of transition from one type of pole top or circuit to another could be noted as well as the few irregularities not covered by type treatment.

It was found that the number of poles per thousand feet averaged 9.57, giving an average span length of 104.51 feet, and that the poles were distributed as to size as follows, 10 per cent being set in rock, the remainder in medium earth:

Pole Height, Feet	Poles per 1,000 ft.	Per Cent
35	2.04	21.27
40	5.37	56.17
45	1.36	14.25
50	.48	5.02
55	.18	1.83
60	.09	.94
65	.04	.42
70	.01	.10
	9.57	100.00

The inspection of from 325,000 to 647,080 ft. of line disclosed the frequency of incidental construction to be as follows:

Item	Total	Per 1,000 Ft.
Double cross-arms	906	1.40
Special crossings	301	.49
H-frames	18	.26
Anchor guys	663	2.03
Braces	161	.49

Assembly of the various items in these proportions gave the costs per thousand feet of poles and of each of the types of pole tops. The poles and reinforcement amounted to $211.61 per thousand feet. A thousand feet of "A" pole tops cost $32.70; of "H," $75.58, etc. A similar set-up was made for conductors and insulators.

The ten lines having a total circuit mileage of 147 (with overlap of about 6 miles) were valued at $281,463.61. After adjusting for the overlap, for joint use of poles with trolley contact circuits, and for short sections of cable, the value per mile of single circuit line averages to practically $1,900.

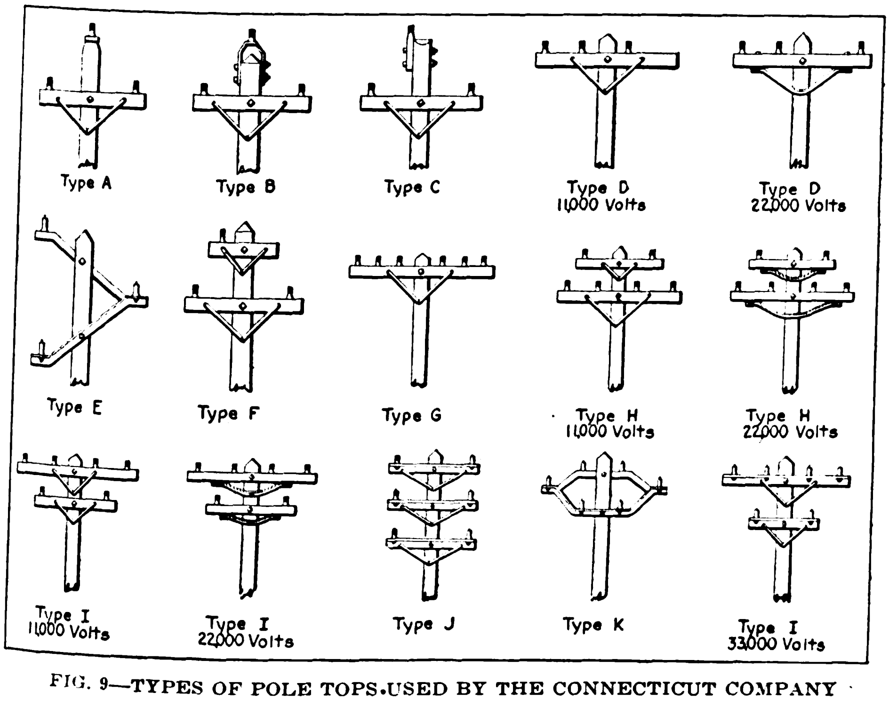


FIG. 9—TYPES OF POLE TOPS USED BY THE CONNECTICUT COMPANY

TABLE II—QUANTITIES OF EXCAVATION AND BALLAST FOR VARIOUS KINDS OF TRACK

Track Excavation — Cubic Yards per 100 Lineal Feet

Wood Ties: Class Track / Rail Height	Single Track 9''	8''	7''	6''	5''	4½''	4''	Double Track 9''	8''	7''	6''	5''	4½''	4
A	77							150						
B	72	69			61	60		149	143			126	123	
C G J	50	47	44	42	39	37	36	106	100	94	88	82	79	76
D F N	58	56	53	50	47	46	44	123	117	111	106	100	97	94
K M					64	62						135	132	
Side Loc. C G J				25	25	25	25				53	53	53	53
" " D F N				33	33	23	23				70	70	70	70

Paving Excavation

Class Paving / Thick	P X₁ P₃ P₄ 9''	P₁ X X₃ 2½''	R 12''	R₁ T₃ R₂ T₄ 5''	S W S₁ W₁ 6''	X₂ 8	T Y₁ 11''	W₂ 4''	P₂ 7''	T₂ 10''	Pockets Under Rail X₁ W₂	$\overline{V}$ Z
Single Track	25	7	33	14	17	22	31	11	19	28	1.3	0
Double Track	53	15	70	29	35	47	65	23	41	58	2.7	0

Ballast

	A	A₂	A₃ A A₄	B	C G J	D F N	K M	Side Location	R.R. Section
Single Track				22.8	0	28.4	45.1	28.4	34
Double Track	46.0	44.2	48.2	48.6	0	60.5	95.7	60.5	66

Ballast Variation - Paving not same thickness as Rail height

	Decrease - Paving Thicker 1''	2''	3''	4''	5''	6''	Increase - Paving Thinner 1''	2''	3''	4''	5''	6''	Pockets under Rail Deduct.
Single Track	1.95	3.9	5.9	7.8	9.8	11.7	2.8	5.6	8.4	11.1	13.9	16.7	1.3
Double Track	4.2	8.4	12.7	16.9	21.1	25.3	5.85	11.7	17.6	23.4	29.3	35.1	2.7

Signals, telephones and rail-bonding proved susceptible to the same general reduction to type. Signal and telephone circuits were priced on a thousand-foot basis, no allowance being made for cross-arms since spare pins for these circuits were contemplated in pricing the feeders. Four distinct types of signal devices and four telephone station types were found and the costs of these determined separately from the circuits. Similarly the cost per hundred feet of bonding each length of rail, single or double track with each type of bond, from the short U-type to the long 48 in., was tabulated and applied to each section according to the recorded bonding. It is shown that the bonding of special trackwork required special treatment.

TRACK AND ROADWAY

In attacking the problem of the track and paving costs it was found that the company's engineer of maintenance of way had records which gave in great detail the character of track construction from point to point on the system. It was based on a classification which employed a letter to indicate the nature of sub-foundation and ballast and a numeral to indicate the weight and length of rail, kind of ties and kind of joint. The listing sheets were segregated by divisions, routes and towns and gave to the nearest foot the length of each uniform combination of sub-foundation, ballast, track and paving. The points of change were identified by various methods—names of cross-streets, the approximate distance from the last named cross-street, special trackwork, railroad crossing, town line, etc. These same sheets have already been mentioned as of considerable value in determining lengths of overhead electrical construction. It has also already been stated that special trackwork was recorded by serial number on individual detailed maps giving all dimensions and such other information as was necessary for pricing purposes. No difficulty was experienced in co-ordinating the special trackwork information with that for tangent track appearing on the track and paving sheets in such a manner as to differentiate wholly between the two as to distances and values.

These records simplified the field work with reference to track to a greater extent, in proportion, than was the case with the electrical outside plant.

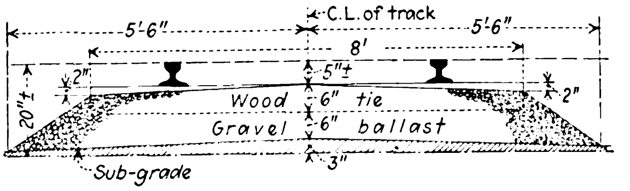
To reduce the tangent track construction to a type basis for the purpose of applying the "unit of construction" method of valuation, the classification established by the company was somewhat enlarged to symbolize all the elements involved. The letters adopted and their significances as to foundation and ballast are as follows:

A	Concrete mat sub-foundation
B	Telford sub-foundation
C, G, J	On native material suitable for ballast
E	On bridge
D, F, N	On sub-foundation of native soil not suitable for ballast, requiring the placing of either gravel or stone ballast. The ballast differentiates between the three letters.
K, M	Special types, one a sub-foundation of stone, the other of cinders

An excavation and ballast table (Table II) was first prepared to show the cubic yards of track excavation per hundred lineal feet of track for each combination of sub-foundation, rail height and paving. The costs of excavating for the full depth of track construction and for pavement differ and for that reason the quantities involved are shown separately in the two upper tables of the figure. The same table shows in the third subdivision the varying quantities of ballast involved with the different conditions of sub-foundations and ties. The fourth subdivision (at the bottom of the table) shows corrections to be applied to ballast quantities when the paving and its foundation are not of the same total thickness as the height of the rail. Applying the proper unit prices to the quantities for each kind of track as determined by reference to this table and tabulating, the results were then in convenient form for use in assigning costs of excavation and ballast for any combination of track and paving.

TABLE III—ESTIMATED COST OF 100 LINEAL FEET IN VARIOUS PAVEMENTS
(1910-1915 prices)

Classification	Paving	Cost Single Track	Cost Double Track
A-1	P	541.77	1,046.82
B-2	S	368.07	723.59
C-3	V	209.53	423.17
C-3	X	238.86	485.17
D-4	R	344.92	702.00
F-4	T	295.24	601.79
H-1	P	......	1,196.46
J-15	R_1	166.80	337.71
K-2	—	254.58	522.37
M-1	Z	232.77	475.04



ESTIMATED COST OF 100 LINEAL FEET OF SINGLE TRACK

Item	Unit	Rate	Quantity	Amount
Rail—T 5 in., 80 lb., 33 ft.....	Tons	$35.00	2.381	$83.34
Splices—Angle 30 in., 6 bolt...	Complete	1.17	6.6	7.72
Spikes.....................	Pounds	.02	120	2.40
Ties—native wood...........	Each	.65	50	32.50
Track labor.................	Lineal feet	.35	1.00	35.00
Ballast—gravel.............	Cubic yard	.60	32	19.20
				$180.16
Contractor's profit............				8.75
Total.....................				$188.91

FIG. 10—TRACK TABLE FOR TYPE J22

Unfortunately the numerals adopted by the company to signify the particular combination of rail section, tie and joints were not uniform for the various letter groups representing the character of sub-foundation and ballast. Thus A-1 means a 9-in., 125-lb., 60-ft. rail on wood ties and a 6-in. concrete mat foundation, the whole ballasted with stone; while C-1 means a 9-in., 84-lb., 50-ft. rail on wood ties on native soil with native soil ballast. But for the engineers of the commission to have attempted reclassification with a view to numeral standardization would have resulted in complication and delay. This accounts for the apparent inconsistency of the classification.

TABLE V—PAVEMENT CLASSIFICATION

Class	Thickness	Foundation	Surface
P	9 in.	6 in. concrete	2½-3 in. asphalt
R	12 in.	6 in. concrete	Granolithic Block
R_2	5 in.	Earth	Granolithic Block
S	6 in.	Macadam	Macadam
T	11 in.	6 in. concrete	Brick
V		Earth	Earth
W	6 in.	6 in. concrete	6 in. concrete
W_3	6 in.	6 in. hassam	6 in. hassam
X	2½ in.	Stone	Amiesite
Z		Cinders	Cinders
—		No paving (open track)	

The last letters of the alphabet were used to indicate the character of paving surface, with supplementary numerals for subscripts to designate variations under the principal group:

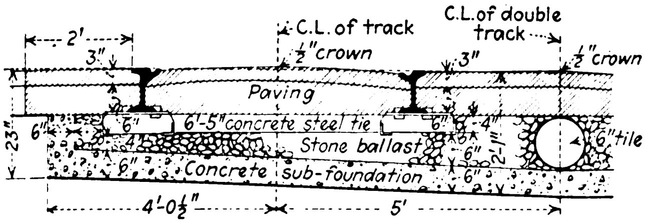
P = asphalt V = native soil Y = wood
R = granite W = concrete Z = cinders
S = macadam X = amiesite — = no paving.

Some 160 different combinations of foundation, ballast and track were recognized and some 30 of paving. Actually over 400 different combinations of track and paving were found, but from the standpoint of cost to reproduce, so many of these were practically identical

TABLE IV—TRACK CLASSIFICATION

Class	Sub-Foundation	Ballast	Ties	Weight	Rail Section	Length	Joint
A-1	6 in. Concrete	Stone	Wood	9 in., 125 lb.	P. S. 273	60	C 12 bolt
B-2	Telford	Stone	Wood	9 in., 84 lb.	L. S. 229	60	C 8 bolt
C-3	Earth	Earth	Wood	5 in., 80 lb.	P. S. 251	60	L 6 bolt
D-4	Sand and Gravel	Stone	Steel Conc.	6 in., 100 lb.	P. S. 163	60	Continuous 6 bolt
F-4	Earth	Stone	Wood	7 in., 70 lb.	P. S. 206	30	C 8 bolt
H-1	Concrete Beam	None	Wood	9 in., 104 lb.	P. S. 260	30	Lorain Weld
J-15	Gravel	Gravel	Wood	4½ in., 56 lb.	P. S. 51	30	L 4 bolt
K-2	Stone	Stone	Wood	4½ in., 70 lb.	Beth. 37	30	L 6 bolt
M-1	Cinders	Cinders	Wood	4½ in., 70 lb.	P. S. 237	30	L 4 bolt

In the "joint" column, a channeled joint bar is indicated by "C," an angle bar by "L"; the number of bolts employed also appears in this column.



ESTIMATED COST OF 100 LINEAL FEET OF DOUBLE TRACK

Item	Unit	Rate	Quantity	Amount
Rail—G.G. 9 in., 125 lb., 50 ft., 60 ft.	Tons	$40 00	7.440	$297.60
Splices—Channel, 32 in., 12 bolt	Complete	2.75	8	22.00
Tie rods—7. ft. centers	In place	0.43	27 2	11.70
Ties—steel concrete, 6 ft	Each	5.00	32.6	163.00
Track labor	Lineal feet	.55	200	110.00
Concrete sub-foundation	Cubic yard	5.00	36.0	180.00
Excavation—paving	Cubic yard	1.75	53	92.75
other	Cubic yard	.80	81	64.80
Drainage—6 in. V.T. pipe	Lineal feet	.20	100	20.00
—catch basins	Complete	30.00	0.17	5.10
Ballast stone	Cubic yards	1.20	44.2	53.04
				$1,019.99
Contractor's profit				71.49
Total				$1,091.48
Paving—Asphalt on concrete	Square yards	2.14	211	451.54

FIG. 11—TRACK TABLE FOR TYPE A2-P

that it was found easily possible to reduce the necessary number of standard types to 50. To indicate the nature of a few of these combinations and the corresponding costs per hundred lineal feet of either single or double track, Table III is given.

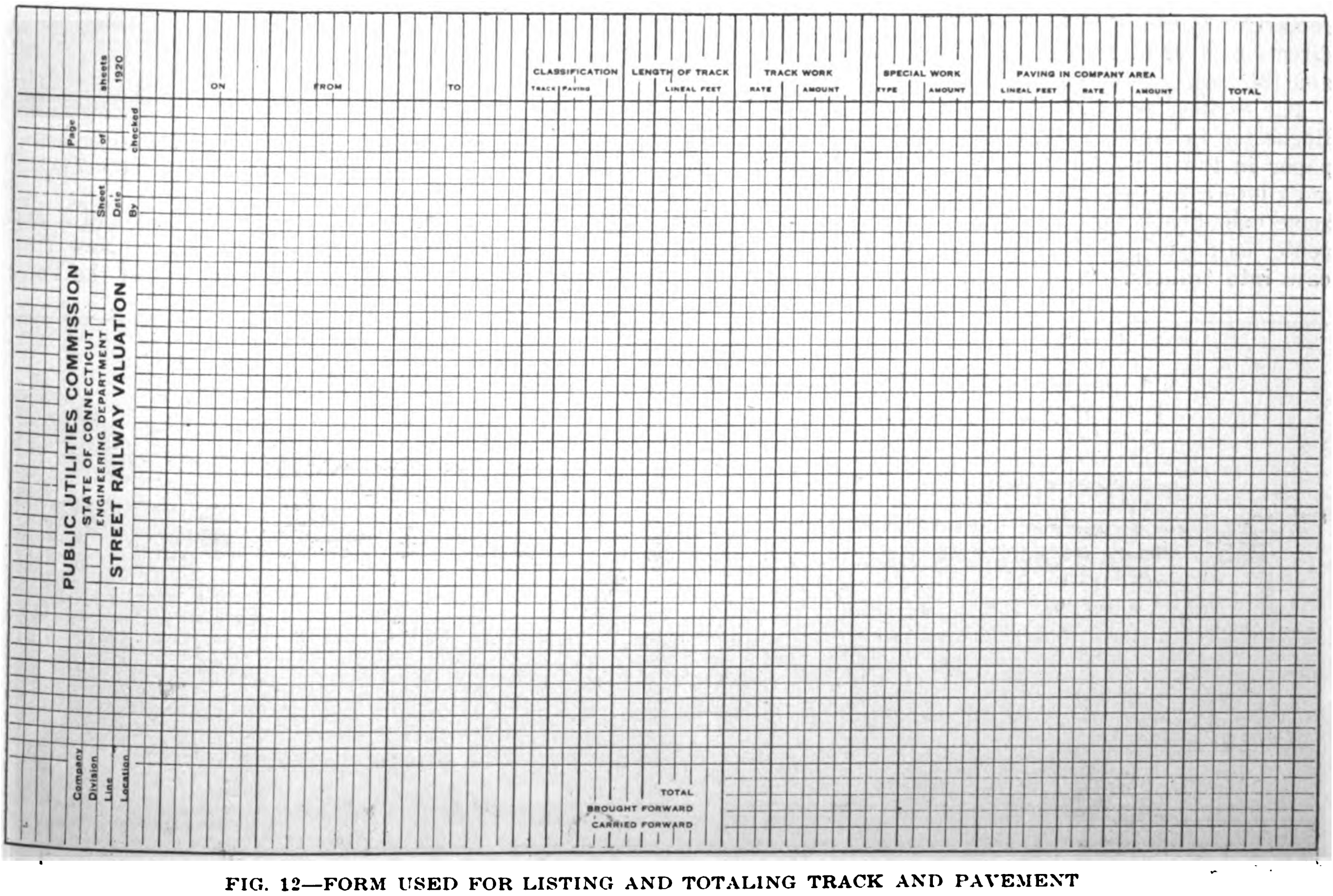
In addition, Table IV exhibits the separate details of excavation, ballast and track, and Table V shows the details of paving.

As an indication of the manner in which the over-all cost of the fundamental combinations of track and roadway were assembled there are given two examples out of the 50 standard types. One (Fig. 10) is an inexpensive rural track and the other (Fig. 11) an expensive city track and pavement.

It is naturally not possible in an article of this length to give the costs and quantity data in any greater detail, but it is believed that enough has been set forth to indicate that the value of the track and roadway investment can by this method be estimated with a minimum of approximation. In addition it is possible to list the property with its assigned value in such a way as to permit absolute identification of each stretch of track in the pricing sheets, as sample shown in Fig. 12. This is similar to the electrical overhead listing sheets, Fig 7.

CONCLUSION

Some of the aspects of the ordinary physical valuation questioned in the former article were the cost, the length of time taken, the uncertainty as to labor costs in connection with the multiplicity of small items, and the inflexibility of the summary as to rational apportionment of the total value among subsequent subdivisions of the property. Superior in the mind of the writer to these objections to an expensive detailed appraisal is the insignificance of appreciable variations in the physical totals when it comes to the actual determination of the reasonable rate. It is felt that the method outlined in this and the previous articles avoids most of these objections and has in addition the advantage, at least in connection with the outside plant, of identifying the location of each piece of valued property and thereby assuring that the errors of omission are at a minimum. Even though the cost of making this appraisal was no more than 10 or 12 per cent of what a detailed-count appraisal would have cost, those who ordered the work as well as those who performed it felt confident that the totals arrived at are just as reliable as if the larger amount had been spent.


PUBLIC UTILITIES COMMISSION
STATE OF CONNECTICUT
ENGINEERING DEPARTMENT
STREET RAILWAY VALUATION

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ON
FROM
TO
CLASSIFICATION: TRACK | PAVING
LENGTH OF TRACK: LINEAL FEET
TRACK WORK: RATE | AMOUNT
SPECIAL WORK: TYPE | AMOUNT
PAVING IN COMPANY AREA: LINEAL FEET | RATE | AMOUNT
TOTAL

Company
Division
Line
Location

TOTAL
BROUGHT FORWARD
CARRIED FORWARD

FIG. 12—FORM USED FOR LISTING AND TOTALING TRACK AND PAVEMENT

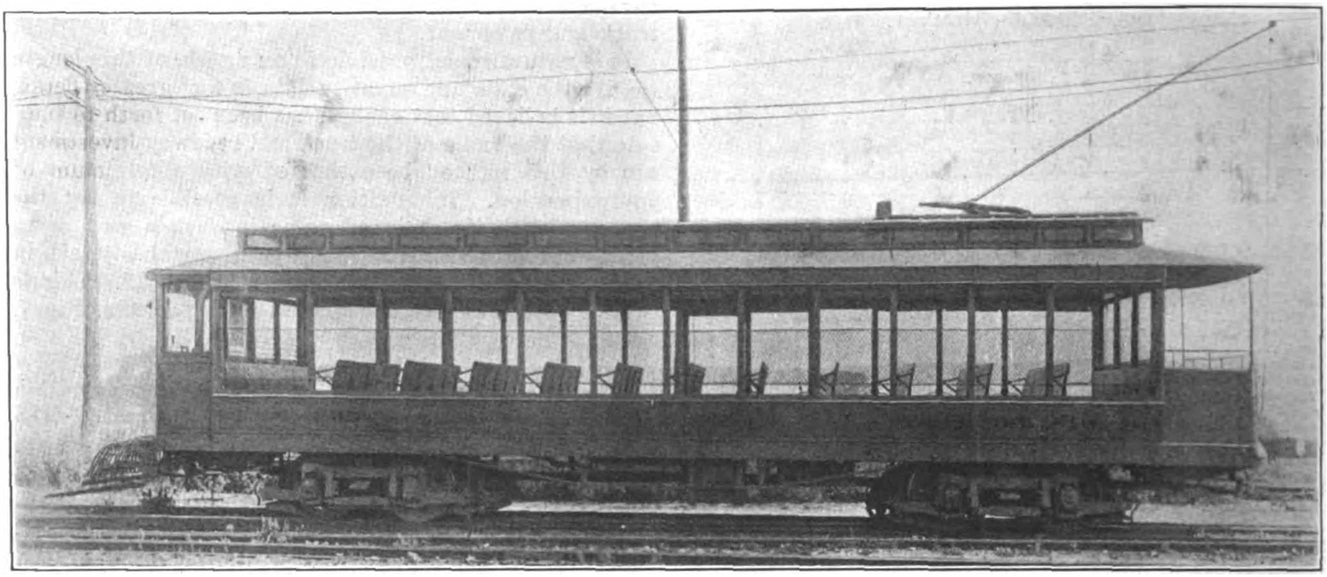

FIG. 1—NINE TRAILER CARS OF THIS TYPE WERE REMODELED BY THE NEW YORK STATE RAILWAYS INTO FRONT-ENTRANCE, CENTER-EXIT CARS

Adapting Cars to Transportation Requirements

New York State Railways Is Gradually Changing Over Rolling Stock to Provide for More Efficient Passenger Interchange and Fare Collection—Latest Examples are Cited

DURING more than four years just past the mechanical department of the New York State Railways has been carrying out a consistent program of remodeling the rolling stock used on the Rochester, Syracuse, Utica and Oneida lines. War and post-war conditions interfered with the continuity of the process, but remarkable results have been accomplished under the direction of J. F. Uffert, superintendent of equipment, and the local master mechanics.

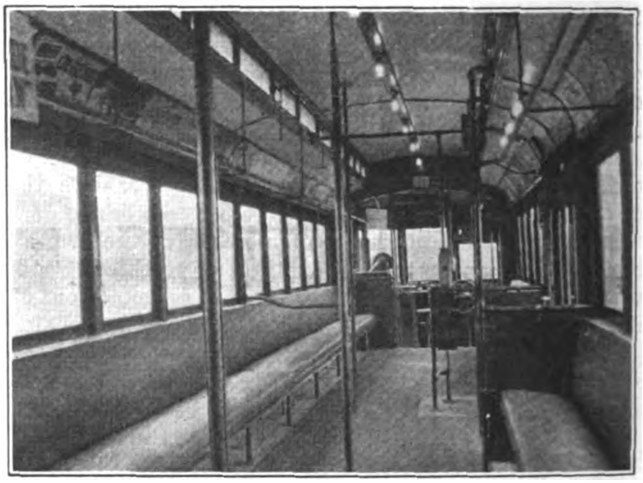

FIG. 3—INTERIOR OF THE FIRST CAR REMODELED FROM TRAILER TO FRONT-ENTRANCE, CENTER-EXIT TYPE

The earliest and largest job was that inaugurated in Rochester in April, 1917, covered in an article in this paper in the issue for April 20, 1918, page 773. The most interesting recent two jobs are the making over of some open-bench cars into those of the front-entrance, center-exit type and the remodeling of a batch of motor cars into trailers. "Before and after" pictures of the first of these jobs are reproduced in Figs. 1 and 2, and interiors are shown in Figs. 3 and 4. As the New York State Railways operates a number of cars of the Peter

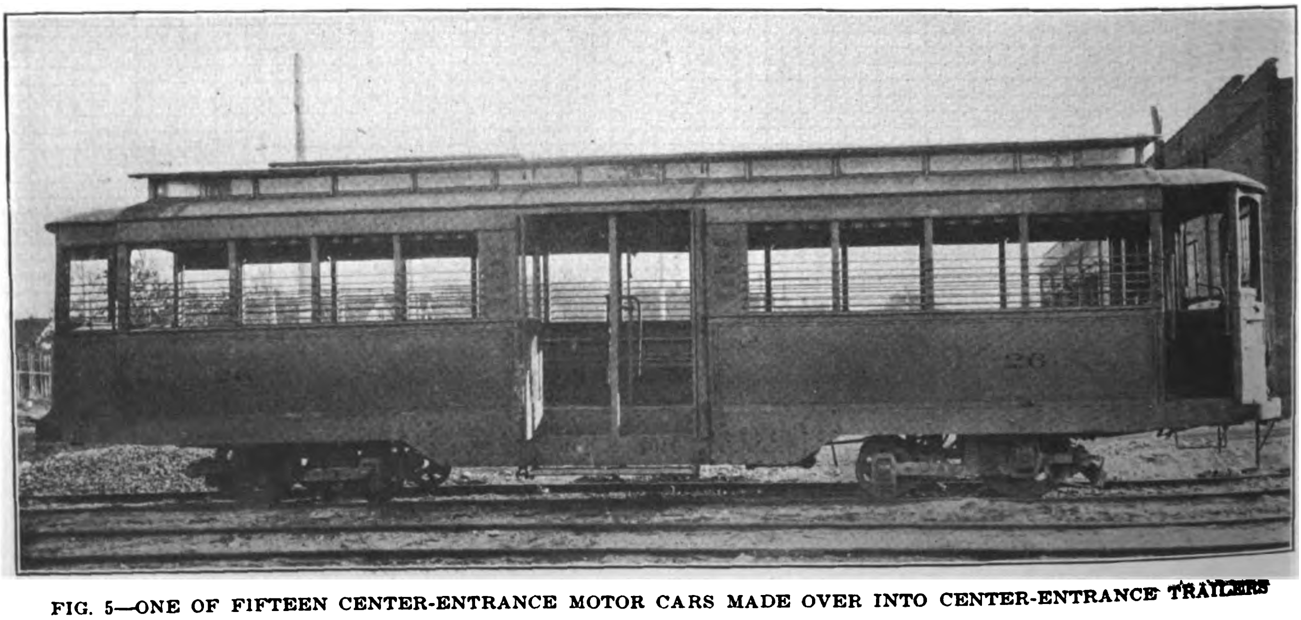

FIG. 5—ONE OF FIFTEEN CENTER-ENTRANCE MOTOR CARS MADE OVER INTO CENTER-ENTRANCE TRAILERS

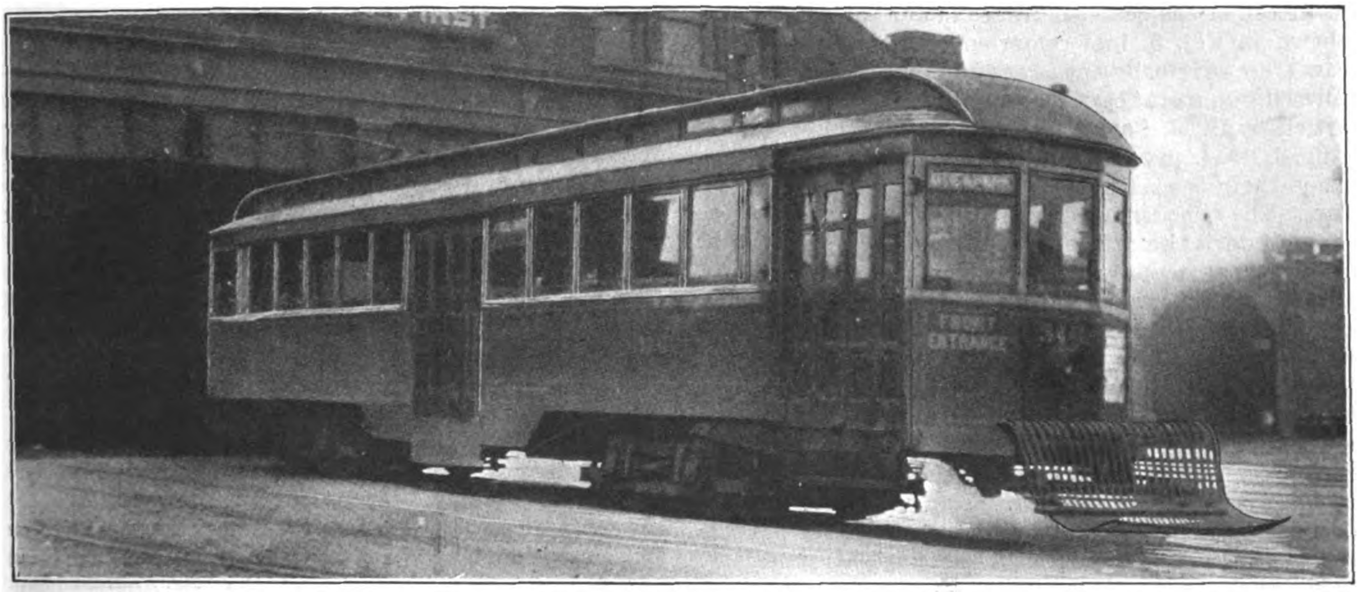

FIG. 2—THIS IS THE FRONT-ENTRANCE, CENTER-EXIT CAR MADE OVER FROM THE OPEN TRAILER ILLUSTRATED IN FIG. 1

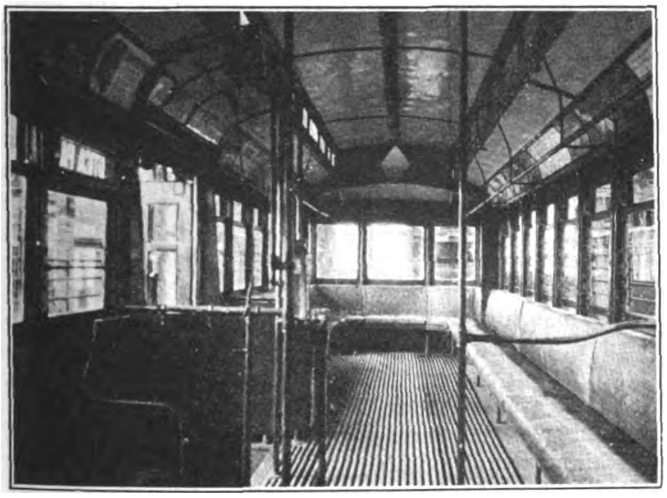

FIG. 4—INTERIOR OF REMODELED CAR EMBODYING IMPROVEMENTS OVER THE SAMPLE CAR

Witt type (see issue of this paper for Jan. 19, 1918, page 120), the experience with which has been highly satisfactory, the present remodeling is a logical development. Advantage has been taken of several years of operating experience with these cars on the property to incorporate into the present cars the latest ideas in regard to details.

The old open cars were of very light construction, in fact the underframing was so light that sagging had occurred at both ends. It was necessary to reinforce the underframe, which was done by transferring the original ⅜-in. x 8-in. steel plates from the entrance side to the devil-strip side, thus nearly doubling the strength of the sill there, and putting in a ½-in. x 12-in. plate to reinforce the sill on the entrance side. The interior arrangement was made similar to that on the company's other front-entrance, center-exit cars.

Figs. 3 and 4 show some differences in regard to windows, hand rail and floor. The interior shown in Fig. 3 is that of the first of the nine cars remodeled. This has stationary window sash and the floor is slatted crosswise. In Fig. 4 the features of difference are the movable sash equipped with fittings, the handrail offset over the seats and the longitudinally slatted floor.

The cost of this job was about $1,650 per car.

The second job is also illustrated in "before and after" fashion in Figs. 5 and 6. This involved the making over

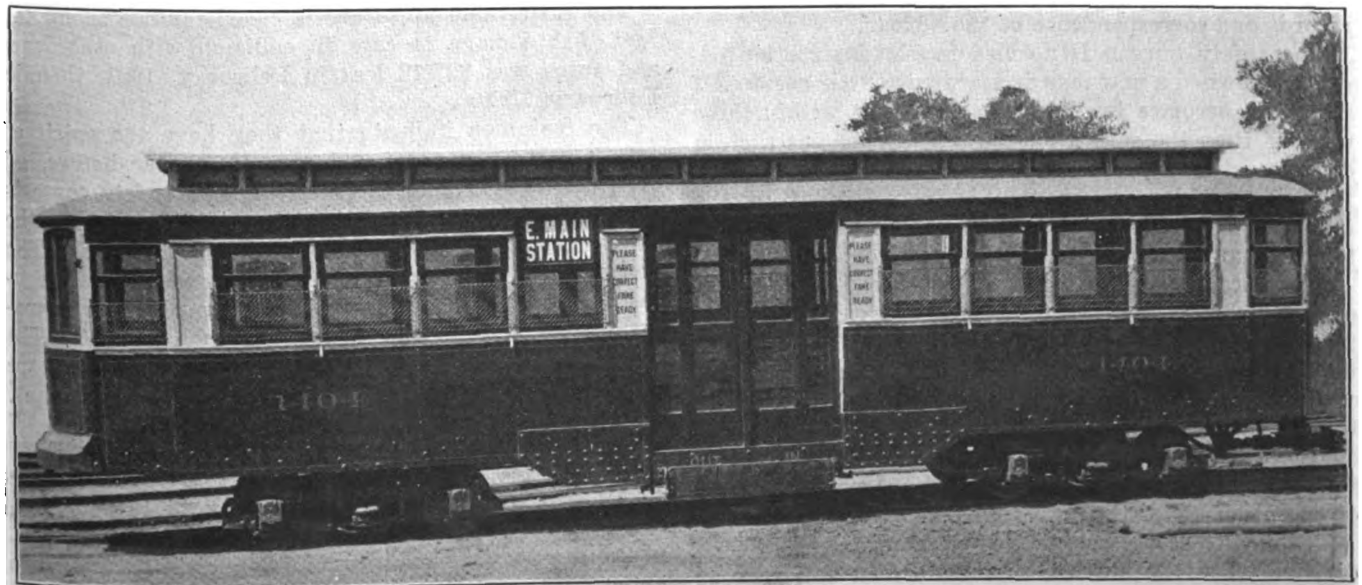

FIG. 6—THE FINISHED CENTER-ENTRANCE TRAILER MADE FROM A CENTER-ENTRANCE MOTOR CAR

of fifteen of the center-entrance motor cars of the type shown in Fig. 5, into center-entrance trailers. These cars were originally open cars but they had been transformed into motor cars for supplementary service. (See article by G. M. Cameron in the issue of this paper for Aug. 1, 1914, page 216.) Present operating conditions made their use as trailers preferable to use as motor cars. The remodeling comprised principally the refitting of the interior to utilize the full seating capacity (now fifty-three); to provide stanchions for convenience of passengers in boarding and alighting, and to standardize the window sash and fittings. In addition Peter Smith hot-air heaters were installed; the hand-brake and air-brake equipment was revised, the space under the seats being utilized for all possible elements of the braking system; couplers were added; the cars were completely repainted, and last, but not least, Taylor trucks with 26-in. wheels were installed. The Taylor trucks are designed to accommodate motors to provide for possible changes in service requirements making this necessary.

The changes mentioned reduced the car weight from 27,000 to 22,000 lb. They cost about $2,200 per car, the subdivision of items being approximately thus: Shopwork, $800; air-brake equipment, $400; trucks, $1,000.

Accomplishments of a Safety Bureau

Accidents Involving Responsibility of Trainmen Materially Reduced—The Same Is True of Damages to Other Cars and Automobiles

By J. G. Jeffery
Director of Public Relations Los Angeles Railway

AN EXTENSIVE safety campaign embracing close co-operation between trainmen, the riding public and traction officials has resulted in a marked reduction of all classes of accidents on the Los Angeles (Cal.) Railway. Particularly gratifying results have been obtained in lowering the number of accidents in which the company could be held liable. This safety work has been under the direction of a Safety Bureau created Oct. 1, 1920.

The bureau staff consists of a supervisor of safety, who closely analyzes all accident reports to determine the particular classes of accidents that need special attention, and a traveling supervisor of safety, who spends the greater part of his time on the cars observing operation and instructing trainmen. Two clerks handle the records and correspondence of the bureau.

The safety bureau is notified by the instruction department when a new man is accepted for car service. If such man becomes involved in an accident within three months' time the safety bureau notifies the instruction department when investigation shows the trainman at fault in any degree. A man is then detailed by the instruction department to ride with the new trainman to check up his abilities for safe operation.

When accident reports indicate continued carelessness or inefficiency on the part of a man in service more than three months he is either called to the office and the matter discussed with him or the traveling supervisor of safety rides with him on the car. The latter method has proved highly beneficial. It gives the trainman a chance to show actual difficulties as they occur and the safety expert an opportunity to show correct methods of operation under the actual traffic conditions.

Trainmen's safety committees were organized in each division when the bureau was established and regular meetings were conducted at the carhouses. These meetings for a time brought forth good suggestions, but were later abandoned as they were inclined to develop more controversy than actual beneficial suggestions. However, those that were interested in safety were invited to visit the headquarters of the bureau and discuss features of accident prevention. One of the features of the company's weekly publication are articles by the traveling supervisor of safety prepared in interesting style and in trainmen's language.

Under the company's merit system, upon which the Christmas bonus is based, credits are given for good safety suggestions and for reports of dangerous conditions. This helps particularly in keeping rolling stock in proper mechanical repair. There is also a special award of ten credits for a month's clear safety record.

A gratifying degree of co-operation from auto drivers has resulted from carrying large signs on the dashers of all cars reading, "Autos turn out; we can't." At the same time pointed safety reminders were printed on small cards and hung in the cars. The safety bureau has also been successful through the Los Angeles chapter of the National Safety Council in enlisting the co-operation of the local civic bodies. As an indication of the improvement in safety conditions the safety bureau has compiled the following figures:

The daily average number of accidents in 1920 was forty-eight. In the first half of April, 1921, the daily average was thirty-seven. In March, 1920, there were 1,400 accidents, but in March, 1921, there were only 1,250. This reduction was made with more than 100 cars added in the year. By way of comparison the records of the Automobile Club of Southern California show 1,108 auto accidents in March, 1920, and 1,925 in March, 1921.

The monthly accident records from Dec. 1, 1920, to April 1, 1921, are as follows: December, 1,648; January, 1,480; February, 1,150; March, 1,250. The gain of March over February is partly due to the difference in number of days and also to a general choice of runs by trainmen that month.

Particular interest is taken by the claim department in the reduction of the percentage of accidents for which crews were entirely or partly responsible. On March 20, 1920, trainmen were responsible for thirteen out of the day's fifty-one accidents, as compared with no responsibility for the forty-seven accidents on March 21, 1921.

The cash value of safety is clearly indicated by the fact that damage to cars in collision with other cars and autos was $3,712 less in February, 1921, than in February, 1920.

The trainmen indicate that they have the spirit of safety first to a greater degree than ever before, all of which is shown in the inter-division safety contests which are held to determine the right to display the "Premier Safety Division" flag from their flagpole. The trainmen are now engaged in a ten weeks' safety contest. A "Safety" pennant is to be awarded for permanent possession to the winner of each contest. The scores are compiled like baseball percentages and are based on past records of the risk of the various routes.

An exhaustive investigation carried on by the Society for Electrical Development to ascertain the facts concerning fires which occurred in the year 1919 in communities supplied with electric service showed that out of a total of 138,553 fires in 345 cities, 3,568 were apparently of electrical origin. These figures establish a percentage for electrical fires of only 2.57.

Retrospect and Prospect*

Railway Pioneer, After Recounting in His Franklin Institute Address the Steps Already Taken in Applying Electric Power to Railways, Expresses the Conviction that There Are Large Opportunities Ahead for Further Developments in This Field

By FRANK T. SPRAGUE
New York City

A RECENT announcement states that in the United States alone electric railways cover a trackage of 44,000 miles and represent a capital investment of approximately $5,000,000,000, while 300,000 men are employed and over 14,000,000,000 passengers are carried annually, ten times as many as are carried by the steam railroads of the country. In addition there is the like class of roads in foreign countries and thousands of miles of trunk lines here and abroad which are electrically operated or for which electrical equipment is planned.

This is a brief epitome of one of the most astonishing of industrial growths, the product of but a third of the century near the beginning of which Faraday, "late bookkeeper's apprentice, now turned philosopher," revealed his discovery that it was possible to produce mechanical motion through magnetic action, an announcement which was followed ten years later by Henry's announcement of his invention of a crude motor.

But Henry knew that as long as the source of energy was a zinc-burning battery, coal could not be replaced. It fell to Thomas Davenport, a blacksmith of Brandon, Vt., to throw himself heart and soul into the attempt to create an industrial revolution, efforts necessarily failing if for no other reason than lack of a suitable source of power. But to him, in all justice, must be given the credit of first proposing, in a small model, the idea of an electric railway and of being granted the first broad patent as early as 1837.

Two years later there appeared in an Edinburgh publication on "Railways" the confident prophecy: "We have no hesitation in saying that electromagnetism will at no distant date compete with steam as a motive power, and successfully."

But it was eight years later before that splendid old scientist Prof. Moses G. Farmer operated at Dover, N. H., a small car carrying two passengers, to be followed four years later by Professor Page's trip with primary batteries on a road near Washington.

All the experiments of this period were, of course, doomed to commercial failure, not alone because of the crudity of the motors but because the source of power was a primary battery. They were, however, indicative of what would come later when the evolution of the modern dynamo had taken place.

Another ten years passed, when Pacinotti's invention of the continuous-current dynamo marked the birth of the modern electric machine, followed, in 1866-67, by the almost simultaneous announcement from English, German and American sources of the remarkable property of self-excitation by energy built up from the latent magnetism in the iron of the field magnets.

At the end of the decade, in 1870, the Frenchman Gramme brought out his improvement on the Italian's valuable invention and produced the first commercial machine for continuous-current operation, this machine being later superseded by the Hefner-Alteneck drum or surface-wound armature, invented also by Rowland.

Then came a discovery declared by Maxwell to be the most important of modern times, the reversibility of function, that which made it possible for the same machine to be used either as a dynamo for converting mechanical energy into electricity or as a motor to convert electricity into power, with the necessary corollary, the electric transmission of energy by coupling two such machines together in the same circuit.

It is said that Pacinotti discovered this also, but this is not an established fact, while it is certain that Gramme demonstrated it at the Vienna Exhibition in 1872 after its possibility was disclosed by a workman's mistake in coupling up a machine to the circuit. Here were at hand all the essentials of a successful beginning of electric railway experiments, but years went by until a quarter of a century had elapsed since Farmer's and Page's experiments.

Then came the crude suggestions of Greene, a poor mechanic of Michigan, who was afterward allowed a very broad patent, and the early plans of Field, who conceived in San Francisco the idea of replacing the cable by electric power. At the Berlin Exhibition in 1879 Siemens made the first public demonstration of a motor pulling a passenger car and operated with a third-rail supply and track return from a continuous-current dynamo-electric generator. This was followed by other exhibitions and then by the equipment of a one-car line at Lichterfelde, opened for traffic in May, 1881. This was the first line put into service.

In 1880, and again in 1882, Mr. Edison experimented with short electric railway lines at his laboratory in Menlo Park, later joining hands with Field in a company which never got beyond the experimental stage and did no commercial work whatever. A patent interference between Siemens, Field and Edison resulted in Siemens being ruled out because his foreign work was not admissible, and a patent was granted to Field, but in terms which proved unsupportable.

SPRAGUE LEAVES THE NAVY TO ENTER ELECTRICAL WORK

In this latter year the writer, then a naval officer on duty in London as a member of a jury at the Crystal Palace Exhibition, proposed a complete system for the Underground Railways, this being followed by a plan for operation with an under-contact overhead trolley following the lines of all tracks and switches, and with rail return. But after resigning from the naval service he devoted himself at first to problems in electric lighting as Mr. Edison's assistant and then to the development of industrial motors through his own company until 1885, when he announced plans for equipping and operating the New York Elevated.

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*Abstract of address at meeting of Franklin Institute, Philadelphia, Pa., on occasion of award of Franklin medal to Mr. Sprague.

During this period there was a renaissance of activity in electric railway development, Van Depoele, Daft and others installing a number of small installations. That by Daft on the Hampton branch of the Baltimore Union Passenger Railway in 1885 was the first railroad regularly operated by electricity in this country. Daft's other most ambitious work consisted of experiments carried on on the Ninth Avenue Elevated Railroad in New York in 1885 and 1888 with two electric locomotives named the "Ben Franklin."

In 1885 the writer, before the Society of Arts in Boston, outlined for the Elevated a new project, to comprise motors carried on the trucks, geared directly to the axles, and with provision for regenerative action and electric braking, following this announcement with important experiments for several months at the Durant Sugar Refinery and on the Thirty-fourth Street Branch of the Elevated, in 1886, where he demonstrated his wheelbarrow method of motor suspension, dual control, regenerative braking and the interpole winding on two motors carried on a truck underneath the car body.

These tests were followed by several with storage-battery cars in various cities, but this method of operation, while promising, has never been able generally to compete with the system of direct supply.

At the beginning of 1887 there were in the entire world nineteen installations, nearly equally divided between Europe and the United States. These aggregated about 60 miles of track and less than a hundred motors and motor cars, and they exhibited the widest variations in equipment and operating characteristics, none of them serving as an acceptable type for adoption. In short, the art was in a chaotic state, and something was necessary to demonstrate that the infant had a manhood ahead of it.

RICHMOND ROAD NEARLY DOUBLED WORLD'S ELECTRIC ROLLING STOCK

Fortunately that opportunity came to me, and the modern trolley with its sequence, electric traction in general, may be fairly said to date from the installation of the Richmond road, the contract for which was taken in May, 1887. We had little to show save a blueprint and a few crude machines, but faith was strong and the contract was taken under terms, price and guarantees easily placing it in the "knave or fool class," the designation applied by a scientist to Daft's project two years before in Baltimore.

The contract called for the completion in ninety days of the equipment of a road having about 12 miles of track, at that time unlaid and with the route only provisionally determined; the construction of a complete steam and electric control-station plant of 375-hp. capacity, and the furnishing of forty cars with eighty motors and all the appurtenances necessary for their operation. This was nearly as many motors as were in use on all cars throughout the rest of the world. Thirty cars were to be operated at one time, and grades as steep as 8 per cent were to be mounted. Finally, the payment was to be $110,000 "if satisfactory."

Fortunately for the future of electric railways the difficulties ahead could not be foreseen, otherwise the contract might never have been closed. But disheartening as these were, great as was the expense incurred and grave as were the risks encountered, they were justified by the results, for the Richmond road, by common consent, stands as the prototype in almost every essential detail of the modern electric trolley system, and its installation marked the real beginning of the great industry of electric traction.

The history of the Richmond road has been too often written to make it necessary now to dwell upon it at any length. Suffice it to say that after experimental runs in the latter part of 1887 it was put into commercial operation in the beginning of February, 1888, and for a year there followed an experimental period of development which taxed the resources of the company to the limit.

Pope, in a historical sketch read before the Electric Club in 1891, was appreciative enough to say: "Laboring under enormous difficulties and drawbacks, Sprague succeeded by the completion and operation of this (Richmond) plant in establishing beyond peradventure the future supremacy of the electric street railway, and many of the characteristic features at that time designed and introduced by him have practically become standards in the modern system and are found in nearly every one of the thousands of cars now in service."

Among the characteristics were the main and working conductors and feeders, the bonded rails and earth return, the universal-movement reversible trolley in the center of a car, double-end control, axle-suspended motor, series-parallel grouping, variation of field resistance, fixed end-contact brushes and lightning arresters.

The road soon commanded the attention of Henry Whitney of Boston, who soon afterward abandoned his cable projects and adopted electricity.

Richmond's early troubles were buried under a loss of $75,000, fully compensated in the subsequent growth of a great industry.

The use of the tracks by the trolley system accentuated the already serious trouble of the telephone companies, who were also using grounded circuits, and then followed a country-wide legal fight as to earth rights claimed by the telephone companies. The result was a foregone conclusion and eventually they adopted metallic circuits, for which compulsion they can thank the trolley.

HORSE RAILWAY ELECTRIFICATION ENTERS ACCELERATION PERIOD

The ensuing two years was a period of extraordinary activities, the Sprague company and the Thomson-Houston company, which had succeeded the Van Depoele company and which followed generally the Sprague practice, contracting for over two hundred roads. In Italy, at Florence, and in Germany, at Halle, the first modern roads also were installed on the Sprague system.

As typical of municipal efforts the slogan of a mass meeting called in New Orleans is illustrative. It was: Lincoln Set the Negroes Free! Sprague Has Set the Mules Free! The Long-Eared Mule No More Shall Adorn Our Streets.

Then came the consolidation of the Sprague with the Edison General Electric Company, and a gradual improvement in, and increase in size of apparatus. Form-wound armatures, proposed by Eickemeyer, replaced irregular windings and metallic brushes gave way to carbon, this single change, initiated by Van Depoele in 1888 and 1889, going a long way toward making the art a success. Cast and wrought iron yielded to steel, two-pole motors to four, double-reduction gears to single, and open motors to closed ones protected only by their own castings. In 1892 the combined series-parallel and resistance control was adopted, when the Thomson magnetic blowout was successfully applied to controllers by Mr. Potter and proved a most effective agent in reducing the troubles of operations.

Limited for a time in extent of operation by the standard of voltage adopted, the invention of polyphase alternating-current transmission, the transformer and the rotary by Ferraris, Tesla, Stanley, Bradley and others, widened out the field by making possible the economies of high-tension transmission, with the advantages of direct-current distribution and motors.

Meanwhile, a few locomotives were built, but to follow steam precedents seemed a pitiful falling short of the possibilities of electric equipment and operation and having developed a system of electric elevators with secondary switch control it suddenly flashed upon me that I could apply a like principle to railway operation; that is, make up trains at any length by the combination of car units, wholly or partly equipped with motors and with train lines, without regard to number, end relation or sequence, and to control such trains from either end of any car by a master switch connected to the common train line.

This idea, sketched quite fully on a scrap of paper, marked the complete birth of this new method, then named and now everywhere known as the "multiple-unit system." Its great possibilities instantly absorbed my interest, for I saw the opening of a new epoch in electric railway operation. Here was a way to give a train of any length all the characteristics of a single car, with every facility of operation demanded by the most exacting conditions of service and capacity, and with like control of any number of locomotives.

EPOCH-MAKING MULTIPLE-UNIT INSTALLATION ON CHICAGO ELEVATED

After two years' abortive attempts to get the privilege to demonstrate at my own expense the advantages of the system in New York, the opportunity suddenly arose in Chicago, where I was called in consultation on the South Side Elevated Railroad. Here, just ten years after the contract for the Richmond road, I took one for operating an extensive elevated equipment under conditions even more onerous and with, perhaps, less to show in a tangible way.

As I was called to London in connection with an extensive elevator contract for the new Underground Railroad then under construction, plans for operative tests were restricted in time and development, but on July 16, 1897, after but a few weeks' preparation, two cars were put into operation on the tracks of the General Electric Company, at Schenectady, and on the 26th, the half century anniversary of Professor Farmer's test of a model electric railway at Dover, my ten-year-old son operated a six-car train in the presence of the officers and engineers of the road.

There were, of course, troubles a-plenty, but by the following spring the entire equipment of 120 cars was in regular operation and every steam locomotive was out of service.

The multiple-unit system is now, the world over, an essential fundamental for all electric train operation where two or more equipped cars or locomotives are controlled from a common source, and its value in dense rapid-transit service like that in the subways in New York is indicated by the enormous increase of capacity compared with any other method of operation, a practical result which could not be equaled in any other way on the New York subways alone for less than $100,000,000 increased capital cost of construction.

HEAVY ELECTRIC TRACTION NEXT IN ORDER

Following a serious accident in the yard tunnel of the New York Central Railroad, the first step in America in main line electrification was taken when electricity was adopted for operation at, and for some distance from, the city terminal. And here again there was a radical departure in engineering practice, proposed by Mr. Batchelder.

Up to that time all motors used for railway purposes maintained a fixed relation between the armature and the field, but the locomotives adopted here were bipolar, the fields being supported by the locomotive frames, while the armatures were on the axles and free to move vertically with reference to the flattened field poles. Brackets and gears were thus dispensed with and the machine reduced to the simplest elements.

The assumed limitations of direct-current motors, with which I was in entire disagreement, and the development in alternating-current apparatus, led many engineers to predict the complete supremacy of the latter, in accordance with which belief single and polyphase and combined-phase roads were installed in America and Europe, the most notable here being the Great Northern polyphase and the New Haven single-phase, and in Europe certain Swiss and Italian roads. The controversies which arose were unduly bitter and were based very largely on the assumption that all the apparent merits claimed for single-phase operation should be accepted, even without trial, as a basis, while the possible advances in the rival direct-current system were ridiculed.

The coming of the interpole motor, a modification of the old Sprague Elevated Railway experimental type, put a new aspect on the controversy. Direct-current potentials were promptly increased, first to 1,200 volts, then to 2,400 volts and higher. The largest trunk-line installation thus far undertaken, that of the Chicago, Milwaukee & St. Paul Railroad over the Great Divide and the Cascade Mountains, is operated at 3,000 volts, while experimental operation has reached 5,000 volts.

In England the direct current has been officially adopted for future railway equipment, on the report of a special commission, and a like influential French commission has indorsed the same system after an extended investigation of the work done in the United States.

Despite the enormous advances made and the results accomplished in electric railway development, it would be folly for the electrical engineer or the railroad man to assume that the limit of invention or improvements has been reached. The urban and interurban fields, with the constant linking up of smaller into larger systems, go on expanding, but the trunk lines are still largely steam operated, although there are many thousand of miles here and abroad, on great systems, for which electric operation has been decided in the future. There is still a wide difference of opinion among engineers as to whether a single system will be dominant, and if so, which one, or whether the varying conditions and operating demands will be best met by specific solutions.

The financial question involved in the large cost of equipment cannot but remain a factor which will often prove controlling, for electrical operation will generally be adopted only where there is a commensurate gain of some kind. Where coal at low unit cost is available the gain in economy alone will not warrant the adoption of electricity on independently operated roads, but where the coal is high in price, or may be unavailable, while water power can be had at a reasonable cost, there is a valid reason for change.

Excluding special cases, what will ultimately be constructively influential is the need of increase in existing or available track capacity, which is undoubtedly possible to a system which permits of individual and simultaneous control of a concentrated or distributed power plant greater than can be got by any other means and can eliminate from its tracks the transportation of its fuel. It seems certain, however, that there must be co-operation in the important matter of power supply, and the whole trunk-line problem will appear less formidable with the elimination of the requirements of installations of individual power houses, with their necessary reserves, and the use of current from great industrial power houses properly linked together, which, in addition to their reliability, can make full use of the diversity factor in a multitude of demands.

Chicago's Transportation Problems

Aspects of Steam Railroads and Rapid Transit Service Considered by Various Speakers at the Spring Meeting of the American Society of Mechanical Engineers Held at Chicago

SIX papers on this topic were presented at the spring meeting in Chicago of the American Society of Mechanical Engineers, May 23 to 26. In the first paper J. R. Bibbins, Chicago, gave reasons for the growth of the freight traffic in Chicago. These are that the city is the principal east-west divisional transfer point between east and west railroads; it is the northern railhead of the Mississippi Valley roads and is the water gate for the interior via the Great Lakes route. The individual railroads have chosen individual terminal development to a large extent, but all the principal local freight terminals are within the one-mile zone downtown.

In a second paper E. J. Noonan discussed the possibility of a more intensive use of railway property through the development of air rights and suggested among other things two-level type freight stations with double-deck streets.

A third paper by Hugh E. Young spoke highly of the container system and declared that the motor truck can never take the place of the rail carrier for long hauls and cannot handle carload freight business in an efficient manner.

A fourth paper by Messrs. Bibbins and Noonan gave particulars of the existing Chicago electric freight tunnel, which is at present handling approximately 1,800 tons of l.c.l. freight, although its capacity is possibly five times that amount. The tunnel now has about 65 miles of line and $15,000,000 investment. A study of the reasons for this comparatively small use shows that some of the reasons are avoidable and some not. A study of the existing union tunnel freight stations shows the following results on design:

1. Platform stations required 25 sq.ft. per ton per ten-hour day.
2. Service track required one standing car per 10 tons handled per day.
3. Average load per car 1.4 tons general merchandise.
4. Team platform length 0.42 lin.ft. per ton per day.
5. Elevator capacity thirty round trips per hour now, thirty-six maximum when speeded up.
6. One thousand-ton station requires 25,000 sq.ft. of floor space, 420 lin.ft. of platform frontage, 1,260 ft. of standing track, two elevators, ninety merchandise cars.

The conclusion of this paper is that from the standpoint of the city of Chicago no transportation agency could be more effective in solving the problem of existing track capacity, and no effort should be spared to make this institution one of permanent success.

The fifth paper, by Mr. Bibbins, describes the points to be considered in a terminal survey. The sixth and last paper is by Bion J. Arnold and it is entitled "The Relation of Steam Roads to Rapid Transit Development." An abstract follows:

The Relation of Steam Roads to Rapid-Transit Development

By Bion J. Arnold
Chicago, Ill.

THE time has come for steam railroads entering large cities, especially those who are fortunate enough to own entrance rights-of-way strategically situated for long-haul suburban traffic, to enter the rapid-transit field and enter it properly.

The case of Chicago may be analyzed briefly for illustrative purposes. While Chicago is territorially a big city, 200 square miles in area, with commuter suburbs extending 15 to 20 miles in all directions, its business center is highly concentrated within a so-called "loop" (eight times ten blocks), wherein is conducted the major portion of the wholesale, department store, high-class shopping, theater, restaurant, club, business and centralized social activities of the city. Twenty-six railroad carriers enter this central district over twelve major trunk lines with a traffic of 1,340 trains and 195,000 passengers per day. All this business is concentrated in five passenger stations, which are clustered around the boundaries of the Loop and as close in as the price and competitive condition of property permitted at the time when the stations were originally located.

None of these, with the exception of the Illinois Central development, is especially adapted for the economical and quick handling of commuter or rapid-transit business. On the other hand, they are distinctly ill adapted for handling the large growth in future traffic which will undoubtedly come. There is no intercommunication between them and consequently they must necessarily remain as traffic "dumps," rather than as traffic distributers.

The Illinois Central lake-front system alone approaches the ideal of a rapid-transit distributing system, with stations distributed along the boundaries of the business district instead of concentrated at one point.

The statement is frequently made by railroad executives, and without refutation, that the commuter rapid-transit business does not pay or is carried at a large loss which must be made up by the long-distance overland passenger and freight business. If this is true, the railroad managements of the country, which are confronted with the problem of adequate revenue, stand in the inconsistent position of harboring a passenger-terminal system and conducting a public service at the expense of the stockholders or the other patrons of the system. Either aspect, if true, represents an unstable economic condition which cannot last. And if the commuter traffic is not in fact supporting the full cost of producing this service, there is no better time than the present for the railroads to establish the facts in the case and endeavor to have this traffic handled in a more practicable manner.

TRUNK LINES SHOULD CO-OPERATE IN TRANSIT PLANS

However, there are some who believe that railroad accounting has not yet been sufficiently perfected to reveal fully the equitable allotment of terminal and service charges as between long-distance and local rapid-transit service on the steam railroads. Those who defend the use of the monumental terminals claim that they would be required in any event for cross-country travel and that the rapid-transit service can therefore be accommodated at very little cost off hours, as a by-product. But this is hardly the case in a large community such as Chicago, for the rapid-transit peak practically coincides with the main-line peak, especially in the morning when overnight travel reaches the city. Still it is claimed that this commuter travel should not bear the same operating costs and fixed terminal charges per passenger as the overland traffic because the suburbanites use relatively few of the main-station facilities. Whether this is true or not, it is believed by many engineers in railroad service and in civil life that some careful and thorough research into the economics of railroad suburban-passenger business should be instituted at once, with the specific object of finding out whether the railroads could better handle it or should turn it over to some other agency better organized for the purpose.

The hopeful plan in mind seems to be that the steam railroads which are so strategically located with respect to long-haul, suburban commuter traffic should undertake an immediate reorganization of this great arm of local transportation and co-ordinate its services with the other surveys of the city in such a way that unified operation of the entire local transportation business may be carried on with the least total expense and maximum usefulness.

The Law of Electrolysis

Analysis of Fifty-three Higher Court Decisions Bearing on the Subject Condensed in a Compact Form Which Will Make It of Interest to Railway Men

IN A RECENTLY published pamphlet Samuel S. Wyer, consulting engineer, Columbus, Ohio, discusses at length some of the legal phases of the electrolysis problem under the title "Analogy of Responsibility for Damages from Leaking or Stray Electric Currents from Electric Railroads to Adjudicated Responsibility for Damages from Leaking Water, Oil or Gas, Noxious Gases or Sparks."

In the introduction the author defines the term "stray current" and explains why stray currents are likely to be destructive agents. He also lists the various classes of underground property most likely to be affected by stray currents. In another part of the report, which is also devoted to the technical side of the question, the more important damages or causes of damage are given as: Fire hazard due to arcing between pipes in a building; gas explosions caused by stray currents igniting gas in basements, manholes, etc.; damage to water pipes, telephone and power cables and metal work in underground structures.

It is assumed in the discussion that the following engineering facts have been established:

1. There will always be some current leakage where a grounded return circuit is used and this leakage can be measured.
2. Stray currents injure underground metallic structures where they leave such structures to go into the soil.
3. Proper mitigating methods will so reduce the leakage as to render it not dangerous.
4. The double-trolley system would eliminate all stray currents and stray current troubles.
5. The cost of elimination or mitigation is not prohibitive considering the hazard which is to be guarded against.

COURT RULINGS ON ELECTROLYSIS

In the discussion of the legal phases it is pointed out that there have been only three important electrolysis court decisions: Manufacturers' Natural Gas Company vs. Indianapolis Street Railway, Dayton vs. City Railway, and Peoria Water Works vs. Peoria Railway. The bulk of the discussion is devoted to an analysis of the pertinent portions of fifty-three important higher court decisions bearing on responsibility for damage from leaking water, gas, oil or noxious gases and sparks. Of these decisions there are one by the United States Supreme Court, one by the British House of Lords, one by the British Privy Council and thirty-one by the supreme courts of various states. The several decisions are arranged chronologically, beginning with a decision of the New York Supreme Court in 1856. In each case the quotation from a decision is followed by what is termed a "stray current analogy"; that is, a statement of what would have been said had the same line of reasoning been applied to stray electric currents. The final conclusion reached is that the old legal maxim "Every man has a right to use his own property as to himself seems proper, but he must be careful so to use it that no injury is done to another" should and can be applied to responsibility for damage from electrolysis or other stray current injury.

The pamphlet is of interest to railway men chiefly because it condenses in a compact form a large number of legal decisions bearing on the stray current problem. It may be pointed out that the same decisions also have some bearing on the legal phases of the inductive interference problem, which of late has been so important in connection with the increasing density of electric power and communication service. The decisions quoted all bear on the fundamental law of the land as it pertains to the rights and duties of the fee simple owners of real property.

There is no analysis of those problems pertaining to the rights of the public in connection with public utility properties nor of those where both parties involved are using public property by virtue of an easement right.

Constantinople Tramways

STREET railway service in Constantinople was stopped in December, 1918, and was gradually resumed beginning March 5, 1919, reaching normal in June. The fares are five times as great as before the war.

Some rolling-stock ordered in Europe has been received and many cars are being rehabilitated. According to the *Revue Générale de l'Electricité*, from which these notes are taken, the exchange rate has been a severe handicap to the railway system.

Trackless Trolleys for New York

Department of Plant and Structures Specifies Details of Trolley Bus to Be Operated on Staten Island in Connection with Municipal Trolley Line

THE city of New York, through its board of purchases, has asked for bids for seven electric motor-driven trackless trolley cars. These are to be put in operation by the department of plant and structures in connection with the municipal trolleys now in operation on Staten Island. The routes for operation will be from Meier's Corner to Linoleumville, and from Manor Road and Schmidt's Lane to Sea View Hospital. The bids were advertised on May 7 and were scheduled to be opened on May 23.

The cars are to be of the semi-open type and equipped for one-man operation. All structural steel shapes, rivet steel, castings, etc., are to be in accordance with the A. S. T. M. specifications. The contractor is required to deposit $1,000 to cover the cost of inspection during construction.

The completed car must be able to travel with a load of 10,000 lb. over New York City thoroughfares without showing evidence of weakness and excessive heating in any part. Tests must also be made by the contractor to conform to all rules and regulations of the New York Public Service Commission and other city and state departments having jurisdiction. Broken parts due to defective design, materials or workmanship are to be replaced without expense to the city for one year.

Some of the requirements of the chassis frame are that it is to be of 6-in. channel section, weighing not less than 13 lb. per foot, properly reinforced with hot-riveted gussets at all corners and intersections of cross members. The front axle is to be of I-beam section, of 3.5 tons capacity, equipped with ball-bearing steering head and roller-bearing spindles. The rear axle is to be of 2.5 tons capacity, fitted with worm drive and full ball bearings, and with internal brakes of 18-in. diameter. Spindles are to be 2.75 in. diameter. The front springs are to be 50 in. long and 3 in. wide with eleven leaves, while the rear springs are to be 56 in. long, 3 in. wide, with fifteen leaves.

A steel body is specified, constructed with steel uprights and rolled steel carlines, all joints to have gussets and to be hot riveted. The body below the window sill is to be paneled with ¼-in. "Steelosote" and so arranged as to be easily replaced in case of damage. The roof covering is to be "Steelosote," in sections shaped to conform to the contour of the roof structure. The floor is to be tongued-and-grooved maple and covered with rubber inlaid tile flooring.

The main entrance and exit door is to be located on the right-hand side, of the two section folding type and operated by a hand lever. An emergency door, fitted with a collapsible folding step, is required at the rear. Plate-glass windows of the best D.T.A. car glass, mounted in brass window sash with detachable rubber weather strips, were specified, as were also Pantasote window shades with rollers and car fixtures.

The carrying capacity of the car is to be thirty seated passengers, with standing room for ten additional. The aisle-way is to be 24 in. Cross seats, 30 in. wide, with steel seat frames fitted with Marshall spring cushions and backs trimmed with No. 1 machine-buffed genuine leather are to be used. In the roof is to be an exhaust ventilating system, and a buzzer signal system is included for convenience of passengers.

Each car is to carry one 25-hp., 600-volt, direct-current motor of the box-frame commutating-pole, self-ventilating, ball-bearing type. The forward end of the armature shaft is to be tapered to fit a standard universal coupling on the drive shaft. The opposite end of the armature shaft is to be equipped with a direct-current generator to charge an 80-amp.-hr. storage battery for marker and emergency lighting.

The type of control specified is of the rheostatic (K) type with five points arranged for foot operation, hand operation being for use only in emergency. The reversing feature is to be the same as in any standard K-type railroad controller. The positive line is to carry a standard railroad-type circuit-breaker while the negative side of the circuit is to be fused.

The drive from the motor to the rear axle is to be through a tubular propeller shaft fitted with universal joints at both ends. The steering gear is of 3.5 tons capacity, compounded at a ratio of 2.5:1 and fitted with a 22-in. handwheel. Or, instead of the axles, drives and motors specified above, truss axles, internal gear drives and multiple motors may be used. The capacity of axles and drives and the aggregate power of the motors, however, shall not be less than already specified. Internal gears shall have not less than two gears bearing on the driving gear.

DETAILS OF EQUIPMENT

Regular foot and emergency hand brakes, following automobile design, and a 12-in. foot gong are to be furnished.

Front and rear wheels are to be of the American cushion type, with solid rubber tires. They are to be 36 in. in diameter, with a 6-in. tread, and made of second-growth hickory.

The electric heaters specified must provide an even distribution of heat throughout the car with a maximum power consumption of approximately 6 kw. and have an arrangement for three temperature graduations of 2 kw. each. Heater wiring is to be in conduit under the car body and in molding inside.

The main lighting circuit is to carry ten round, 110-volt, 23-watt-type lamps mounted in flush-type receptacles, and the emergency lighting circuit, operated from the storage battery, is to consist of four 6-volt 15-cp. lamps in special dome fixtures. There are to be two 6-volt, 21-cp. headlights and two front and one rear 6-volt, 4-cp. marker lights. All headlights and markers are to operate from the storage battery.

The trolley-pole collector, or pole head, is to be of the sliding type for use with a wire spacing of 14 in. It is the intention that operation shall usually be in but one direction, but provision is made in the design for operation in the reverse direction for short distances at low speed. Another requirement of design is that if the pole head leaves the wire it will not cause a short circuit due to metal parts spanning the two wires. The shoes or contact parts must be renewable, have a liberal contact surface and be fitted with grooves for retaining a lubricant.

Requirements also call for an adapter fastened to the pole head and a trailing rail contact shoe so as to make it possible to operate the car at slow speed on a 600-volt grounded return circuit.

The trolley pole must be sufficiently rigid to force the pole head or contactor against the trolley wires at a normal working upward pressure of 36 lb. Provision must also be made against short circuit if the pole crosses both trolley wires, and two No. 4 extra flexible insulated cables suitable for carrying 600-volt power are to be used for conductors.

The trolley base is to be of the hand maneuvered type, provided with slip rings so that the pole can be rotated. All bearings are to be of the roller type. The top thrust bearing is to be so constructed that the lubricant cannot leak out on the car roof or down the maneuvering mechanism. Another provision is that the pole head must keep in contact with the trolley wires should the car turn out for another to pass. A buffer spring is required to absorb upward blows in case the pole leaves the wire, with a latch to lock the pole socket in a horizontal position during removing or installation of trolley poles. The maneuvering mechanism is to be of such construction that the operator can rotate, raise or lower the pole without leaving his seat.

Supports are to be provided for a fare box which can be placed at various angles and so held stationary. Finally, the regulations for painting call for the most thorough and careful method known for passenger cars with the special object in view of providing a rust-inhibitive coating. The exterior finish is to be full oil gloss and white enamel for the interior. The paints used must follow New York City specifications.

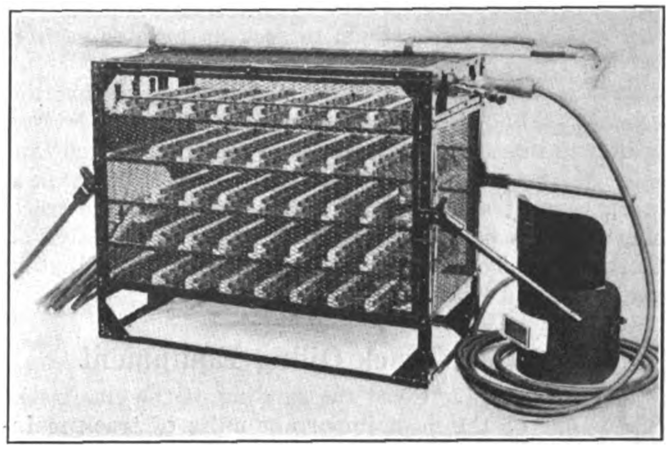
New Resistance-Type Arc Welder

A NEW electric arc welder, called the "Ajax," is being placed on the market by the Railway Track-Work Company, Philadelphia, Pa. It consists of special wire resistance coils supported on insulator bars which are mounted on a frame of steel angles. A switchboard for controlling the current is mounted at one end of the frame.

The type of machine which is recommended for railway work weighs approximately 100 lb., and is 18 in. x 36 in. x 36 in. in size.

The designers of this machine have given special consideration to high current capacity, accessibility of parts, ventilation and portability. The wire used in the resistance coils is a special grade of very high resistivity adopted after several years of tests and experiments.

A control mechanism, consisting of a line switch by means of which current can be cut off from all the coils, is mounted on one end of the framework. At the opposite end the switchboard for regulating the current is mounted. A shunt switching device provides for short-circuiting a portion of the coils where large currents are required. By this arrangement control over several groups of coils is made independently of the other groups. The switchboard provides for thirty-six values of current.


NEW RESISTANCE-TYPE ARC WELDER

Several plugs are provided for attaching the lead wires to the machine. These plugs have wooden handles to protect the operator from shocks and also to prevent short circuits.

Just After Lunch at the Wethersfield Carhouse

This Large Group Indicates the Success of the Joint Meeting of the Two Organizations Which Resulted Largely from the Efforts of I. A. May, Past-President of the New England Street Railway Club. See Last Week's Issue for Details.

NEW ENGLAND STREET RAILWAY CLUB
CONNECTICUT COMPANY SECTION A.E.R.A.
HARTFORD CONN. MAY 18 1921

Closed Buckets for Track Oilers

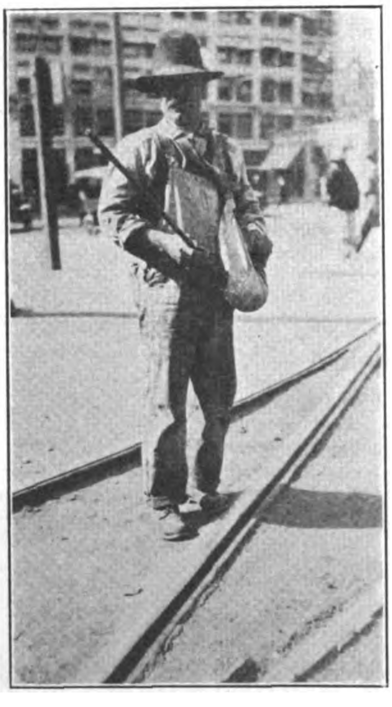
COVERED TRACK-OILING BUCKET

IT USED to be the case on the Pacific Electric Railway that frequent complaints arose about track oilers traveling around on city cars with oil buckets. Oil running down the sides of the buckets offered an opportunity to mar or ruin the clothes of passengers, even though the oilers' instructions required them to seek an isolated section of the car.

To remedy this condition the engineering department devised a closed type, galvanized-iron oil-carrying bucket. It is neat in appearance and when properly handled by the track oiler there is no chance of spilling oil over the side of the bucket. There is an opening in the lid so that it may be closed without removing the brush.

Practical Track Oiling Equipment

ON THE Pacific Coast the sanding of the city tracks is one of the most important units of track maintenance because of frequent heavy fogs and light misty rains. The engineering department of the Pacific Electric Railway has employees who are held responsible for the sanding of the tracks.



SANDING BAG USED ON CITY TRACKS OF PACIFIC ELECTRIC

For efficiently handling this element of maintenance work, particularly when the sanders are given an emergency call during foggy weather, they are equipped with an open-top sanding bag constructed of heavy canvas cloth and provided with straps which go over the shoulders. Attached to the bottom of the bag is a piece of rubber hose 6 in. in length with a ¾-in. opening. An iron tube 3 ft. in length, with a ¾-in. opening, is carried by the sander, who inserts the tube in the rubber hose section when he wishes to begin operation.

When the conveyor tube is not in use, the flow of sand is shut off by merely raising the piece of rubber hose. Likewise, when the sander desires to cease sanding, he merely elevates the iron conveyor tube without detaching it. The benefit of this practical sand bag is its simple arrangement, which makes its operation efficient and economical and which permits work to be handled with dispatch, especially in congested localities.

Association News

Important Meeting of Way Matters Committee

THE committee on way matters held an enthusiastic two-day meeting at association headquarters on May 18 and 19. The meeting indicated that the report of the committee will contain much information on live subjects dealing with track and roadway maintenance.

Among the members present were R. C. Cram, chairman; C. A. Alden, V. Angerer, W. R. Dunham, Jr., E. B. Entwisle, H. H. George and E. M. T. Ryder. Others in attendance on invitation were W. P. Day and F. H. Ogden, International Steel Tie Company, Cleveland, Ohio; H. L. Whittemore, United States Bureau of Standards, Washington, D. C.; G. C. Farkell, National Tube Company, Lorain, Ohio; F. A. Weymouth, Bethlehem (Pa.) Steel Company; W. J. Sheehy, East Rochester, N. Y.; W. W. Wysor, United Railways & Electric Company, Baltimore, Md.; E. F. Hartman, Crotexol Corporation, and S. W. Dannett, Rail Welding and Bonding Company, New York City.

Among the subjects on which definite action was taken for inclusion in the final report were design of curved treads for girder and girder guard rails, method of determining brittleness in rails which entails a change in the specifications for girder rails, a new specification for rail-bound insert special trackwork, and a comprehensive investigation on arc-weld joints, the report on which will contain many data and illustrations.

The Bureau of Standards again expressed a willingness to co-operate in forming a special committee to undertake tests of all forms of welded joints. The way committee recommended that the special committee consist of the following representatives: One each from the Bureau of Standards, the University of Illinois, the manufacturers of welding materials and the American Bureau of Welding and two from the Engineering Association.

In connection with the study of substitute ties the International Steel Tie Company presented a treatise on its form of tie which explained all the details of construction. A model of a pressed steel substitute tie, recently patented, was also shown by the inventor, W. J. Sheehy. A progress report will be made on this subject and reassignment asked for the ensuing committee.

The sub-committee appointed to study curved contour for wheel treads, jointly with the committee on equipment, will submit a progress report. It was the sense of the way committee that the present data are not sufficient to prove or disprove the theory that the curved wheel tread would be worthy of adoption. Continuance is to be asked for the ensuing committee.

A list of approved standards was presented and will be suggested to the committee on standards for submission to the American Engineering Standards Committee.

A progress report, with tables and appropriate information, is to be included in the final report of the committee on clearance curves as a matter of information. The sub-committee on standardization of frogs and track centers in special trackwork layouts presented a report on standard turnouts and crossovers which also amends various specifications now in the Engineering Manual as to frog angles, frog-arm lengths and radii of switches and mates.

A report on wood preservatives covering a number of important specifications for creosote oils and other preservatives and methods of preservative treatment of timbers was accepted. It will be published as a separate paper and will cover the joint report of the three principal committees involved. Mention to that effect will be made in the annual report of the way committee.

Chairman Cram is to outline for the benefit of the secretary his views as to research work that can be done by the experiment station of Illinois University on welded joints and curved wheel treads.

Merchandising Transportation Committee Meets

THE T. & T. Association committee on merchandising transportation met at association headquarters on May 20 to discuss the subject in hand preparatory to completion of the report to the coming convention.

Among those present were V. L. Lloyd, Cleveland, representing J. H. Alexander, chairman; W. H. Boyce, Beaver Valley Traction Company; K. A. Simmons, proxy for M. B. Lambert, Westinghouse Electric & Manufacturing Company, and J. W. Welsh, acting secretary. Letters from several other members of the committee reporting on the subject assigned were available for discussion.

In reviewing the subject of courtesy of train crews, it was brought out first that courtesy begins at home and it is necessary to instill this fact first in the minds of the supervisory force. Meetings with this class of employees usually produce the desired result. With the trainmen themselves, however, it takes more than mere meetings at which some official talks to obtain the necessary interest. Letters to the men at their homes have produced better results than notices posted on bulletin boards. These letters, if followed up with individual instructions, soon get the men into such a frame of mind that some good merchandising can be done. Suggestion sheets for improvements in service and equipment should also be mailed to the trainmen, instead of being left where they can be had when wanted. Such a time never seems to come, but if the sheets are sent to the homes they are more likely to be used. If the men's suggestions are used the writer should be so notified.

Other means of enlisting the aid of employees outlined at the meeting were noonday talks, posters at division points and issuance of pamphlets. The spoken word, however, was considered to be by far the best method if the speaker had a message that his audience wanted to hear. An indirect means of accomplishing some good results is the company publication, which can be read at home.

Discussion also brought out that the electric railways should participate in all community activities supported by civic organizations that benefit the territory served. Advertising through the local boards of trade and chambers of commerce where community affairs are largely discussed by all interested are also indirectly of much benefit.

Letter to the Editors

Baltimore Wants Separate Entrances and Exits with One-Man Cars

UNITED RAILWAYS & ELECTRIC COMPANY

BALTIMORE, MD., May 19, 1921.

To the Editors:

While not desiring to enter into a controversy concerning the merits of the present standard Birney safety car, there is one point that seems to me has not been given due emphasis in the discussion that has taken place. This is the fact that because a car will operate in smaller places, such as Terre Haute or some medium sized city in the Southwest, it does not mean that it is the most efficient design for operation in larger cities, under the conditions of heavy traffic which exist there.

The best proof of the need for another design of a one-man car with more adequate passenger interchange facilities is actual operation. Here in Baltimore we equipped one heavy transfer line with one-man safety cars of standard design, and increased the service 50 per cent when the new cars were put on. These cars replaced a single-truck car, seating thirty people, equipped with longitudinal seats and with 5-ft. platforms. Notwithstanding the greatly improved service furnished with the safety cars, we found it necessary to lengthen the running time during the peak hours in order to keep the cars on time.

There has been some complaint on the part of the public, particularly during rush hours, because of the delays due to loading and unloading the cars, to the narrow platforms and to the congestion that inevitably occurs at the front of the car. This latter was intensified because many people were using the car for short transfer rides and would not go to the rear, because they wished to alight a short distance from where they boarded.

We feel that the one thing that made the car at all successful was the large increase in service. This "acid test" proved to our satisfaction that under such conditions of heavy traffic the present design of the one-man car is not adequate. Therefore, when we recently purchased ten additional cars, we specified a wider platform which provided separate exit and entrance passageways in order to prove out our ideas, and if these cars operate as we feel they will, future one-man cars on this property will be provided with the wider platforms.

Thus it will be seen that in order to consider the public and to give it efficient, satisfactory service the present type of standard one-man car was not adequate. Further, we of the industry should be careful not to jeopardize the great advantages of one-man car operation and risk the possibility of losing these advantages through failure to please the public, just because of the arguments being put out at present for holding to a single design, without recognizing the fact that this design is not suitable for all conditions of electric railway traffic.

L. H. PALMER,
Assistant to President.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Wages Cut in Cincinnati

Eighteen per Cent Reduction Effective July 1 Accepted by Trainmen at Referendum

An agreement was recently entered into between the Cincinnati (Ohio) Traction Company and its union employees, members of the Amalgamated Association, whereby an 18 per cent reduction in wages will go into effect on July 1. Readjustment to the new basis was accepted by the men by a vote of 832 for and 606 against.

The new contract will expire on June 30, 1922. The new and the old rates of pay in cents per hour follow:

	Present	Effective July 1, 1921
Motormen and conductors		
First three months....	54	45
Next nine months.....	57	48
Thereafter	59	50
Curve cleaners	45	32
Car tenders	45	32
Watchmen	45	30
Electric shovel operators	65	52

Barn men, uniform reduction of 20 per cent
Time and one-half for overtime, both periods

There were no important changes in working conditions, except that the men have heretofore been paid at the rate of twelve minutes' time for each accident report made out. Under the new contract they will not receive any additional time for this.

The new arrangement was made following conferences attended by W. Kesley Schoepf, president of the railway; officials of the local union and W. D. Mahon, president of the Amalgamated Association. In connection with the agreement it is significant to note that the contract was entered into voluntarily and without arbitration more than a month before the old contract expired.

Large Saving Made

It is estimated unofficially that the new scale will save the Cincinnati Traction Company a total of between $400,000 and $500,000 in wages in a year. The deficit which has accumulated under the present franchise up to May 1 is $806,427, according to figures of W. Jerome Kuertz, Street Railway Director. Under the terms of the franchise fares cannot be reduced until this deficit is wiped out and a surplus of $650,000 has been built up. The railway has a fund of $400,000 held inviolate which would be applied to accumulation of the $650,000 surplus. Therefore, before fares can be reduced the company must gain $1,056,427, or $250,000 plus the deficit of $806,427.

"It is indeed gratifying to see such a manly expression from the carmen," said W. Kesley Schoepf, president of the traction company, in commenting on the action of the union men.

Street Railway Director Kuertz said that he had been working and will continue to work for a reduction in fares. "I am conducting an investigation and have found that wages are a large factor in the proposition," said Mr. Kuertz. "But there are many other considerations. For instance there was a considerable falling off in the number of car riders in April of this year compared with April of 1920. There also has been a reduction in the cost of material such as coal."

Service-at-Cost Grant Upheld

The validity of the Findlay service-at-cost ordinance has been upheld by Common Pleas Judge William F. Duncan at Findlay. The Toledo, Bowling Green & Southern Traction Company was granted the franchise by the Findlay Council last February.

Attorney George H. Phelps attacked the franchise in the court.

Judge Duncan held that the city had relinquished none of its rights under the new grant.

The City Street Railway Commission also issued a statement to the public informing riders that unless traffic increases in the next month fares would automatically jump from 8 to 9 cents.

The stabilizing fund which was originally set at $20,000 has now a balance of $17,486. The April deficit was $1,654. The ordinance became effective on March 17.

In April, 1921, there were 2,000 riders daily as compared with 2,900 in April last year.

Ten-minute service was put into effect with the new ordinance and it is possible that the commission may cut service to twelve minutes if the traffic slump continues.

City Construction with Private Operation Suggested

John W. Shartell, owner of the railways in Oklahoma City and Tulsa, Okla., told the City Club at Tulsa that the only hope for improvement in service and needed extensions was in municipal ownership, as the company could not hope to build extensions or otherwise improve the service. It will cost $5,000,000, he said, to build the Tulsa street railway up to the needs of the traffic. He advocated an immediate bond issue of $1,000,000 for railway extensions to be built by the city, explaining that the lines so built could be leased to the traction company for operation.

Another Settlement Proposed

Banker Makes Concession Looking Toward Rehabilitation of Company at New Orleans

C. C. Chappele, representative of the junior security holders of New York, interested in the New Orleans Railway & Light Company, has been in New Orleans for several days in conference with Mayor McShane and the City Commissioners trying to work out a plan whereby the traction company may be refinanced and rehabilitated. He is accompanied by W. W. Harris, an expert on public utility matters. Mr. Chappele is for any plan that will stabilize the securities of the company and restore its credit.

Mr. Chappele has sought to stress three points which he regards as essential of achievement if the city's railway troubles are to be settled. The first of these is a fair valuation; the second, a fair return; and the third and last, reorganization on lines that will instill confidence and enlist the aid of capitalists who might be induced to advance the money necessary to rehabilitate the property.

He deprecated any settlement by the courts which might lead to delays even if it placed a higher valuation upon the property than had been fixed by the citizens' committee of forty. The valuation by this body was $44,700,000. Mr. Chappele believed that this valuation did not represent the true value of the property, but said he would be willing to accept that amount and would recommend it to his principals as the minimum.

It was his honest opinion, however, that the property was worth $50,000,000 and he felt confident that, if the matter were left to the courts for adjudication, the valuation would very likely be fixed at $60,000,000. His belief was based upon the decisions of the courts in similar cases in the recent past.

The several conferences held by Mr. Chappele with the Mayor and Commissioners disclosed the fact no proposition would be entertained which did not give promise of lower fares and reduced gas and electric light rates. Mr. Chappele promised to prepare a statement for the Commission Council which would show the effect of the drop in the cost of labor and material upon the operating expenses, since Commissioner of Finance Murphy declared he would not commit himself to the $44,700,000 valuation until shown that the fare and rates for gas and light would be affected by the fall in the price of labor and material.

It has since been disclosed that the

plan submitted to the Commission Council on May 20 by Mr. Chappele contemplates the formation of an entirely new company. The plan adheres to the valuation placed upon the property by the citizens' committee of forty which was acceptable to the Eastern bankers at an 8 per cent return. The bankers had signified their willingness to accept a 7 per cent return, but the Council at that time was unwilling to consent to either that return or the valuation.

Mr. Chappele declared in his statement to the Council that nothing less than an 8 per cent return will be feasible to work out the tangle in which the company now finds itself and is of opinion that the courts, if left to adjudicate the matter, would give a higher rate of interest than was fixed by the committee of forty.

This plan, Mr. Chappele indicated in his report to the Council, would attract the capital desired to rehabilitate the company and would make ultimately for lower fares. The Commission Council decided to postpone consideration of the matter until May 23.

The city of New Orleans has been afforded an opportunity of carrying up its case against Receiver O'Keefe, who enjoined the Commission Council from interfering with the collection of the 8-cent car fare. Judge Clayton, who issued the injunction, has granted the city an appeal from the order. The case will now go to the United States Circuit Court of Appeals.

Injunction Denied to City

Justice McAvoy in the Supreme Court has denied the application of the city of New York for an injunction restraining the new Public Service Commission from taking office. The court's decision upholds the State law under which the Governor appointed the transit board, and permits the new members to take possession of their offices, which had been denied them by the old board.

The injunction, brought by Corporation Counsel John P. O'Brien in behalf of the city, sought to prevent the Governor's appointees, headed by Commissioner George McAneny, from taking charge of public service affairs.

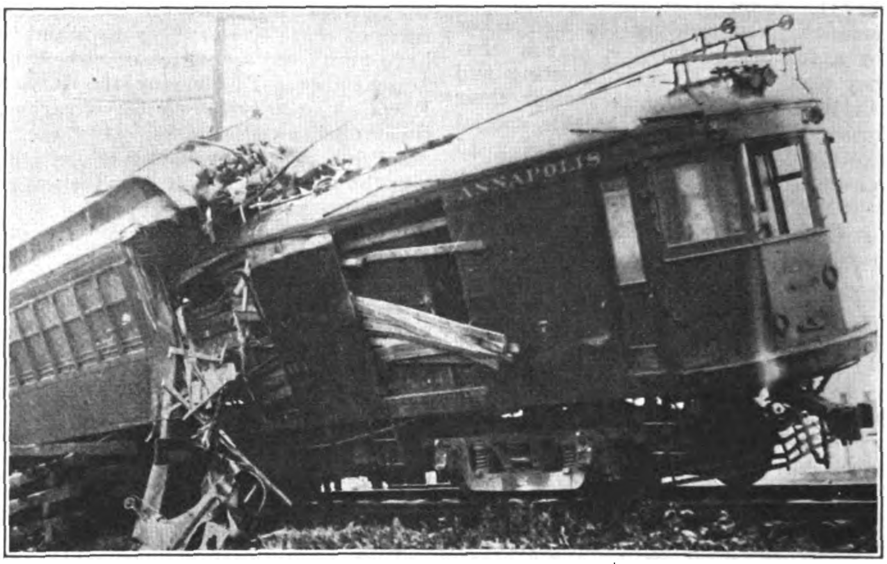
Justice McAvoy, in the course of his decision, said:

> The complaint grounds its demands for the inhibition of the injunctive process upon an allegation that the Transit Commission, these defendants, are about to and will grant under the pretended consents in the form of contracts which they will make for and in the name of the plaintiff with various street railroad companies and said contracts will purport to relieve the companies from the obligation of compliance with the provisions and conditions and obligations theretofore imposed, and that these defendants will modify and alter provisions and conditions of the contract and restore and validate rights of operation which the local authority, for instance now the Board of Estimate and Apportionment, has forfeited, and that such acts will result in irreparable financial injury to the plaintiff, its people and inhabitants unless thwarted by judicial order. . . . The imminence of danger of the execution of contracts that will violate the city's prescribed constitutional rights cannot be before the court for even an examination of the legality thereof until they are proposed to be executed.

Twenty-three Hurt on Washington Interurban

A head-on collision between a passenger train and a work extra on the Washington, Baltimore & Annapolis Electric Railroad at Ferndale, Md., on May 5, resulted in the death of one employee and the injury of ten passengers and thirteen employees. After investigation of this accident, the chief of the Bureau of Safety of the Interstate Commerce Commission reports the following conclusions:

> This accident was caused by work extra No. 7 being operated against train No. 339, an overdue superior train, without proper authority, for which Conductor Johnson and Motorman Dyson are responsible.
>
> The statement of Conductor Johnson indicates that in some manner he and Motorman Dyson reached the conclusion that inasmuch as the train leaving Baltimore at 2:20 p.m. had passed, the next southbound train they would have to meet would be the train leaving Baltimore at 3:20 p.m., both of them overlooking train No. 339, which was scheduled to leave Baltimore at 2:50 p.m. This accident could have been avoided had either of these employees consulted the time table before proceeding northward from Marley, for they would have seen that the train scheduled to leave Baltimore at 2:50 p.m. was operated daily.



TWO TRAINS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS LINE COLLIDED AT FERNDALE ON MAY 5

The line on which the accident occurred, at present extending between Short Line Junction and Annapolis, was taken over by the Washington, Baltimore & Annapolis Electric Railroad on March 16, 1921, and a contract was made six days previous thereto for the installation of an automatic block signal system between the two points. The opinion of the commission is that had such a system been in use at the time of the accident, the collision undoubtedly would have been prevented.

Conductor Johnson was employed as a brakeman in 1918, promoted to extra motorman and extra conductor in January, 1919, and to freight conductor in April, 1919. On Sept. 20, 1919, he failed to observe an order and ran by a meeting point. Motorman Dyson was transferred from the shop department to the transportation department in March, 1914, and assigned to service as an extra motorman and inspector. His record is clear.

At the time of the accident the crew of train No. 339 had been on duty a little more than ten hours, after about 11½ hours off duty. The crew of work extra No. 7 had been on duty about 8½ hours, previous to which the members had been off duty twenty-one hours or more.

$1,000,000 for Storage Yard at Boston

The Boston (Mass.) Elevated Railway is constructing an elevated train storage yard at Forest Hills, the southern terminus of the main trunk line elevated road. The present stub-end double-track line, which ends about a train length beyond the Forest Hills Terminal Station, is being extended across the junction of Washington and Walk Hill streets, onto private land purchased by the company. Here the structure will branch out into one four track section and one three track section.

Only the three track section will be built at the present time, but the leads are being installed for the four track section. On this latter, it is planned also in the future to construct a 500-ft. house, for an inspection shop and minor emergency repairs.

The immediate work on hand contemplates the completion of three storage tracks with a total capacity of eighty standard elevated cars. The estimated cost is $660,000, for the immediate work, and about $1,100,000 for the entire job, including the house. The latter will be of brick and concrete construction, on a steel framework. The ground floor below the structure will serve as a basement for the storage of supplies, and will be connected with the surface car tracks.

Capital for this improvement is coming from the money made available by the State purchase of the Cambridge subway, and the expenditure has been approved by the Massachusetts Department of Public Utilities.

Employees Approve 15 per Cent Wage Reduction

Employees of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., at a recent meeting voted on the compromise proposition of a 15 per cent wage reduction offered by the company and the vote was carried by a substantial majority. The men had previously rejected two proposed wage reductions. In accordance with its contract, the company notified the men that on May 1 the agreement was to be opened up. A proposition was then made to reduce the wages of all employees 20 per cent, all rules and working conditions to remain the same.

After the men had flatly rejected this proposition the company made a compromise proposition, offering a wage cut of 15 per cent. This was also rejected. The company then notified its employees that it was willing to put the matter up to arbitration and that the original plan of 20 per cent reduction would go into effect on May 1, subject to award by the arbitration board retroactive to May 1. Soon after this decision the committee representing the men asked for a further conference, stating that they would call a special meeting and ask the employees to reconsider their former action. It was at this special meeting that the proposition of a 15 per cent reduction carried.

Order Attacked Directing Terminal Improvement

The Pacific Electric Railway, Southern Pacific Lines and Los Angeles & Salt Lake Railroad have asked for rehearings with the Railroad Commission on its recent passenger terminal order, declaring that the tendency of the order is confiscatory, that it was apparently prepared in a hasty manner, that it intermingles and confuses their separate interests, and calls upon them to participate in a colossal improvement which, they insist, only Congress can bring about.

In case the application for a rehearing is denied by the commission the railroads state that they are prepared to ask the State Supreme Court for a writ of review. If the State Supreme Court should uphold the order of the commission, the next step will be to ask the United States Supreme Court for a writ of error. It is stated that it is not unlikely that some of the railroads will ask for a Federal injunction against the commission's order.

The Pacific Electric Railway objects to the order, its officials say, because it requires the company to participate in the construction of a union passenger terminal, and it looks with disfavor upon the commission's requirement to the effect that it pay for a separation of grade crossings at the Macey Street and Seventh Street crossings, declaring that it has no property there and that other roads should bear the expense.

The attack of the Southern Pacific upon the commission's order declares such authority lies only with the Interstate Commerce Commission. The Pacific Electric petition is based upon jurisdictional and constitutional grounds, challenging the authority of the Railroad Commission to order payment by the railway for work in which it has no interest and where it will not be required or permitted to use the new facilities.

The order of the commission directing the expenditure of $32,000,000 in terminal improvements at Los Angeles was reviewed in the ELECTRIC RAILWAY JOURNAL for May 7, page 868.

Legislative Inquiry Completed

Massachusetts Railways Absolved—Evidence to Go Before District Attorney

The special committee of both houses of the Massachusetts Legislature which has been investigating alleged irregularities in connection with the passage of street railway relief bills in 1918 and 1919 has filed its report. In all, thirty-eight members of the legislatures of those two years were found to have purchased securities of either the Massachusetts Electric or the Boston Elevated Railway companies at various times during those years. Of these, a number opposed and voted against the bills, but apparently felt sure they were certain to pass.

The two companies were entirely absolved from the insinuations that were made before and during the hearings that they had led the members of the legislature to speculate in the stocks of the companies with a view to influencing their votes, or that the companies or anyone representing them, had used any improper influence to secure favorable action on the bills. Allegations were dismissed that there was a "slush fund" raised and used for purposes of corrupting legislators.

The committee consisted of two senators and three representatives, none of whom was a member of the 1918 Legislature, although one was a member of the following year's body, it being determined to include that year's transactions in the investigation, after the committee had been appointed. Four of the committee were Republicans and one a Democrat. The report was unanimous as far as the main findings were concerned and was signed by all members of the committee, but the Democratic member filed a minority report dissenting from some of the conclusions.

The report recommended that copies of the evidence brought out in the hearings be transmitted to the District Attorney of Suffolk County, for such action on his part as he feels advisable. There was no censure offered for those members who had speculated in the railway stocks, nor was there any recommendation for the expulsion of those still serving in the Legislature, as had been expected. The committee took the ground that being a joint committee it had no right to recommend to either house what action each should take with its own members who were involved. It is expected that each branch of the Legislature will take up this matter on its own account.

Claims were refuted that the bill authorizing the purchase of the Cambridge Subway by the State from the Boston Elevated was a "steal," and that the $7,868,000 paid for it went into the pockets of "State Street financiers." The evidence showed that the money paid by the State is being legitimately devoted to capital improvements by the trustees of the Elevated, under the control of the Public Utilities Board. As the expressed and understool purpose of the purchase was to provide capital for the trustees to use for necessary improvements, no criticism is attached to anyone on this score. It was shown that the rental being paid to the State by the company for the use of the subway, not only pays the interest on the State's investment, but also provides a sinking fund, which will ultimately retire the whole indebtedness, and leave the commonwealth the owner of the subway without cost to itself.

The committee recommended that the Legislature adopt a joint rule which will clearly define the rights and duties and members hereafter, with regard to purchase or ownership of stock in corporations, when legislation affecting them must be voted on.

Ten-Cent Cut in Toledo

Union Insists on Arbitration Although Matter Would Appear to Be Self-Adjusting

After more than a month of parley in which time the employees of the Community Traction Company at Toledo, Ohio, turned down one offer of a wage cut of 2 cents an hour from their maximum of 60 cents, company officials put into effect a reduction of 10 cents making the scales 45, 47 and 50 cents beginning May 23. The union submitted to the cut only on consideration that the disputed wage question shall be arbitrated according to the terms of the Milner service-at-cost ordinance.

Frank R. Coates, president of the railway, declared that he saw no need of arbitration, under the terms of the ordinance, which provides that all salaries and wages shall be based on rates prevailing in other cities. He put the matter before the board of control for final action as to whether or not arbitration should be resorted to.

Edward McMorrow, member of the executive board of the "Amalgamated," who has been spokesman for the union men, said:

> The union will accept as a maximum wage any award of the board of arbitration over the offer of 50 cents an hour.

This proposition is regarded as so ambiguous that it is doubtful if the board of control will go to the mat on such a question. If the board should agree to open up the whole question of wages company officials believe that they will be able to secure a larger cut than is made in the proposed scale.

The cut in wages is only 18 per cent as compared with cuts of 20 per cent in Cleveland and Detroit, the rates in which cities have always governed Toledo wages on a differential basis.

Many of the working conditions forced into agreements during the war period are also omitted from the proposed agreement at Toledo. Two weeks' vacation with pay is also cancelled and special provisions for overtime rates and runs are also changed.

The board of control and Street Railway Commissioner W. E. Cann have taken no part in wage negotiations up to this time and it is possible that they may decline to step into the controversy unless the interest of the public is at stake.

By dating of the wage contract from May 21 rather than April 1, the Toledo negotiations now follow those of Cleveland and Detroit.

The 1920 wage rate was 54, 56 and 60 cents. The new scale is 45, 47, and 50 cents an hour. Common labor rate in Toledo is now 35 to 45 cents an hour.

Wage Reduction Accepted Gracefully

Foregoing their contract with the company in order to accept a reduction in wages, motormen and conducters of the Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa., have accepted a voluntary reduction in wages of 5 cents an hour, retroactive to May 1. The pay will now be 66 cents an hour. The men's old contract had some time to run.

About a year ago, when the wage was 54 cents an hour, the company set aside its contract with the men in order to increase their wages to 71 cents an hour. The interurban line is headed by David J. McCahill, and the employees said they took the cut in appreciation of the treatment accorded them by the company and its president.

On the men's initiative the reduction was made retroactive to May 1, although President McCahill said he would be satisfied to have it begin May 16. They also offered to take a greater reduction if it should prove necessary. Approximately 450 men are affected.

The employees of this road operate under a plan which provides for their participation in the profits of the company different from most other plans of the kind. This plan was described at length in the ELECTRIC RAILWAY JOURNAL for March 27, 1920, page 664.

Approves of One-Man Cars.—The Rhode Island Company, Providence, R. I., has received authorization from the Public Utilities Commission to operate one-man cars in Woonsocket and Pawtucket. The petition was made after President Wood, of certain Bay State lines, notified the Rhode Island Company that one-man cars would be run over their lines into the cities of Woonsocket and Pawtucket.

New Home for Railway

Company at Los Angeles Will Soon Occupy Top Five Floors of New Structure

Up-to-date architectural and engineering features are embodied in the new building of the Los Angeles (Cal.) Railway at Eleventh Street and Broadway, into which the company is now moving. The structure is of class "A" reinforced concrete construction.

The building is 176 ft. long and ten stories high. It has the greatest area of frontage on Broadway of any building in the city. It is of "flatiron" type, measuring 65 ft. on the south end, which fronts on Eleventh Street, and 30 ft. on the north end. The center of this north end is on the center line of Broadway extending from the tunnel at Temple Street to Tenth Street and affords an impressive view down the main artery of Los Angeles.

LOS ANGELES RAILWAY'S NEW HOME

A granite base supports the two lower stories of terra cotta and the six-story shaft of brick exterior extending to the ninth floor. The two top stories have a terra cotta finish with colored decorative pilasters and figureheads at the four corners of the building. The main supporting columns of the building are 28 in. and 30 in. square.

The main floor will be devoted to stores. The second to fifth floors will have general offices and the Los Angeles Railway will use the top five floors. Several features particularly adaptable for the railway are included in the architecture.

There will be no assembly room for lectures, with blackboards, maps and other equipment to be used by the instruction department.

The railway's library for employees will be on the sixth floor. The medical department will be equipped for using an X-ray machine and other modern electrical equipment of the profession. A specially constructed sound-proof room will be used by the auditing department for the punching and sorting machines.

Occupancy of the new building will centralize the offices of the railway, as the instruction department is at present located at Sixth Street and Central Avenue. This will leave only the five carhouses, the shops and electrical construction and repair department outside the main offices. Noerenberg & Johnson are the architects.

$200,000 for Improvements

Federal Judge English, sitting in East St. Louis, Ill., has approved an appropriation of $200,000 for the betterment and replacement of property of the Alton, Granite & St. Louis Traction Company, after a personal inspection of the company's property made with W. H. Sawyer, Fred Allen and C. B. Thomas, receivers for the company. Of the appropriation $80,000 will be used for repair work and the purchase of one-man cars for use in the city of Alton. A new bridge, costing $15,000, will be built at Woodriver, Ill. Judge English recently made permanent the temporary receivership under which the company has been operating.

Disorder Rife in Albany

After perhaps the worst outburst of rioting and violence since the beginning of the strike waged by the employees of the United Traction Company, Albany, N. Y., quiet and order again prevailed on May 23 with the state troopers and the city mounted police patrolling the business zones. Both day and night service has been resumed by the railway.

The riots on May 19 and 20 followed a recent campaign to oust the jitneys from the streets. This campaign instituted by police authority proved unpopular and as a result the cars were battered with flying rocks and stones and the non-union crews had to desert their posts for safety. Though police reserves were immediately summoned and troopers from Troy were rushed to the scene, several persons were injured and many cars were wrecked before order was restored.

Frankford Lease Probably Best

Director Twining of the Department of City Transit, Philadelphia, Pa., at a recent hearing submitted to twenty-eight questions put by E. E. Ziegler, president of the North Philadelphia Business Men's Association, on the proposed temporary lease of the Frankford elevated and Bustleton surface lines to the Philadelphia Rapid Transit Company. The director declared that the lease as now drafted would not hold up the operation of the Woodland Avenue line and the Chestnut Street subway. He said further that the lease was in fact only a compromise, but that it was the best that could be arranged. Mr. Twining emphasized the fact that the lease under consideration would be rewritten after the Public Service Commission had determined on the Philadelphhia Rapid Transit valuation.

Additional Transit Acts Approved

Governor Miller of New York on May 6 signed two bills relating to New York City transportation matters. One was the Burling measure, which authorizes the creation by the Westchester County Board of Supervisors of a commission of seven members to arrange for improved transportation service by railroad or electric railways between New York City and points within Westchester County.

The other bill is the Walker measure which amends the rapid transit act with reference to payment for work done. This measure is aimed to meet conditions which may arise as a result of the eventual adoption of the unified system which is to be created by the new transit commission. It provides that where the Rapid Transit Commission shall have failed to certify a voucher for the payment of money a proper or sufficient voucher shall not be a condition precedent to the liability of the city.

$1,643,000 to Be Spent in Portland

The Portland Railway, Light & Power Company, Portland, Ore., announces that reconstruction work, improvement, extension and maintenance either now under way or already authorized and ready to be undertaken in the near future will entail expenditures of between $1,500,000 and $2,000,000. The following projects are included in the exhaustive plan for 1921:

New steam turbine of 12,500 kilowatt rated capacity installed in Station "L," work now under way	$400,000
Replacement of 50,000 ties on lines of the interurban system, now under way	75,000
Bridges and buildings and maintenance work on the interurban system, now under way	150,000
Maintenance of way work on the Portland city car lines, now under way	350,000
Reconstruction and repaving of car tracks on First Street, from Alder to Madison	36,000
Reconstruction and repaving of Third Street from Washington to Glisan, authorized	52,000
Reconstruction and repaving of East Twelfth Street from Hawthorne Avenue to Milwaukee Avenue, contract let	36,000
Reconstruction and repaving of Woodward Avenue from Grand Avenue to East Tenth Street, now under way	20,000
Reconstruction and repaving of Vista Avenue from Spring Street to Patton Road, just completed	14,000
Repaving on Main Street, Oregon City, under way	5,000
Rebuilding trestle on Oregon City line, under way	4,000
Repairing and repainting over 50 stations and waiting-rooms on the various interurban lines, now under way	5,000
Reconstruction and repaving of Killingsworth Avenue from Interstate Avenue to Greeley Street in prospect	57,000
Reconstruction and repaving of Ravensview Drive from Greenway Drive to Elizabeth Street, in prospect	20,000
Reconstruction and repaving of East Lincoln Street from East 54th to East 57th Street, in prospect	16,000
Reconstruction and repaving of Twenty-seventh Street from Thurman to Upshur Street, contract let	3,000
Other work	400,000
Total	$1,643,000

News Notes

Franchise Negotiations Renewal.—The conferences have been renewed looking toward the drafting of a new franchise for the Grand Rapids (Mich.) Railway. At a recent session General Manager De Lamarter is said to have been inclined to the insertion in the franchise of a four-tickets-for-a-quarter proviso with a charge of 10 cents for transients, until the company has made good its accumulated losses from operation.

May Establish Car Service. — The Interstate Electric Corporation, which owns the San Angelo (Tex.) Water, Light & Power Company, plans soon to establish railway service in that city. This report is given credence by the placing of an order by the San Angelo Water, Light & Power Company for a 500-hp. oil-burning engine and electric generator. The new equipment will double the capacity of the San Angelo plant.

Minneapolis Veterans Organize.—The Veterans Club has been organized by old-time employees of the Twin City Rapid Transit Company, Minneapolis, Minn. One hundred and thirty-four men who had been more than twenty-five years in service were present at the first meeting. Nels J. Nelson, claim adjuster, was made chairman and F. A. Anderson, social service director, was temporary secretary. A committee was appointed to draw up the constitution and its members will be directors for the first year.

Investors Will Be Protected. — Each employee of the Beaver Valley Traction Company, New Brighton, Pa., and the Pittsburgh & Beaver Street Railway, Pittsburgh, Pa., recently received a notice from General Manager Boyce reminding the employee of the "Pull Together" motto of the company which makes each employee a booster of his company, fellow workers and management officials. Every man is urged to defend the company in a courteous manner and to secure the names of people who make erroneous statements about the company, and the management will be glad to send a letter or have an interview with such complainants to inform them of the truth. The manager announces that for the first three months of this year the Pittsburgh & Beaver Street Railway and the Beaver Valley Traction Company had a combined loss of $6,845.

Funds Needed for Transit Facilities.—E. W. Edwards, president of the Rapid Transit Commission, Cincinnati, Ohio, at a recent meeting before the business men of the city declared that a bond issue of $3,000,000 in addition to the amount paid by the abutting property owners would probably go before the public at the August primary election for the purpose of boulevarding the canal. He discussed the outlay of funds of the commission and just what accomplishments were expected. He said that the operation of the loop by the Cincinnati Traction Company would mean many years of court action and that the commission had decided to go ahead with the work on the canal and leave the question of operating until such time as the traction company had reduced fares to a lower limit. Speaking on the cost of the rapid transit system, Mr. Edwards said the commission had spent $542,000 for property, and that contracts had been let for the first four sections totaling $2,079,000. Of these contracts, there had been $977,000 worth of work already completed. This had left the commission a balance of approximately $3,500,000 with which to push the completion of the loop.

Programs of Meetings

American Institute of Electrical Engineers

The American Institute of Electrical Engineers will hold the thirty-seventh annual and Pacific coast convention at Salt Lake City, Utah, on June 21-24. A tentative program has been arranged, including an address of welcome by Charles R. Mabey, Governor of Utah, and an address by President Berresford. The entertainment program will consist of sight-seeing trips to Great Salt Lake and Salt Lake Valley, where members can inspect a mining canyon. An opportunity will also be afforded the members to see the largest outdoor substation in the world, the property of the Utah Power & Light Company. Various technical papers will be read on each of the convention days.

New York Electric Railway Association

The thirty-ninth annual meeting of the New York Electric Railway Association will be held at the Fort William Henry Hotel, Lake George, N. Y., on June 11. The meeting will convene on the arrival of the delegates who come by the morning train. Reservations so far received far and away exceed the number enrolled for previous years' meetings of the association so long in advance of the date of the meeting. Various subjects will be discussed, special attention being given to the questions of one-man car operation and taxation in its different phases.

The entertainment features for the men will not be started until the conclusion of the business sessions. The ladies will have bridge parties and will enjoy golfing, boating and other outdoor sports such as the territory around Lake George affords.

Requests for hotel accommodations should be made as early as possible to Charles A. Douglass, manager, Fort William Henry Hotel.

Financial and Corporate

$1,000,000 Lost by Seattle

City Running Steadily Behind in Its Operation of the Seattle Municipal Railway

According to the 1920 annual report of Seattle's superintendent of public utilities, the operating revenue of the Municipal Street Railway showed a gain of 31.4 per cent over the previous year. This increase was due principally to the fact that the 5-cent fare was changed on July 24, 1920, to a 7-cent cash fare with four tickets for a quarter or two cash fares for 15 cents.

Notwithstanding this increase in revenue it was impossible to keep the expenses of operation to less than 102.2 per cent, with the result that the net loss for the year was nearly $1,000,000. If the previous deficit in the profit and loss account is added the total deficit since the city took over the operation amounts to $1,236,284. The accompanying tables speak for themselves and show the detail of operation for the past two years.

In referring to the jitney situation the report recommends that some action be taken whereby the system may be regulated and the operators compelled to live up to such regulation.

WOULD BAR JITNEYS

Jitneys, the report says, should not be allowed to operate on the same street on which car lines are located, as there is a sufficient amount of equipment in the railway department to take care of all travel on any line operated without the assistance of jitneys. There are, however, a few outlying districts which at this time are not served by the Municipal Railway, and in such locations the jitneys could legitimately operate, provided they are compelled to pay a certain percentage of their earnings to the city for the right to operate over the streets, as they are operating simply for the purpose of making money and are not in the same class as a privately owned machine.

Substantial decrease in the number of accidents on the car lines during 1920 as compared with the previous year is shown by the report. The total number of accidents in 1920 was 6,511, as against 7,291 in 1919. The number of collisions with cars, 246; collisions with vehicles, 2,976; collisions with pedestrians, 205; injuries on cars, 317; step accidents, standing cars, 403; derailments, 231, and miscellaneous, 680. There were 106 ejectments of passengers for which damage claims were filed and six fatalities among passengers and trainmen against nine in 1919.

The traffic handled during the year was 122,866,577 passengers as against 133,176 297 the previous year. Revenue passengers decreased 9,114,648, while free passengers increased 363,297 and transfer passengers decreased 1,558,369. To handle this traffic 15,829,054 car-miles in 1,765,635 hours were operated as against 16,162,539 miles in 1,771,138 hours the year before. The average speed of cable cars for the year was 6.47, for electric cars 9.17 and the average for all services 8.97 miles per hour.

INCOME AND PROFIT AND LOSS STATEMENT—SEATTLE MUNICIPAL RAILWAY

	1920	Per Cent of Total Operating Revenue	Per Cent Change Over Previous Year	1919	Per Cent Total Operating Revenue
Operating revenue:					
Passenger	$5,283,658	96.72	31.1	$4,030,602	96.94
Firemen and police	54,000	0.99	42.1	38,000	0.91
Special cars	1,698	0.03	260.0	471	0.01
Mail service—postal employees	9,388	0.17	51.0	6,213	0.15
Express revenue—newspapers, etc.	8,770	0.16	122.0	3,948	0.09
Freight	39,977	0.73	24.6	32,112	0.77
Miscellaneous transportation	1,055	0.02	*67.5*	3,264	0.89
Auto bus revenue	12,218	0.22	4349.0	275	0.01
Total from transportation	$5,410,764	99.04	31.5	$4,114,885	98.96
Non-operating revenue:					
Station and car privileges	17,158	0.300	32.6	12,947	0.31
Rent of equipment	105	0.002	*96.9*	3,523	0.09
Rent of track and facilities	24,089	0.400	15.1	20,938	0.50
Rent of real estate	96	0.002	*98.0*	4,638	0.11
Power sold	465	0.008	*19.7*	579	0.01
Miscellaneous revenue	723	0.010	12.5	643	0.02
Lost and found department	1,680	0.030	....	......	.....
Miscellaneous rent revenue	8,312	0.150	....	......	.....
Total	$52,628	0.96	2.2	$43,268	1.04
Total operating revenue	$5,463,392	100.00	31.4	$4,158,153	100.00
Operating expenses:					
Way and structures	$457,105	8.18	61.8	$282,993	6.93
Equipment	734,017	13.16	38.9	528,507	13.00
Power	683,934	12.24	22.5	558,528	13.70
Conducting transportation	2,644,291	47.45	35.5	1,950,460	48.00
Traffic	3,273	0.05	47.0	2,228	0.05
General and miscellaneous	362,547	6.49	48.0	245,109	6.01
Auto bus expense	22,956	0.41	2437.0	904	0.07
Depreciation	677,179	12.12	35.7	499,173	12.29
Total	$5,585,302	100.00	3.73	$4,067,903	100.00
Gross income	*121,910*	.....	*235.5*	90,250	.....
Deduction:—					
Interest on general bonds	35,750	.....	53.5	23,281	.....
Interest on revenue bonds	823,000	.....	42.0	579,684	.....
Discount on funded debt	6,908	.....	199.0	2,314	.....
Interest on warrants due	2	.....	*99.9*	2,145	.....
Total	865,660	.....	42.5	$607,424	.....
Net income to P & L	*987,570*	.....	*91.0*	*517,174*	.....

$2,000,000 of Stock to Monongahela Patrons

George M. Alexander, president of the Monongahela Power & Railway Company, Fairmont, W. Va., has announced that $2,000,000 of preferred stock of the company will be offered to patrons for subscription. The company is the successor to the Monongahela Valley Traction Company, the change in name having been made so as to reflect more accurately the operations of the company.

The preferred capital stock of the company has recently been increased from $4,000,000 to $8,000,000. Of the increase approximately $2,000,000 has been made available for purchase by the patrons of the company in the communities served by it.

In announcing the change in plan Mr. Alexander said in part:

> The company in adopting this policy, making it possible for its customers to acquire its stock, feels that the patrons of its railway lines, the users of its power, electric light and gas are entitled to participate in the profits arising from such service for the following reasons:
>
> 1. So that the company and the public it serves shall be partners in fact in order that the service rendered shall respond to the demands of the public.
> 2. So that the actual ownership of the property shall be vested in the people upon whom the company depends for patronage.
> 3. So that the profits (or wages paid for the use of capital) of the company shall be returned to the people who make these profits possible by their patronage.
> 4. So that the company and the public may work in closer co-operation for the benefit of the territory served.
> 5. So that the money obtained from the sale of securities will be used where obtained and will go for purposes that will benefit the entire community.
> 6. So that the people of these communities may have a sound home investment for their capital and savings.

The par value of this stock is $25 per share and the patrons may purchase this stock at $19 per share. The stock pays dividends at the rate of 6 per cent annually on the par value, which makes the return at the above price nearly 8 per cent per annum. The stock may be purchased for cash or on a satisfactory partial payment plan.

Time Extended for Filing Inventory

The Indiana Public Service Commission has extended until June 15 the time in which the Indiana Railways & Light Company must file an inventory with the commission. Last January the commission ordered an inventory filed by March 15, and at the end of that time an extension until April 15 was granted. The company failed to report then and another extension was granted setting the date as May 15. The commission announced recently that it would instruct the engineering department to investigate the company's property and set the final date for filing the inventory as June 15.

Deficit Still in Toledo

Pay-Leave Fare Collection Proposed During Rush Hours—Commissioner Building for Permanency

Operations of the Community Traction Company, Toledo, Ohio, for the month of April showed a deficit of $72,730 after payment of all charges and fund accruals. The total decrease in gross revenue for the month was $14,229.

Earnings from operation for the month totaled 41.17 cents per car mile. Expenses of operation took 39.3 cents. The balance plus miscellaneous income gives 4.08 cents per car mile to meet taxes, reserves and fixed charges. The total passenger riders per car mile amounted to 8.14 exclusive of employees carried.

The operating ratio was reduced to 90.60 in April from 92.21 in February and 93.25 in March. With the elimination of the Huron Street line it is anticipated that this ratio will be less than 90. The maintenance and repair fund allowance is being arbitrarily maintained at 10 cents a car mile for the summer months.

Street Railway Commissioner McCann has outlined some of his plans for increasing economy. He is conducting operations on a strict business basis and is trying to do justice to the property itself rather than attempting to make a showing during the first few months of operation under the new service-at-cost plan.

During rush hours the pay-leave system of fare collection is to be used on the cars to speed up downtown loading. By having the cars pay-enter inbound the collection of fares would be eliminated in the congested district.

Safety rules may also be changed to allow loading of more than one car at a time at some of the downtown corners. A plan of complete downtown rerouting so as to separate railway and vehicular traffic is also being developed.

The new rate of 40 cents a car mile for interurban rental has become effective and the commissioner believes he can persuade the interurban companies to build a stretch of track on Jackson Avenue between Huron and Superior Streets to make a new loop for Detroit-Cleveland cars and several other lines now using a long loop through the congested district. It is estimated that the mileage saved at 40 cents per car mile under the new arrangement would save to the interurbans the cost of the track in less than a year. This plan if carried out would make Toledo's new interurban station approachable from both sides and greatly facilitate the speed of loading and dispatching cars.

Stock Dividend at Detroit

In connection with the stock dividend of 2½ per cent declared on the $15,000,000 of capital stock of the Detroit United (Mich.) Railway, it has been explained that in view of the abnormal business conditions prevailing the board of directors, notwithstanding the existence of a surplus of many million dollars represented in the value of its properties, deemed it prudent to proceed with extreme caution and to conserve the company's resources in every possible way and therefore decided to declare a stock dividend at 2½ per cent payable on June 1, 1921, in lieu of the usual cash dividend payable at that date.

$179,000 Loss in Buffalo

The International Railway, Buffalo, N. Y., shows a deficit for the three months' period ended March 31, 1921, of $179,924 against $77,822 for the corresponding period of 1920. Operation in 1921 so far presents none too bright a situation. For the two months ended Feb. 28 the company failed by $300,000 to earn the amount required and at the end of March, as is noted in the accompanying table, the gross revenues are insufficient by $466,576 to meet operating expenses, taxes, depreciation, etc. Mr. Tulley, president of the railway, in a recent statement announcing a wage cut for unskilled employees effective May 1, spoke of the financial distress of the company. He stressed the industrial depression which had been so acute that a falling off of 17 per cent was noted in the company's gross receipts.

STATEMENT OF EARNINGS OF INTERNATIONAL RAILWAY

Three months ended March 31:	1920	1921	Per Cent Change
Operating revenue	$2,418,022	$2,685,550	10.6
Operation and taxes	2,092,841	2,497,489	19.3
Operating income	$325,181	$188,061	42.4
Non operating income	5,092	7,863	54.4
Gross income	$330,273	$195,924	40.7
Income deductions	408,095	375,848	7.9
Deficit	$77,822	$179,924	131.1
The formula for the determination of a fair return upon the value of the property, adopted by the Public Service Commission when granting the 7c. cash fare—4 tickets for 25c., for the City of Buffalo, represents an annual sum of approximately $2,650,000. Proportion for three months	....	$662,500	....
Gross income for three months ended March 31, 1921	....	195,924	....
Amount by which gross revenues are insufficient to provide for operating expenses, depreciation and renewals, taxes, and this return upon the value of the property devoted to the public service	....	$466,576	....

The formula for depreciation and renewal adopted by the Public Service Commission when granting the 7c. cash fare—4 ticket for 25c., for the City of Buffalo, represents an annual charge of $1,016,000, and effective July 1, 1920, the monthly appropriation from earnings has been in accordance therewith.

	1920	1921	Per Cent Change
Comparative charge for depreciation and renewals for the first three months of 1921 and 1920, as included in "Operation and Taxes".	$99,998	$254,000	154.5

Massachusetts Roads Exempted From Excise Tax

An additional exemption of two years, 1922-23, from the assessment of the so-called commutation or excise tax in Massachusetts has been granted the street railway companies of that state by a bill just passed by the Legislature and signed by the Governor. During the severe financial crisis which confronted the companies two years ago they were relieved from the operation of this tax for the years 1920-21 by legislative enactment, and the present bill is in the nature of a further extension.

There was considerable opposition to the passage of the present extension, and the original bill was defeated. The speaker of the lower branch of the Legislature, B. Loring Young, who is exceptionally well acquainted with street railway financial conditions, himself took the floor on a motion for reconsideration, and so impressed the members with the necessity for continued relief from this tax that the measure was reconsidered and passed.

This tax is levied as a percentage of gross receipts, the maximum being 3 per cent, for the use of the various towns in which the street railway tracks are laid, to pay for maintenance of public ways and bridges. The tax is apportioned among the towns in the ratio of the mileage of track in each one.

Brief Filed in Suit for Restoration

Edward C. Turner, former attorney general of Ohio and now counsel for the Columbus Railway, Power & Light Company, Columbus, Ohio, has filed a brief of 128 printed pages in the suit of the company against E. W. Clark & Company, Philadelphia, Pa., former operating managers of the railway, to recover $2,737,621 or $2,655,040 depending upon which of two sets of claims is considered. The brief represents the summation of the controversy that has been in progress almost three years before Common Pleas Judge E. B. Kinkead and Master Commissioner George B. Okey, Columbus.

Mr. Turner charges that the Clarks underwrote and others invested. According to him "Columbus and the surrounding territory are full of suckers." He charges that for a quarter of a century the Clark interests exercised a control at Columbus through the proxy committee—"the very weapon by which they were finally unhorsed." According to Mr. Turner the management of the company was finally taken away from the Clark interests by Charles L. Kurtz, the present president of the Columbus Railway, Power & Light Company, and by D. Meade Massie, Chillicothe, Ohio.

The brief is considered one of the most remarkable documents ever submitted in a suit brought in Franklin County, particularly in a civil suit. It is replete with the reiteration of charges of mismanagement on the part of the former operators. Mr. Turner says that "throughout a busy career covering the trial of many cases where brains were combined to circumvent justice, I have never encountered an abler witness or one who could play a better game of mental chess on the witness stand than Mr. Clark. But truth is mighty and will prevail."

Counsel for E. W. Clark & Company have not yet filed their brief in reply.

Miami Traction Has Quit for Good

The Miami Traction Company, which ceased operating the electric railway in Miami, Fla., following the fire that destroyed its plant, carhouse and some equipment more than a year ago, will "never operate another car in Miami," S. M. Tatum, treasurer of the company, told the Civic Voters League at a meeting which he was invited to address. Mr. Tatum discussed the traffic situation from the standpoint of the company. He did not touch on the latest development—the suggestion that the Carl G. Fisher interests owning the Miami Beach Electric Company take over the franchise and track of the Miami concern.

Mr. Tatum described how the City Council had failed again and again to provide protection for the company from the inroads into the transportation business made by the jitneys, and how at last the Council had refused to call an election on the question of buying the car line although petitioned to do so by the Chamber of Commerce, the Rotary Club, the Real Estate Board and several hundred citizens. It even refused to accept the report favorable to municipal ownership brought in by a committee of citizens appointed under the Council's own direction to investigate the traction situation and make recommendations for a resolution.

The speaker ventured the opinion that no company could be induced to come in and take over the railway franchise unless the jitneys were legislated off the streets. The franchise, he said, is very severe, anyway, and had been looked upon unfavorably by railway operators to whom it had been shown.

The last direct offer made by the company to the city was to sell the tracks to the city for $75,000, and the cancellation of debts owned by the company to the city. These debts total about $14,000.

Abandonment Ahead

The critical situation regarding the railway at Lafayette, Ind., took a new turn recently when it was announced that the Northern Indiana Gas & Electric Company has bought the railway's power plant at the foot of South Street and had taken an option on the car lines, effective until June 10.

Clarence H. Geist, president of the Northern Indiana Company, has conferred with George R. Durgan, Mayor, and the members of the Board of Public Works and told them that his company had persuaded the Terre Haute, Indianapolis & Eastern Traction Company to take over the railway lines and operate them as lessee providing the city will guarantee the company protection from the competition of jitney buses.

The alternative to the offer made the city by the Northern Indiana Gas & Electric Company and the Terre Haute, Indianapolis & Eastern Traction Company is complete abandonment of the railway. The Northern Indiana Company plans to dismantle the power plant and take over its business at the newly enlarged power station of the Northern Indiana Company. The plan is to have the railway buy power from the Northern Indiana Company.

Financial News Notes

Short Abandonment Approved.—The Board of Public Utility Commissioners of New Jersey has granted permission to the Millville Traction Company to abandon 0.8 of a mile of track and relinquish the franchise on South Second Street, Millville, at the end of the line.

Cannot Abandon Service.—The State Public Utility Commission recently refused permission to the Bridgeton & Millville Traction Company, Bridgeton, N. J., to cease operation on its line between Newport and Bivalve. Vigorous opposition was voiced to this abandonment by residents along the route.

Westford to Contribute to Railway.—The town of Westford, Mass., has secured authority from the Massachusetts Department of Public Utilities to contribute the sum of $1,829.23 toward the cost of operation and the fixed charges of the line of the Lowell & Fitchburg Street Railway within the limits of that township.

Successor Company Chartered.—The Abilene (Tex.) Traction Company has been chartered with a capital stock of $100,000 to take over the property of the old traction company which failed and which has not been operated for two years or more. The incorporators of the new company are J. N. Burjac, Price Campbell and G. W. Fay.

Sale Under Foreclosure Restrained.—The sale of the property of the Standard Traction Company, Dallas, Tex., under foreclosure proceedings to satisfy a judgment for $5,000 obtained by C. F. Farmer and wife in the District Court of Dallas County, has been stopped by the granting of a receivership for the property. This action was taken by Judge W. F. Whitehurst upon application of the Power Investment Company, holder of a first lien for $10,000 upon the property. George P. Dunlap has been appointed receiver for the company.

$5,000,000 Milwaukee Bonds Offered.—A syndicate of bankers, including Dillon, Read & Company, Harris, Forbes & Company, Inc., and Spencer Trask & Company, New York, N. Y., offered for subscription on May 12 $5,000,000 of twenty-year 7½ per cent refunding and first mortgage gold bonds, series A, of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., dated June 1, 1921, and due June 1, 1941. The offering price was 95 and interest yielding more than 8 per cent. A semi-annual sinking fund will retire 2 per cent per annum of the bonds until June 1, 1926, and 1½ per cent per annum thereafter if obtainable at or under par and accrued interest. The trustee of the issue is Central Union Trust Company, New York. The bonds become a first lien on the company's entire property by Dec. 1, 1931.

$4,500,000 of Portland Bonds Offered.—The National City Company, New York, N. Y., is offering for subscription at 96 and accrued interest, yielding more than 7.85 per cent, $4,500,000 of first lien and refunding mortgage gold bonds of the Portland Railway, Light & Power Company, Portland, Ore. The bonds are dated May 1, 1921, and are due May 1, 1946. Interest is payable May 1 and Nov. 1 at the office of the National City Bank, New York. The bonds are known as series A and bear interest at the rate of 7½ per cent. The net earnings of the company are said to be more than twice the annual mortgage bonds interest charges. Associated with the National City Company in offering the bonds was Halsey, Stuart & Company, Inc., New York. The bonds were advertised for public subscription in the newspapers of May 13. In the advertisements it was explained that the Portland City Railway system is showing a substantial earning power and that the Public Service Commission of Oregon had valued the properties of the company at a figure which was more than 150 per cent of the outstanding mortgage debt including the present issue.

Southern Indiana Bonds Offered.—The National City Company, New York, N. Y., is offering for subscription $1,000,000 of first lien and refunding mortgage gold bonds of the Southern Indiana Gas & Electric Company, Evansville, Ind., the successor to the Public Utilities Company. The subscription price is 94 and accrued interest, yielding more than 8.10 per cent. The bonds are dated April 1, 1921, and are due April 1, 1941. The company owns and operates without competition the electric light, power, gas, street railway and steam heating properties in Evansville. It also does electric light and power business in nearby communities and operates an electric interurban railway. The bankers say that on the basis of appraisals by independent engineers the replacement value of the property is substantially in excess of the present mortgage debt of $5,630,000. The equity is represented by $335,000 of 6 per cent debenture bonds, $2,527,300 of outstanding preferred stock, and $3,000,000 of common stock.

Traffic and Transportation

Jitney Regulation Attacked

Operators Appeal to State Supreme Court in Effort to Nullify City's Ruling

The Supreme Court of the State of Washington set May 19 as the date for hearing the appeal of the Seattle jitney drivers from the verdict of the King County Superior Court subjecting them to regulation by the City Council. A decision is not expected, however, for sixty days, the time usually elapsing between hearing and ruling. The city was represented by George A. Meagher, city attorney in the litigation that developed last summer, when the city attempted to enforce an ordinance submitting the jitneys to drastic regulation. He argued the case before the higher court. As the case involves the city's rights to exercise police powers municipal officials are confident they will win.

Under an ordinance passed a year ago the city forbade operation of jitneys except under licenses, subject to conditions which the jitneurs alleged virtually made it impossible for them to continue running. The jitney operators sued for an injunction in the Superior Court to restrain the city from enforcing the ordinance, but the injunction was denied. An appeal was taken, and operation of the ordinance has been suspended pending the appeal, the jitney buses running without municipal supervision.

Under the ordinance requiring permits a majority of the members of the City Council last summer showed a disposition to keep all the jitneys off the streets, refusing licenses except to a few drivers, and curtailing their runs to routes that would serve as "feeders" to the municipal railway.

Ten-Cent Plea May Be Renewed

Upon motion of Judge C. P. McIntyre, special counsel for the city of Montgomery, the Public Service Commission of Alabama recently granted a rehearing of the original petition of the Montgomery Light & Traction Company for authority to advance fares to 10 cents and institute a service-at-cost plan.

May 17 was set as the date for the rehearing for the traction company and the city of Montgomery to submit further evidence in connection with the petition of the company, but this date was later changed. The petition of the company has been so amended that should the public service body finally decide it has no jurisdiction in the matter of granting a rate that will create a reserve fund for the company application will be made for a straight fare of 10 cents, or such a fare as the commission may decide is a fair and just return on the company's investment.

Ray Rushton, receiver of the railway, addressing the commission in behalf of the company, stated he was surprised that the commission had "thrown the original petition out of court" on what he termed a "technicality." A. G. Patterson, president of the commission, replying to Mr. Rushton, reiterated the commission's position that it had no jurisdiction in the establishment of the proposed service-at-cost plan. Mr. Rushton then stated that if the commission felt it was not authorized to pass upon the service-at-cost plan then he, as receiver for the company, would ask the commission to authorize a fare of 10 cents or whatever amount the commission may decide is a fair return on the investment of the company. He added, however, that he hoped the service-at-cost plan would receive the commission's endorsement, and referring to the 10-cent fare stated it is now in operation in 120 cities in the United States.

Three Cents a Mile Fare Granted for Fast Line

The Public Service Railroad, Newark, N. J., operating the so-called fast line, was allowed a three-cents-a-mile fare on May 20 by the Public Utilities Commission. The present minimum fare of 10 cents was continued.

The board held that inasmuch as the valuation made of the railroad property showed that the increase of 0.4 cents a mile was warranted and that there was no opposition it saw no reason to withhold the extra fare. Hearings will be continued, however, to fix definitely a just and reasonable fare.

In this proceeding the decision is based upon the value of the physical property of the company, which the board found to be $2,524,755. Against this are outstanding securities amounting to $2,296,650. The decision states that the value of the physical property without any allowance for intangibles of any kind is in excess of the total amount of the securities issued.

For the year 1920 the company showed a loss, after payment of operating expenses and income deductions, amounting to $66,395 and for the year 1919 the net loss was $85,313. With the increased fare proposed it is estimated that there will be a net loss of more than $9,000. The board holds, said Secretary Barber, in a synopsis, that the proposed rates are not unjust or unreasonable and will not produce an excessive return on the physical value of the property. The schedule of rates filed is allowed to become effective on June 1.

More Bus Feeders

Self-Preservation Measure Taken by Pacific Electric Railway—Six-Cent Fare with Transfers to Railway

Additional bus line feeder service has been commenced, experimentally and on a small scale, by the Pacific Electric Railway, Los Angeles, Cal., in connection with its rail lines, and in competition with motor lines, as a matter of self-protection. The present plan has in view immediate relief for the Hollywood district of the city of Los Angeles, which is at present without electric railway service.

LOCAL BODY URGED SERVICE

The appeal of the company to establish the service was made to the Los Angeles Board of Public Utilities on May 10 in the form of a request for motor bus line reaching from Sunset Boulevard and Western Avenue to the Los Felix boulevard at Griffith Park, the largest park in the city established in the outlying section, attracting a large volume of travel, but reached only by automobiles at present.

In the company's application, which is formally made by the Pacific Electric Land Company, it is stated that this motor bus service is to be operated in conjunction with the electric railway now serving the Hollywood district. Approximately 2 miles will be covered by the motor bus line. At least two motor buses will be placed on this new route when it is established. The buses will operate every twenty minutes, and during the two rush hours in the morning and evening the buses will have a headway of fifteen minutes, it is declared. During the weekdays the bus line will operate between the hours of 6.30 a.m. and 11:30 p.m.; on Sundays the hours of operation will be between 7 a.m. and 11.30 p.m. It is anticipated that a fare of 6 cents will be charged on these buses, and it is declared by the company in its application that transfers will be given on its electric car line, good for transportation on the motor buses and vice versa. The buses, it is stated, will be the latest model, with pneumatic tires and a passenger capacity ranging from nineteen to twenty-three persons. If the bus line application is granted this will make the second feeder line of the kind operated by the company as it is now operating autos between San Bernardino and Highland, some 9 miles.

THROUGH FARES NOW IN EFFECT

In this connection the company has just announced that it has published and put into effect its through fares and joint ticketing arrangements for the making of connections with the auto stages of the San Bernardino Mountain Stage Line, which operates stages from San Bernardino to a large number of mountain resorts in the San Bernardino Mountains; also, similar arrangements for the company's trains to be met by the auto stages of the Cregar Auto Stage Lines at Riverside, operating auto stage lines between Riverhead and the mountain resorts in the

San Jacinto Mountains. By this arrangement the running time is reduced 45 minutes as compared with the trip entirely by auto stage.

In discussing this question it is of interest to note that the bill to tax motor freight and passenger lines 2 per cent of their gross receipts, less local taxes, is now before the Governor for his signature. The motor transit companies claim this proposed 2 per cent tax on motor carriers would be "confiscation of property without due process of law."

New Five-Cent Lines Started by Boston "L"

A 5-cent fare for local riders will be instituted on the Medford and Somerville lines running to Sullivan Square Terminal of the Boston (Mass.) Elevated Railway on Saturday, May 28. Plans of the trustees to extend this experimental low-fare service to this district were announced in these columns several weeks ago. Six main lines, and several rush-hour tripper routes will be affected.

It is known that the trustees have under consideration plans for starting this 5-cent fare service in other districts, from time to time, unless the present experiments should prove unsuccessful. It should be understood that the regular fare for a through ride from any district to Boston, as well as regular fares on city lines, is still 10 cents. It was recently stated by General Manager Edward Dana that less than 3 per cent of the total passengers were riding for 5 cents. This change in Medford and Somerville, however, will undoubtedly increase the percentage.

In a statement issued to the public advising of the new system in Medford and Somerville, Mr. Dana said:

> This experimental method offers a means of separating through traffic from local traffic and thereby permits a different rate of fare. Its success will depend entirely upon the amount of local revenue produced.
>
> Modifications will undoubtedly be necessary as the results of the experiment are known.
>
> Sufficient new business must be secured so that the new rates of fare will not be a burden upon the present 10-cent car riders of the system.
>
> The success of the plan rests entirely with the car riders of the district, and in view of the fact that the experiment is one along broad lines of a progressive nature, if sufficient new traffic is not received it will be conclusive proof and offset previous theories.

"Ain't It Discouraging"

In a recent issue of *Trolleygrams*, a leaflet issued by the Dallas (Tex.) Railway, has this to say about presenting the exact fare as a means of speeding up traffic:

> When the car stops and there are eight or ten people waiting to get on—and you have your 6 cents in your hand—and several of your friends have their exact fare all ready—and it looks like "easy sailing"—and then a feller in front of you pulls a five-spot on the conductor and wants change—and you have your foot on the step—and the rest of the crowd is waiting in the street—Gee! Don't you wish that everybody could remember to have the exact fare ready?

Emergency Plea Disallowed

Ten-Cent Fare Refused to Public Service Railway by New Jersey Board

The application of the Public Service Railway, Newark, N. J., for permission to charge a 10-cent fare on its lines in New Jersey was denied by the Board of Public Utility Commissioners on May 20. At the present time the fare of the company is 7 cents, and it asked permission to increase this to 10 cents.

It is held by the board that no such critical condition exists in the company's affairs as would require the application of the 10-cent rate, or any other emergency rate at this particular time.

There were two proceedings pending before the board, in which the company's rates were involved. One was the application disposed of on May 20, which was predicated upon the existence of an emergency. The other is the action instituted by the board, in which it proposes to fix just and reasonable rates for the company, and in which the valuation of the line must necessarily be one of the bases to be considered.

The board in its decision stated that there have been so many variations in the rates charged by the company within the last few years that it becomes pertinent to inquire whether or not such an emergency exists as to necessitate immediate disposition. Reference is made to the fact that emergency rates were allowed the company at a time when the country was at war and a crisis was imminent.

At that time it was held that additional revenue was necessary, and the boards holds that it now must be satisfied that a similar emergency exists if any new rate is to be approved. In the pending proceeding involving valuation, a finding will result upon the full consideration of all factors, and this proceeding must be terminated not later than July 14.

In its finding the board said:

> The board is unwilling to extend the emergency doctrine made necessary, as it was, by the government increasing wages as a war measure, at least until it is shown that an increase in rates is imperatively needed to render safe and adequate service to tide the utility over until a just and reasonable rate can be fixed after all the elements involved in the making of such a rate have been considered.
>
> The board does not consider an allowance for many of these items appropriate in an application of this kind. They do not constitute elements of emergencies and more appropriately deserve consideration in the fixation of just and reasonable rates rather than "emergency" rates. The board, therefore does not approve of the schedule of rates filed by the company.
>
> Nor is there, in the opinion of the board, such an emergency present as would require it to fix any other rate in excess of the existing rate without consideration of all of the elements recognized as being entitled to consideration in a proceeding to fix a just and reasonable rate. The rate proceeding which was begun by the board and is now pending has consumed more than two years. Supplementing the vast amount of testimony as to value which has been taken in this proceeding, there has been filed with the board the valuation fixed by the engineers engaged pursuant to the legislative enactment of 1920.
>
> This proceeding must be terminated by the board not later than July 14. The case will necessarily have to be proceeded with as rapidly as possible and under all conditions a result based upon the investigation with a full consideration of the various factors necessarily requiring consideration for the fixation of a just and reasonable rate would be more just to both the public and the company than one based upon the few factors presented in and necessarily the only ones considered in emergency cases.

A writ of certiorari to review the action of the commission in refusing a 10-cent fare was granted on May 21 by Supreme Court Justice F. J. Swayze in Jersey City. Application for the writ was made by Frank Bergen, general counsel for the Public Service Corporation, of which the railway company is a subsidiary.

Edward Herman, who is the counsel for the commission, opposed the granting of the writ. He said that the investigation made by the commission showed that the company could maintain adequate service at the present rate of fare. The writ is returnable on May 28.

Thomas N. McCarter, president of the company, issued a statement to the public in which he said in part:

> A property that has been starved under forms of legal procedure for three years past can, perhaps, continue to subsist on limited rations for seven weeks more, but to the extent that the premises of the board and the legal principles adopted by the board are in conflict with the law, they should be corrected by the proper tribunal to the end that justice may be done.
>
> In substance, the board holds that, by estimating a gross increase in the company's business for the current year far in excess of that justified by the portion of the year which has expired, or by any facts indicating any such increase, and by a further paring down of the estimated operating expenses to the very bone, which, of course, must reflect itself in less efficient service, the company will have enough revenue to pay its operating expenses.
>
> And in addition to its operating expenses, the board holds that it will have enough for its fixed charges, and $510,000 for replacement and renewals. Not a cent is provided for return upon the stockholders' investment of $50,000,000.
>
> Under these conditions, the company is without credit and unable to obtain capital. If the basis on which this report is made can be sustained, and is to be a criterion of operations directed by the board, there is no hope for the Public Service Railway, and, in my opinion, none for the public regulation of utilities.

Toledo Bus Men Attempt to Trick City

Bus owners of Toledo, Ohio, have failed in their attempt to bring to a referendum vote the regulatory measure passed recently by Council at the solicitation of Street Railway Commissioner W. E. Cann. They will have until June 1 to secure their licenses and indemnity bonds. This was determined at a conference of city officials Saturday.

The bus men had organized and submitted a petition to the electorate, but when the 17,498 names were checked over by City Clerk Albert Payne it was found that not more than 4,575 were bona fide signatures. This lacked 2,084 of the legal number to bring a vote on the ordinance.

The ordinance is to be defied by the bus drivers, according to one of their attorneys. However, the city police department is ready to enforce the ordinance and the buses will be fined $100 to $500 for operating after June 1 without a license.

Jitney Fight in Birmingham

The fight over jitney regulation in Birmingham, Ala., will probably begin when H. P. Burruss introduces an ordinance drawn by the city attorney providing for a liability insurance amounting to $5,000. J. Weatherly, representing the jitney operators, will defend the present system.

The matter recently came to a head after an inspection of all the public utilities in Birmingham by the State Public Service Commission. The commission found that unrestricted jitney operation was taking too much revenue from the Birmingham Railway, Light & Power Company, the local company in Birmingham, and that another increase in fares was imminent unless something was done to relieve the financial distress of the company.

Associate Cooper's report follows in part.

> Relief from the disturbing conditions in the company's finances must come through readjustments which will give the company reasonable revenue without decreasing the service. It seems to me the solution of the problem must be in the regulation of those agencies in Birmingham which are now taking the short hauls from the company, the operators of automobiles for hire or the so-called jitneys. The commission found that operators of jitneys were obtaining the cream of the business on the short hauls, leaving the long hauls to the street railway. For instance, not many months ago the paving of Tuscaloosa Avenue in West End was completed. Since that time the revenue from the West End line of the street railway has shown a decrease of about 30 per cent. This decrease has resulted from the operation of jitneys on Tuscaloosa Avenue to the end of the pavement.

Dallas Denied Seven-Cent Fare

One of the last acts of the retiring city administration in Dallas, Tex., was to refuse to grant the application of the Dallas Railway for authority to increase its fares from 6 cents to 7 cents. The application had been pending for several months during which time the City Commission had conducted exhaustive investigation into the financial status of the traction company.

The commitments and promises made by the Strickland-Hobson interests in securing the present franchise in 1917 were also investigated and the traction company was shown to have failed to carry out all these promises. Lack of funds was pleaded as an excuse and this in turn was used to show the pressing need for additional revenue. The traction company has filed with the new city administration a motion for rehearing.

The action for a rehearing is taken under a provision of the recently enacted charter amendment which provides that any public utility must file motion for rehearing with the city commission before it is permitted to take an appeal to the Federal court. This action is believed to be preliminary to an appeal to the Federal court on the plea that the present fares in Dallas are confiscatory in that they do not permit an adequate return on invested capital. Traction company officials some time ago intimated that if the city refused to grant the increased fare the case would be taken directly to the Federal court in an effort to get needed relief.

The board of city comissioners in refusing the application for a 7-cent fare for the railway went on record as recommending to the new board of city commissioners that if it is shown that the traction company needs more revenue after the permission for the 6-cent fare expires on June 25 an extension of twelve months be made on the 6-cent fare agreement. When the railway company was given permission to inaugurate a 6-cent fare such permission was limited to one year, but the company was given authority to ask an extension of twelve months after the expiration of the year.

Jitneys a Menace in Indianapolis

H. O. Garman, chief engineer of the Public Service Commission of Indiana, in an address on May 20 declared that the jitneys are taking away from the Indianapolis Street Railway between $600 and $700 every day. He firmly believes that the jitney buses caused the decline in the revenue of the railway which necessitated an increase in fare. Mr. Garman brought out in his address the result of a recent informal conference between members of the commission and officials of the railway.

Evidence was submitted indicating that present rates are inadequate and that the company will face a deficit at the end of the year under present operating conditions.

Mr. Garman said it is his belief that the jitney should be eliminated. Perhaps the city officials who are opposing additional fare increases could refuse to permit the jitneys to operate over the streets.

Dr. Henry Jameson, chairman of the board of directors of the railway, when informed of Mr. Garman's statement, said:

> If the city is going to continue to have street car service it's got to do something on this jitney proposition, and do it pretty quick. I would not go so far as to say a return to 5-cent fares would follow immediately an order prohibiting operation of jitney buses. I do, however, believe such a decrease would result eventually. The company has been coming out on the red side of the ledger for the greater part of the last six months. We never have been able to show a satisfactory balance. Until we can show a surplus of between $200,000 and 300,000 we will be unable to obtain the extended credit necessary to provide improvements.

The present fare of 6 cents, with a 1-cent transfer charge and provision for the sale of twenty tickets for $1, has been continued by the commission until June 1.

Third Arbitrator Still Unselected

Charles Currie and Judge S. W. Crawford, representatives of the Northern Ohio Traction & Light Company, Akron, Ohio, and the unions respectively, have been unable to agree upon the selection of a third arbiter to settle the wage dispute now pending. It is likely that the third arbiter will have to be appointed.

Commission Bill Being Jammed Through

The bill before the Illinois Legislature which would abolish the present utilities commission and create the Illinois Commerce Commission with greatly reduced authority was passed by the house on May 25 by a vote of 100 to 23. It was jammed through as an administration measure, having been heralded as carrying out Governor Small's pre-election pledge. The bill will come before the senate during the week commencing May 30.

Transportation News Notes

Seven Cents Asked in Duluth.—The Duluth (Minn.) Street Railway has filed a request for an emergency fare of 7 cents or four rides for 25 cents with the State Railroad & Warehouse Commission. The request was filed in informal form only. Later papers setting forth in detail the financial needs of the company will be filed with the commission.

Railway Reduces Rate.—L. E. Myers, president of the Ironwood & Bessemer Railway & Light Company, Ironwood, Mich., announced that the fare would be reduced to 6 cents in Ironwood, effective May 9. The fare between Ironwood and Bessemer has been reduced 1 cent for each zone, making the new rate 18 cents instead of 21 cents. The reduction was made voluntarily by the company.

Asks to Run Bus Line.—The Springfield (Mo.) City Council has been petitioned by the Springfield Traction Company for permission to discontinue service on Center Street and to substitute bus service. The company states that modern auto buses would be procured and that a 5-cent fare would be charged with an additional 2 cents for a transfer to any other company line. The line is known as one of the short lines of the railway, and has been operated at a loss for some time. No action has been taken by the City Council.

Jitney Hearing Continued.—A hearing before the Board of Public Utility Commissioners of New Jersey took place on May 9 at Camden relative to licenses issued to jitney operators after March 15, which was the limit placed by the law when buses would be allowed to run on streets where there were trolley tracks, without the permission of the commission. The hearing will be continued, but tentative rulings were made relating to the operation of the Swedesboro and Blackwood buses. It is understood these buses will be allowed to operate provided they do not pick up and discharge passengers for rides wholly within the city limits.

Safety Islands for Columbus.—The Columbus Railway, Power & Light Company, Columbus, Ohio, may have "safety islands" for the benefit of pedestrians and car riders at High Street stops. The Columbus Automobile Club has asked Council for permission to construct the "islands." It is planned, if Council agrees, to construct "islands" at the two stops at Broad and High Streets, in the city's center, to test them out.

First Safety Contest Successful.——The first safety contest on the lines of the Southern Public Utilities Company in Charlotte, Winston-Salem and Greenville ended on Feb. 28 with the city of Charlotte making the best showing. A summary of the accidents shows that during the four months of the contest there were 97 accidents at Charlotte, 125 at Winston-Salem and 184 at Greenville. In all $1,635 prize money was awarded. The contest was so successful that the president of the company authorized the expenditure of $1,500 in a second contest which was scheduled to start April 1.

Needs Increased Rates.—The Ontario Government, owner of the Nipissing Central Railway, North Cobalt, Ont., recently applied to the Dominion Board of Railway Commissioners for an order authorizing a 25 per cent increase in passenger rates on this line. In the application it was stated that last year the net deficit on passenger traffic alone came to $21,024, while for the five months ended March 31 last the deficit reached $18,000. Several towns on the route opposed the increase. Assistant Chief Commissioner McLean suggested that the question of reducing service should precede the raising of fares.

Eight-Cent Fare Extended. — The Missouri Public Service Commission recently authorized the extension of the 8-cent fare in Kansas City for six months from April 8. In extending the present Kansas City carfare for another six months, the State Public Service Commission has issued a statement that the last four months indicate the company now has an annual net income slightly less than $1,000,000, while the company's indebtedness carries an interest charge of about $2,000,000, now in default.

Seeks Ten-Cent Rate.—The Southwest Missouri Railroad, operating in Jasper County, Missouri, and into the mining districts of Kansas and Oklahoma, has filed a petition with the Missouri Public Service Commission asking for an increase in passenger rates between Carthage and Joplin to 10 cents. The fare has hitherto been 1⅔ cents a mile. Much of the prosperity of the mining regions has departed, the petition recites, as the sharp drop in the price of lead has practically depopulated many of the towns. The company lost $8,212 in March, 1921, as the result of its operations between Carthage and Joplin.

Fare Raised to Seven Cents.—The State Public Utilities Commission has authorized the Nashville Railway & Light Company, Nashville, Tenn., to charge a straight 7-cent fare at Nashville in lieu of the four tickets for a quarter heretofore in vogue. Tickets will be issued five for 35 cents. The new rate was ordered for May 8. The utilities commission will retain jurisdiction of the case for such other and further orders as the conditions may warrant from time to time. Rates stand to be adjusted so as to give a return of not less than 6 per cent nor more than 7½ per cent on valuation as made several months ago.

Fare Increase Protested. — Through the instigation of a number of patrons of the Valley Railways, serving the Cumberland Valley in Pennsylvania from Harrisburg, an appeal will be made on the recent decision of the Public Service Commission allowing the railway to increase its fare from 7 to 8 cents. In all probability the Superior Court of the State will be asked to overrule the Public Service Commission on the ground that the increase is unjustified on account of decreasing cost of materials. This is the same ground cited by the commission in refusing the increase appeal of the Pennsylvania-Ohio Electric Company, operating in the city of New Castle, Pa.

Eight Cents in Helena.—The Montana Railroad & Public Service Commission has given permission to the Helena Light & Railway Company, Helena, Mont., to charge an 8-cent fare on its city lines. The East Helena fare will be 15 cents. The higher rate in the city will have a sixty-day trial beginning May 20. Provision has also been made for commutation tickets—forty for $2, to be used within 15 days. These will be issued in place of the present tickets, which are forty for $2.50, or 6¼ cents each. The company recently petitioned for a 10-cent fare, claiming that the award of the commission last July granting a 7-cent fare with a 6¼-cent ticket rate did not net a reasonable return.

Wants Increased Rates.—The Lynchburg Traction & Light Company, Lynchburg, Va., recently petitioned the State Corporation Commission for an increase in railway rates from 5 cents to 6 cents on both city and suburban lines. The company had asked for a 6-cent fare over all its lines and according to the franchise between the city and the traction company, the Council has permission to increase the rates. However, the City Council declined to grant the increase and accordingly the company petitioned for an 8-cent fare outside the city limits of Lynchburg. At a recent hearing befor the commissioners former Senator Aubrey E. Strode appeared for the County of Campbell protesting against the proposed increase. The commission adjourned the case until June 1, when further opposition will be heard. A digest of the valuation figures of the Lynchburg property was published in the ELECTRIC RAILWAY JOURNAL for May 14.

Petitions Council for Increased Rates.—The Buffalo & Lackawanna Traction Company, Buffalo, N. Y., has petitioned the City Council of Buffalo for a 10-cent fare and abandonment of the transfer exchange with the International Railway. The company leases to the Buffalo & Lake Erie Traction Company the right-of-way along the Hamburg turnpike to the city line at Lackawanna. Under the franchise provision was made for a 5-cent fare only with an interchange of transfers between Buffalo & Lake Erie and the International Railway. There has been no local service for more than a year, which fact will be used by the city as an argument against the traction company. Under a decision of the Court of Appeals the old commission lacked authority to raise the fares. The new commission can suspend franchise obligations. An appropriation of $5,000 was authorized to oppose the petition for increased rates.

New Publications

Maintenance of Way Cyclopedia

Compiled and edited by E. T. Howson, editor *Railway Maintenance Engineer;* E. R. Lewis, formerly chief engineer Duluth, South Shore & Atlantic Railroad, and K. E. Kellenberger, editor *Railway Signal Engineer*, assisted by Homer Hughes, formerly assistant field engineer Interstate Commerce Commission, in co-operation with a committee of the American Railway Engineering Association. Published by Simmons-Boardman Publishing Company, New York, N. Y.

As stated on its title page, this is a reference book covering definitions, descriptions, illustrations and methods of use of the materials, equipment and devices employed in the maintenance of the tracks, bridges, buildings, water stations, signals and other fixed properties of railways. The volume is composed of two general divisions, the illustrated text and the catalog section. More than 2,500 illustrations are employed, and the illustrated text is separated into sections corresponding to the several subdivisions of maintenance-of-way work, including tracks, bridges, buildings, water service, signals and wood preservation. There is also a general section including the devices commonly used in railway work. A directory is appended giving names of manufacturers of the products included in the cyclopedia. While the articles in the several sections are arranged alphabetically by titles, there is also a complete general subject index which will facilitate the use of the volume. In the space available here it is impracticable to review the contents of this valuable compilation, which will be useful in supplying definitions and reference information to electric railway engineers who are responsible for tracks, buildings, signals, etc.

Personal Mention

Mr. Sprague Honored Again

"Father of Electric Traction" Awarded Franklin Medal in Recognition of His Scientific Attainments

Frank Julian Sprague, who was awarded the Franklin Medal, with unanimous election to honorary membership, by the Franklin Institute on May 19, in addition to his pioneer work with the electric motor has had a hand in a large part of the electric railway development which has occurred in this country. A summary of his connection with several significant enterprises in this field, which has earned him the sobriquet of the "father of electric traction," was included in the address delivered on the occasion of the presentation of the medal and abstracted elsewhere in this issue.

FRANK J. SPRAGUE

Mr. Sprague was graduated from the United States Naval Academy in 1878, at the age of twenty-one. He was appointed to the Academy from Massachusetts, to which state he had moved in early youth. Five years after graduation he resigned from the Navy to join the technical staff of Thomas A. Edison, with whom his duties related principally to lighting matters, to which he made essential contributions. His main interest was even at this early date in the application of electricity to power purposes, both industrial and for traction, and within a year he had organized a company to carry on this work. His indomitable energy, as potent today as it was thirty-seven years ago, enabled him to overcome heart-breaking obstacles. His work developed logically along the lines, first of the application of new types of the electric motor to general industry, and then successively to the trolley, rapid transit and steam railway electrification. Meanwhile he developed an electrical system of elevator drive and control, the problems of which were analogous to those of traction. At present he is concentrating attention upon a system of speed control and automatic brake application on steam trains, to which he has given the past eight years.

During his vigorous career Mr. Sprague has been honored in many fields. He was awarded a gold medal at the Paris Exposition in 1889 and the grand prize of the Louisiana Purchase Exposition in 1904; and also in 1910, from the American Institute of Electrical Engineers, of which he is a past-president; the Edison medal "for meritorious achievement in electrical science, engineering and art, as exemplified in his contribution thereto." He is also past president of the American Institute of Consulting Engineers, the N. Y. Electrical Society and the Inventors' Guild, was a member of the Naval Consulting Board during the war and has acted as consultant on some of the most important electrification projects.

The Franklin medal, which is one of the highest world awards, is the second medal awarded to Mr. Sprague by the Franklin Institute, the former being the Elliott Cresson medal, which he received in 1904 for his development of the multiple-unit system of railway control. The Cresson medal recognizes "some discovery in the arts and sciences, or the invention or improvement of some useful machine, or some new process or combination of materials in manufactures, or ingenuity, skill or perfection in workmanship."

The Franklin Medal is awarded annually from a fund founded by Samuel Insull "to those workers in physical science or technology, without regard to country, whose efforts . . . have done most to advance a knowledge of physical science or its applications," and was given to Mr. Sprague "in recognition of his many and fundamentally important inventions and achievements in the field of electrical engineering, notably his contributions to the development of the electric motor and its application to industrial purposes, and in the art of electric traction, signally important in forming the basis of world-wide industries and promoting human welfare."

The meeting of the Institute on May 19 was a notable affair, attended by General John J. Pershing, who was made an honorary member of the organization; Ambassador Jules Jusserand of France, who accepted the same honor and the Franklin Medal on behalf of the distinguished French physicist, Professor Charles Fabry of the University of Paris, and many other celebrities. A paper by Professor Fabry was read by Professor J. S. Ames of Johns Hopkins University and Mr. Sprague gave an abstract of an extended paper on the history and prospects of electric traction.

Opens Consulting Office

S. H. Grauten, Who Redesigned Kansas City Railways Distribution Systems, Has Resigned

S. H. Grauten, electrical engineer and head of the research and consulting department of the Kansas City (Mo.) Railway, left the service of that company on April 15. Mr. Grauten has opened a consulting electrical engineering office in Kansas City. He has signed contracts to act as electrical engineer for the Kansas City Western, the Kansas City-Kaw Valley & Western, and the Pittsburg and Joplin Railways, and also for several other roads.

While with the Kansas City Railways Mr. Grauten had charge of the redesigning and construction of the entire distribution system, which included the rearrangement of substations and the installation of new ones. Some of these were automatics and were among the first to be installed in the United States. His duties included preparing the estimates, specifications, plans and contracts, and supervising the construction. In 1918 he was also responsible for the operation of the distribution system, involving power dispatching, substations and the transmission system. At the same time he was also engaged in an electrolysis investigation in connection with engineers of the United Gas Improvement Company and the research committee of the American Committee on Electrolysis.

S. H. GRAUTEN

An article appeared in the JOURNAL of Dec. 11 under Mr. Grauten's name in which he described the most recently completed substation, where there were incorporated several unusual features of building design and equipment.

Since his graduation from the University of Illinois in 1907 Mr. Grauten's experience has been wide. His first year out of school was spent at the Massachusetts Institute of Technology at Boston as an instructor. Following this he entered the electrical department of the New York Central in connection with the electrification of the Grand Central Terminal, where he acted as engineering assistant to the superintendent of power. After four years of this he went to the Panama Canal.

There he had charge of putting into service and making the tests of the entire electrical and mechanical equipment at the Gatun Locks hydro-electric plant and spillway. Mr. Grauten was in charge of the operation of the Gatun Locks from the passage of the first boat on Sept. 18, 1913, until the appointment of an army captain to that position in May, 1914.

MR. GRAUTEN VERY POPULAR

From September, 1914, to May, 1916, Mr. Grauten was with the Public Service Company of Northern Illinois, under J. L. Hecht, assistant to the president. He was employed on appraisal work and later on substation design, being in charge of this work during 1915-16.

Mr. Grauten was very popular with the organization at Kansas City and his leaving is a matter of regret to every one connected with the company. Although a highly technical engineer both by education and training, Mr. Grauten had the happy faculty of combining technical engineering with practical operation in a manner to secure the best results.

H. E. Blain, C. B. E., assistant manager of the London Electric Railway, sailed from England on May 25 for New York on the Olympic. He expects to remain in this country about six weeks, and will study recent developments in American traction systems.

Reinier Beeuwkes, chief electrical engineer of the Chicago, Milwaukee & St. Paul Railroad, who has recently been given a several months leave of absence, sailed from New York City on May 11 for Panama and South American ports.

Walter Jackson, consulting engineer, sailed May 24 for Europe on the *Aquitania* for a tour of the United Kingdom and the principal continental cities to make further first-hand studies of the latest developments in fares, transportation salesmanship, motor buses and trackless trolleys. He does not expect to return to the United States for several months.

Edgar Blessing, Danville, Ind., an attorney, has been appointed by Governor Warren T. McCray to membership on the Indiana Public Service Commission. He succeeds E. I. Lewis, who resigned to become a member of the Interstate Commerce Commission. Mr. Blessing, whose term will expire May 1, 1923, will assume his duties with the commission June 1.

L. H. Appel has been appointed assistant electrical superintendent of the Pacific Electric Railway. Mr. Appel first affiliated himself with the Pacific Electric Railway in June, 1912, under S. H. Anderson, electrical superintendent. He served in the capacity of operator, electrical inspector, estimator and power clerk. In December, 1915, he was advanced to the position of chief clerk to the electrical superintendent, in which capacity he served until April 1, 1921, when he was promoted to his present position.

Obituary

Col. J. F. Strickland

All Texas Mourns Death of Eminent Utility Promoter, Financier and Operator

Col. J. F. Strickland, president of the Dallas (Tex.) Railway, the Texas Electric Railway, and several other utility companies, recognized as one of the leading traction men of the entire country, died suddenly at his home in Dallas on May 21. Death was due to an attack of illness affecting the heart.

Colonel Strickland was 60 years old, and at the time of his death could look back from a position of power in the traction world over a path of remarkable successes that come to few men. Born in Alabama, he early in life decided to come to Texas, and borrowed money to make the trip. His first work was on a farm near Waxahachie, where he saved his money and soon had sufficient capital to enter the cotton ginning business at Avalon, a small village near Waxahachie. Later he engaged in the wholesale grocery business under the firm name of J. F. Strickland & Company. In 1897 Col. Strickland entered the utility field as manager of the Waxahachie Light & Power Company, in which position he continued until 1902 when he became associated with Judge M. B. Templeton, Dallas, now head of the legal department of the Strickland interests, and Ocie Goodwin, also an official of the Strickland companies.

COL. J. F. STRICKLAND

These three men conceived and carried through the idea of a central electric generating plant to supply current for a number of northern Texas cities out of which eventually grew the present great company known as the Texas Power & Light Company.

At this time the territory north of Dallas appealed to the three men as a field of large possibilities for interurban lines, and they began to lay plans for building interurbans which today are consolidated into the Texas Electric Railway, one of the longest interurban lines in the world. In 1904 the Texas Securities Company was organized to own the stocks and to finance the various projects which these men were planning.

In 1906 the preliminary work of constructing the interurban line from Dallas to Denison was begun and the Texas Traction Company was organized with Col. Strickland as president. It is generally conceded that it was due largely to the tenacity of purpose and broad vision of Col. Strickland that the money was procured to complete the line, which was put into operation on July 1, 1908.

The next large venture of Col. Strickland was the organization of the Texas Light & Power Company, under which organization electric current for lighting and power is supplied to more than 100 cities and towns of northern Texas and power for the operation of the interurban lines of the Strickland interests is generated.

Organization of the Southern Traction Company was the next big venture, and in 1912 the interurban lines from Dallas to Waco and Corsicana were completed and put in operation by this company. The Texas Traction Company and the Southern Traction Company were later consolidated into the Texas Electric Railway and the interurban line from Denison to Waco operated as a unit with through service from one of the lines to the other.

In 1916 Col. Strickland, at the request of the city officials of Dallas, undertook the work of developing franchises granted by the city of Dallas to the electric light company of the city. Service had been poor and unsatisfactory and the city officials turned to a man who they believed would be able to bring order out of chaos and give the city adequate service. The Dallas Power & Light Company, one of the most successful lighting and power companies of the entire state, attests the genius and ability of the man the city officials had chosen.

About this time the four street railways operating in Dallas were consolidated under the direction of C. W. Hobson of the General Electric Company. Just before the consolidation was effected Mr. Hobson discovered that he would be unable to take control of the lines as he had planned, and Col. Strickland was persuaded to take over the lines. The Dallas Railway was organized with Col. Strickland as president, under the so-called service-at-cost franchise granted in October, 1917.

Under the commitments made at the time the traction franchise was granted in 1917, Mr. Strickland was compelled to build two interurban lines each at least 30 miles long into the city of Dallas, and he recently organized a company to build an interurban line from Dallas to Terrell. Work on this line is now under way.

At the time of his death Col. Strickland was president of seven utility and allied companies in Dallas.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Lower Prices No Stimulant to Line Material Demand

Last Decrease of 6 to 9 per Cent the First of This Month Makes Third This Year

Price reductions on overhead copper line material have failed to stimulate buying to any degree as yet. The last reduction was made by producers around the first of this month, the decrease taking effect on April 29 in one instance and on May 5 in a couple of others. This decrease, which is the third since the first of the year, amounted to from 6 to 9 per cent and covered both bronze and malleable iron material. The discount allowed by one producer on a certain item in this field shows the trend of prices very well. The peak appears to have been reached about last July when in this one representative instance the discount went from 20 to 10 per cent. It remained there until January, 1921, when it went to 15 per cent, in February it increased to 20 and with this last price decrease goes to 25 per cent.

Buying continues to be for maintenance only, though a slight improvement recently in that respect is noted in one or two quarters. The general market remains quiet, however, with railways not endeavoring to stock ahead. Some consumers, it is stated, are still looking for lower prices, but on the other hand, a representative producer states that this last price decrease was made more in an attempt to induce buying rather than because of lower costs.

Stocks of standard finished products and semi-finished material in this field are good, with prompt deliveries prevailing. Some manufacturers are continuing production on a basis whereby demand is expected to increase materially later in the year.

Electrolytic copper is stronger again with producers quoting 13.37½ cents to 13.50 cents for spot, May and June delivery.

Lower Prices on Brass

Buying, Although Light, Is Better Than It Was in April

Reductions in brass prices of the order of 1 cent per pound were announced last week in manufacturing circles. Makers of schedule material expressed to the ELECTRIC RAILWAY JOURNAL their satisfaction in this reduction upon receipt of the new price lists. At present business in the brass field as related to electrical production is much below normal, but a leading producer of socket-shell material said last week that the May business had been considerably better than that of April. The chief demand just now is for copper products. Competition for business is very acute. Reductions in wages and salaries of the order of 10 per cent have lately been made in the brass industries, and some of the mills are running on half to two-thirds time. A 10,000-lb. order looks large today.

There has been no change in the price of copper products since April 18, according to a representative manufacturing establishment. The new base prices for brass in quantity lots as issued by a leading house are as follows: Sheet metal, high brass, 16¼ cents per pound; low brass, 17¾ cents. Wire, high brass, 14¼ cents; low brass, 18¾ cents. Rods, high brass, 14¼ cents; low brass, 18¾ cents. Brazed tubes, brass, 27½ cents. Seamless tubes, high brass, 20 cents; low brass, 21½ cents; copper, 22 cents.

Rail Mill Operation at Higher Capacity Than Other Steel Business

Sizable Orders for Both T and Girder Rails Placed Early This Year Keep Plants Fairly Busy — Present Buying Is Light Though Improvement Is Expected This Fall

Steam railroads have ordered steel rails this spring comparatively better than electric lines, according to reports received from producers. The tendency of electric traction companies has been to hold off buying and though there is undoubtedly a tremendous potential need for girder rails throughout the country, it has not resulted in heavy buying. The same is more or less true in the steam road field, only with this difference—steam railroads have ordered only for maintenance too, but their absolute repair needs have so accumulated that the tonnage placed has been considerable.

The standard T-rail business of mills at the present time is in much better shape than other classes of steel business. Around the first of the year sizable orders were placed, the buying coming early and largely at one time. The same is true of girder rail orders; a fair tonnage was placed early this year, and these orders are now keeping mills fairly busy. Unfortunately, however, at the present time there is hardly a thing in sight in the way of new business and when present orders on the books are filled it looks as if rail departments will be in the same condition as the other classes of the steel business.

Of course production even now is by no means at capacity and it is very possible that operation can be strung out until business improves. In fact, rail producers in several instances are counting upon this fall to develop good buying. By that time the all-important wage decision, which it seems will be in favor of the railroads, will have had time to make itself felt.

Foreign buying is flat for there is considerable competition offered by rail mills abroad whose output is greatly favored by prevailing exchange rates, and customers seem to be waiting for lower prices to develop here. In this connection a South American country has recently placed an order for more than 4,000 tons of steel rails with a German company at a price which American producers could not meet and at the same time the seller extended longer credit terms than Americans are accustomed to do.

The market for open-hearth rails in this country remains unchanged at a price of $47 per ton. Girder rail prices are not uniform at present but on a recent order for 100 tons of a 122-lb. grooved girder rail a price of about $65 per ton was made, while for 200 tons of a 140-lb. guard rail section the price was about $93.25 per ton. Labor costs are now considerably lower in this field, for with the wage cut of 15 per cent inaugurated by the U. S. Steel Corporation, all producers have reduced wages from 15 to 20 per cent and some of the independents have recently announced a second reduction. Shipments at the present time are prompt and in general average from 4 to 6 weeks.

Some Further Data on Raw Material Costs

Increases Over Pre-War Prices Appear to Be Still Above Those of Finished Products

Prices of raw material used by manufacturers in the electric railway field have of course receded within the past few months and discussion is frequently heard as to whether reductions in the cost of materials have not outstripped the decreases that have been passed on in the finished products. In this connection it is interesting to get a line on where material costs stand at the present time compared with prewar prices.

The table which is presented here gives the cost of certain materials purchased as late as May, 1921, compared with the middle of 1915, which materials go into the makeup of electric railway products.

	Increase, Per Cent
Pig iron	180
Steel plates	101
Copper	12
Steel castings	180
Coke	150
Mica	83
Asbestos insulation materials	395
Other insulation materials	156
Magnetic sheet steel	221

Turning to the status of present prices of several finished products compared with pre-war prices, an increase of 120 per cent is shown on car equipments; electric locomotives, 120 per cent; rotary converters, 117 per cent; switchboards, etc., 120 to 146 per cent, according to the labor content and materials used.

Reduction of prices, according to the same source of information as the above figures, will probably be gradual, depending upon decreases in labor cost throughout the country, declines in raw material cost and increased production. As long as production is low, opportunities for lowering prices, it is stated, are very limited. The problem confronting the average buyer is to determine the value and earning power of new equipment during the next six to ten months and compare this with a possible price reduction of 8 to 10 per cent that might be gained by holding off from buying for that length of time.

Interest Being Displayed in Steel Tower Market

Although Activity Is Not Pronounced, Utilities Are Keeping in Close Touch with Transmission Market

A survey of the foreign and domestic market for steel transmission towers reveals fairly uniform conditions among producers. Present activity at home and abroad is very light, there being little or no demand for this class of material as yet this year. Furthermore, there does not seem to be much prospect of greater buying developing later in the year, for customers are still holding off for lower prices and difficulty in financing new transmission projects continues to retard the market.

In view of the position of this market as a barometer in the electrical industry, however, it is gratifying to note that producers are generally quite optimistic over the future. At the present time several companies report that they are receiving a large number of inquiries both in the United States and from foreign countries. Actual orders, as stated heretofore, are not being placed, but at the same time the pulse of the market is being closely felt and interest on the part of central-station companies and electric railways is considerable. From all accounts it seems that there is a large potential demand being held in abeyance.

The average base price on galvanized material used in fabricating steel towers is now said to be about 7 cents. There does not seem to be much chance of further price decreases being made, it is stated, unless steel declines further. The extent of price reduction made by different producers varies somewhat, but in a representative instance prices have receded approximately 30 per cent from the peak reached about one year ago. This figure is based upon the cost of one particular job which was figured last spring and finally held over until this year.

Deliveries can be made promptly, for though the finished product is not stocked, steel mills are keen for business and fill orders in quick time. Some producers are also carrying good stocks of material ready for fabrication.

Railway Supplies for Ecuador

The National Tramway Company in Quito, Ecuador, is in the market for tramway materials, railway tools and equipment and hydro-electric plant supplies, according to the Guaranty Trust Company, New York.

Electrification of Railways in South Africa

Tenders will be received by the High Commissioner for the Union of South Africa, Trafalgar Square, London, Eng., or at the office of the general manager, Johannesburg, South Africa, until July 5 for equipment, switchgear and accessories, etc., in connection with the electrification of the Cape Town-Simonstown and the Durban-Pietermaritzburg railway lines. Specifications, etc., at the above offices. Further information on application to Merz & McLellan, consulting engineers, 32 Victoria Street, S. W., 1, London, Eng.

Bids for the Electrification of Santiago-Valparaiso Railway

Bids will be taken by Railway Council until June 30, 1921, for the electrification of the first zone of the railway running from Santiago to Valparaiso. The cost, including electric locomotives, is estimated at 40,000,000 pesos.

Rolling Stock

The Tiffin, Fostoria & Eastern Electric Railway Company, Tiffin, Ohio, has just placed an order with the Differential Steel Car Company for one new dump car.

The Southern Pacific Railway, according to J. A. Ormandy, assistant general passenger agent, will put 12 new cars in operation on the Portland (Ore.)-Corvallis line about July 15. The new cars will cost $37,000 each, about double what the ones now in operation cost the Southern Pacific.

Canadian National Railways, Toronto, Canada, is testing an electric storage battery car on its tracks between Trenton and Belleville. The car is operated by Edison batteries which it is said will drive it 140 miles on one charge. Maximum speed on level track is given as 40 m.p.h.

The Municipal Railway System, San Francisco, Cal., mentioned in the May 7 issue as completing arrangements for purchasing about 30 new cars, has issued the following information regarding these:

Number of cars ordered	20-30
Type	Center entrance; center exit
Seating capacity	32
Weight	26,200 lb.
Length over all	29 ft. 10 in.
Truck wheelbase	12 ft. 0 in.
Width over all	8 ft. 8$\frac{1}{2}$ in.
Height, rail to trolley base	10 ft. 2$\frac{5}{16}$ in.
Body	Semi-steel
Interior trim	Birch
Roof	Arch
Air brakes	Westinghouse
Axles	A. E. R. E. A. Standard E-4
Bumpers	Cast steel
Car signal system	Consolidated
Car trimmings	Bronze
Control	K 36 J R
Curtain fixtures	National Lock Washer Company
Curtain material	2-ply Fabrikoid
Designation signs	Hunter
Fare boxes	Johnson
Fenders or wheelguards	Eclipse
Gears and pinions	Helical
Hand brakes	Peacock Staffless
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters	None
Motors	2 Westinghouse 532A Inside Hung
Registers	None
Sanders	Air
Seats	Hale and Kilburn
Seating material	Rattan and 3-ply Veneer
Step treads	Mason Safety
Trolley catchers or retrievers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	Kalamazoo
Trucks	Brill Radiax E-1
Ventilators	Gartland
Wheels	26 in. Steel

Franchises

Walla Walla Valley Railway, Walla Walla, Wash.—The Walla Walla Valley Railway, through C. S. Walters, general manager, has made formal application for a franchise from the county commissioners for operation of a trolley line on East Alder Street and Pacific Avenue, from the city line to the natatorium. The franchise is sought from the county because the extension is beyond the city limits.

Tacoma Railway & Power Company, Tacoma, Wash. — Arrangements for street railway service into the North Stevens Street, or the College of Puget Sound district, are being completed, and the City Council has notified the state department of public works that the Council will grant the Tacoma Railway & Power Company a franchise to operate a car line on the proposed route of the Sixth Avenue extension, if the department grants the request of the citizens that the company be directed to give them service. The route to be followed has been agreed upon by the various interests involved.

Recent Incorporations

Abilene (Tex.) Traction Company.—The Abilene Traction Company has been chartered with a capital stock of $100,000. It will take over the property of the old traction company which failed and which has not been operated for two years or more. The incorporators are J. N. Burjacs, Price Campbell and G. W. Fry.

Track and Roadway

Miami Beach Electric Company, Miami, Fla.—Permits have been secured from the county commissioners for four turnouts on the Miami-Miami Beach electric line, and J. H. McDuffee, treasurer of the Miami Beach Electric Company, announces rolling stock has been ordered along with material for the sidings, preparatory to making the service between Miami and the beach a ten-minute schedule instead of twenty minutes as at present.

Indianapolis (Ind.) Street Railway.—The placing of new special work in car tracks in Indianapolis at Illinois and Thirty-fourth Street, which will make possible the routing of Mapleton cars over Illinois Street, instead of Central Avenue, and also the operation of a crosstown line in Thirty-fourth Street, will start June 15 and be rushed to completion, officers of the Indianapolis Street Railway Company told the board of public works on May 12. The company reported that considerable progress has been made in the rebuilding of the tracks in West Washington Street, from Belmont to Harris Avenue. As soon as this work is done the company will start the rebuilding of the tracks in Delaware Street from Massachusetts Avenue to Washington Street.

Detroit, Mich.—The Department of Street Railways, City of Detroit, expects to build 82 miles of single track this summer, with International steel twin ties and 93-lb. and 100-lb. T rail with concrete foundation. The overhead will call for tubular steel poles in the central district, cedar poles in the outlying districts, feeder cable, 2/0 trolley wire, hangers, gears, span wire, strain insulators, various pole line hardware, etc.

Detroit (Mich.) United Railway.—The Detroit United Railway has received the approbation of the Flint Common Council in the matter of temporary construction for the line on Bray Avenue from Saginaw Street to Flint Lake Park. Owing to the expense of new material the company will use old rails and other materials on hand. This construction is permitted for a period of five years.

Southern Public Utilities Company, Charlotte, N. C.—Large track building and paving will be started soon by the Southern Public Utilities Company in Winston-Salem. The tracks on Liberty Street will be relaid for a distance of approximately one mile.

Power Houses, Shops and Buildings

Central Maine Power Company, Augusta, Me.—The Central Maine Power Company will build a new substation in Augusta at the corner of Bangor and Lock Streets. The new building will be of tapestry brick with a roof of green tile. The change in location has given the company an opportunity to improve its local service by the addition of modern bus structures, new transformers and new wiring.

Detroit, Mich.—The Department of Street Railways, City of Detroit, has practically completed plans for the construction of a new office building, a carhouse and outside storage for 200 cars, and a shop building capable of handling 500 cars. It is planned to construct these buildings this summer so that they will be ready for use by Sept. 1, at about which time 100 new safety cars are expected to be delivered from the manufacturers.

United Railways, St. Louis, Mo.—Contracts will be let in the next few weeks for a new substation and car house for the United Railways to take the place of an obsolete station on the North Side. The new buildings will cost approximately $250,000. The management is completing the installation of two small automatic substations on St. Louis county lines, one a Westinghouse and the other a General Electric of 300 kw. capacity each. For the conversion of additional power needed on city lines four or five additional automatic stations aggregating 8,000 kw. capacity will be installed the latter part of the year, according to the plans of Col. A. T. Perkins, manager for the receiver. The two small stations, which cost approximately $26,000 each, will be in service in a few weeks.

Professional Note

Ford, Bacon & Davis announce the opening of a Philadelphia office in the Morris Building, 1421 Chestnut Street. H. V. Coes will act as manager.

Trade Notes

Dahlstrom Metallic Door Company, Jamestown, N. J., has moved its New York City office from the Consolidated Gas Building, to suite 832, Cunard Building, 25 Brodway. The company reports business generally good throughout the country, but especially in the New York and Atlantic Coast district.

The Rome Wire Company, Rome, N. Y., has opened district offices at 50 Church Street, New York City, in line with the company's expansion of manufacturing facilities at Rome and at Buffalo, N. Y. The new office will be in charge of R. S. Hammond who has represented the company in the eastern territory during the last twenty years.

Raymond Roth has located at 30 Church Street, New York City, where he has opened a district sales engineering office, covering the central Atlantic district, representing Schweitzer & Conrad on switching and protection equipment, the G. & W. Electric Specialty Company for distribution specialties, the Hopewell Insulation & Manufacturing Company, and the MacGillis & Gibbs Company on cedar posts, poles and ties.

E. Jacobus Orange N. J. announces that after the introduction of the Jacobus vacuum lightning arresters on railroads of the United States it has been decided to prosecute the sale of this apparatus most extensively throughout the United States and Canada. Consequently the entire sale has been placed in the hands of the Multiple Electric Products Company, Inc., 450 Fourth Avenue, New York City, manufacturer of "Atlas" multiple fuses, through the offices and sales organization of which both this country and Canada will be covered.

"Ingeniería Internacional" Issues New Foreign Trade Bulletin.—*Ingeniería Internacional*, published by the McGraw-Hill Company, Inc., at Tenth Avenue and Thirty-sixth Street, New York, has issued Volume 1, Number 1, of "International Engineering," a foreign trade bulletin. Printed in English, its function and purpose are to show how American manufacturers may cement sound economic and commercial relations with the great potential market in the Spanish-reading countries and to explain and interpret the work of *Ingeniería Internacional* in forwarding these purposes.

New Advertising Literature

Electric Hoists. — The Allis - Chalmers Manufacturing Company, Milwaukee, has issued bulletin No. 1819, covering its electric hoists.

Controllers. — General Electric Company, Schenectady, N. Y., has issued bulletin No. 44678-A describing the various kinds of drum-type controllers for railway service.

Switch Box.—The Multiple Electric Products Company, 450 Fourth Avenue, New York City, has developed a switch box for lighting circuits where exposed molding or conduit wiring is employed.

Excavators.—The new P. & H. shovel attachment for use with P. & H. types 205 and 206 excavator cranes is described in Pamphlet SX just published by the Pawling & Harnischfeger Company, Milwaukee.

Oil Circuit Breaker—Type F-10 oil circuit breaker, with an interrupting capacity of 10,000 amp. per phase at 15,000 volts, has been put on the market by the Condit Electrical Manufacturing Company, South Boston 27, Mass.

Power Plant Piping. — The M. W. Kellogg Company, 90 West Street, New York City, has issued a 130-page illustrated catalog on power plant piping, embodying numerous tables.

Oil Circuit Breaker.—The Condit Electrical Manufacturing Company, South Boston 27, Mass., has placed on the market its type D-17 oil circuit breaker with resiliently suspended tanks in single units up to 1,200 amp. at 15,000 volts and up to 800 amp. at 25,000 volts.

Steel Sheet Piling.—Lackawana Steel Company, Buffalo, N. Y., has issued bulletin No. 109, containing 171 pages describing steel sheet piling.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, June 4, 1921 *Number* 23

More Business in Government, Less Government in Business

THIS idea, which was adopted as a text by the United States Chamber of Commerce at its meeting last month, seems also to be the guiding policy of the present national administration. A desire to secure help from industry in the work it has to do and to undertake by government action nothing which can be carried on more effectively by private initiative has already been expressed by the Secretary of Commerce. Another significant declaration bearing upon the same matter was contained in addresses made at a banquet in New York last week in honor of the founding of the New York *Commercial*, attended by the President and the Secretaries of War, Commerce and the Interior. The occasion, the 125th anniversary of the founding of an important business paper, was an appropriate one in which to outline the essential correlation between business prosperity and national prosperity. This thought was voiced by the President, who held that the business man should not be prejudged as a criminal, but recognized as an important factor in national prosperity. The close connection of the business press with industry was also recognized in the address of the President, as well as in that of Mr. Hoover. This position on the part of the national government is most encouraging, especially at the present time when there is so much unemployment and stagnation in business. With such a sentiment. there should be a revival of industry.

Get the Young Engineer While the Getting Is Good

ELSEWHERE in this issue is a graphic portrayal of the value of a capable man in charge of rolling stock. If similar data for other departments of a railway could be portrayed as graphically, the results would doubtless be just as striking. Such men are of inestimable worth to a company, and more young men of the necessary ability should be in training as future master mechanics, superintendents of equipment, transportation engineers, power or track engineers, superintendents and general managers.

This month the engineering schools of the country send forth a large number of potential civil, electrical and mechanical engineers—young men with good fundamental training and most of them with plenty of ambition and energy. Some of these future leaders should be encouraged to come to the electric railways, where every one knows they can find plenty to do. The trouble is—the reason they do not come is—first, that no one goes after them: there is no organized and very little individual effort to induce young men to come to electric railways, and, second, that when they do come it is in only a few cases that the railway actually makes it worth while, opens up the right opportunities to them. Not that they should start at the top! By all means the opposite should be the case. But the opportunities ahead should be made clear and the positions which they may ultimately attain made sufficiently attractive as to financial status and responsibility.

The continued development of organized methods to absorb young engineers into other engineering industries should be sufficient indication of the value of such effort. The electric railway has been slow in this line. But the present is a good time to change. There is a new crop of young engineers. Some of the industries which usually absorb many from the annual production are operating on a restricted basis and will not take the usual number this year. Electric railways can normally use more men in summer time. Why not make a study to see where young engineers could be used to advantage and get them now that the getting is good?

Jitneys Regulated in Their Last Strongholds

LOCAL legislation in Kansas City, Mo., and state legislation in New Jersey and Connecticut give prospect of doing much to bring jitney competition within reasonable bounds in these places. The quarrel of the railways with the jitneys has never been with these vehicles as such, but with them on the score of their unreasoning and unreasonable competition on anything like a comparable basis. The jitneys have continued in use in the places mentioned long after similar vehicles were banished elsewhere, from a combination of circumstances, but mostly because of political chicanery. In Kansas City they have now been relegated to operation on streets where there are no railways, while in both New Jersey and Connecticut prospective operators of the jitneys must obtain from the local state commission a certificate of convenience and necessity before being permitted to operate. In neither of the states mentioned has the new law yet begun to function, so no precedents have been established as to the attitude of the local bodies with respect to regulation, but the commissions have set to work to organize the machinery therefor. In Connecticut, for instance, the commission has called upon the local governing authorities to indicate routes for the jitneys, thus preserving a measure of home rule.

In Kansas City the lessons of the benefits of the new legislation are fast being driven home. The receivers of the Kansas City Railways, true to their promise, have placed about 10 per cent more cars in operation. This service would have been provided before except that under jitney competition there was not enough traffic to pay for keeping the cars on the streets. These additional cars have had a salutary effect, with the result that in the month of operation under the ordinance the public view has changed to a marked extent. The bitter enders will of course stick to the jitney to the end. That is their prerogative. But the real place of the jitney as a service supplementary to the trolley instead of being competitive with it appears now to have been firmly established in the public mind in Kansas City.

From "Interurban" to "Electric Railroad"

REFERENCE is often made to the name "interurban" as being an onus—a word too easily made over in common parlance into "inter-ruben" and carrying a meaning not altogether complimentary. Some have suggested that an effort be made to rename the interurbans "electric railroads," on the supposition that this would lift them to a higher plane of public esteem. This may help, but cannot alone do the trick, for an interurban by any other name would still be subject to criticism—if criticism was deserved. But there is one way in which the desired end may be attained, and that is by such improvements in cars, roadbed and service as will earn for the property the reputation of being a real railroad.

An evolution of this kind has been witnessed on the Chicago-Milwaukee line operated by Britton I. Budd, whose effort has been persistently directed toward making the service of this road comparable with the high-grade steam road service with which he competes. He has very nearly attained that goal, with the result that the traffic handled has increased enormously, and the remark is now frequently heard, "It's a real railroad." The word "interurban" doesn't seem to apply any more. At one time, like many other electric lines, it was better characterized as an extended street car line, but it has won the more desired term of railroad because it is one. A similar evolution is now well under way on the Indianapolis-Louisville line under the direction of Harry Reid, and the policy being pursued promises to bring much new business and win for it the favorable public attitude sought. Some of the improvements made and in the making on this line are reviewed elsewhere in this issue. Without such actual physical evolution in an interurban property there can be little accomplished by an effort merely to change the term of reference.

Repair Versus Replacement in the Rolling Stock Department

ONE effect of the erstwhile "hard-up" condition of the electric railways has been a campaign of rolling stock rehabilitation. Superannuated bodies and trucks have been scrutinized to determine whether a year or two more of service could be squeezed from them. Cars which were awaiting only financial amortization before destruction have been furbished up and recommissioned. In ordinary times the economy of much of this work would be questionable. In the hard times which have recently been passed through economics gave way for the time to bitter necessity. This was marking time, as was pointed out editorially in the May 21 issue of this paper, but marking time has its place in transportation as well as military practice provided it is not continued too long. Marking time produces no speed toward progress, it simply keeps the army in step, or, in electrical phraseology, in synchronism.

There will always be an excuse or a reason for revamping some rolling stock, particularly to adapt it to changed transportation requirements. But the wholesale continuation of this practice will soon cease. In other words the era of repair will give place to the era of replacement. The former has, however, brought out clearly the excellent qualities of much of the work of the builders of many years ago. Thus, in last week's issue was an article telling of work done by the New York State Railways on some motor cars and trailers. The cars of one batch were originally open bench summer cars. These were made over into closed motor cars some years ago and have now been remade over into center-entrance trailers. The fact that they would stand all of this, even allowing for the reinforcing which necessarily accompanied the remodeling, shows that they originally had good stuff in them, well fabricated and finished.

Fare Changes and Conductors' Morale

CONDITIONS on a certain railway which will be unnamed prove again that when a change in fare becomes necessary, failure to adopt a system that commends itself as just to the average layman is as bad for platform morale as it is for public relations. On this particular property the change in fare was an increase and the line was divided into equal-length fare zones, while the line itself operates in and between several practically contiguous cities. To cross the dividing line means the payment of a second fare whether the passenger boards the car ½ mile or 3 miles back or whether he is riding another fraction of a mile or several miles more. To make the matter worse several of the zone limits occur at points where there is naturally considerable short distance riding from one side to the other of the selected zone line. The obvious result has been the dissatisfaction of a great many riders who are expected to pay double fare for a distance that may be less than many people obtain for a single fare. Of course, the grumblers vent their grievances on the company representative nearest at hand—the unhappy conductor. Day in and day out he is greeted with such ire-provoking expressions as: "What kind of a railway is this, anyway?" "Why didn't you yell out that it meant another fare to ride another block?" and so on to the point of fisticuffs.

Such conditions as this mean something more than loss of traffic. They are sure disrupters of the conductor's morale and of his confidence in the management. Neither efficient fare collection nor enthusiastic ride selling is to be expected when the company has adopted—or some commission has compelled it to adopt—what looks like the easiest way of devising a multi-fare system. Would it not have been better to have a system of zones that would seem a little more logical to the car rider, *i.e.*, with zone points at natural traffic division points? It is not necessary that the zones should be of equal length provided the average rates per mile do not differ greatly and the total fare for the entire ride is reasonable. Such a plan would permit the zone limits to be placed at points where the greatest number of car riders would not be asked to pay an extra 6 cents or 10 cents for a ride of a few blocks and would largely do away with any considerable agitation for overlaps or lower fares.

On the selection of its zone points a company can usually get good advice from its conductors. They are the ones brought into closest contact with the company's customers, and they know the way in which any fare plan is likely to be regarded by those who pay fares. In fact it is a good rule in any kind of business that a merchant must convince his salesmen that the goods they have to sell are worth the price and that the sales conditions are fair before he can be very successful in bringing the customer to this belief. This rule should apply in electric railroading.

Blighted Districts and City Planning

AMONG the interesting features of the report made by the St. Louis Planning Commission on a transit system—present and future—for that city is the discussion on blighted districts, or those areas of low assessed values which exist in most cities between the business district and the more popular residential districts. From many standpoints it would seem most desirable if the blight on these districts could be removed. To the municipality they mean sections of the city from which the tax yield must be low; to the electric railway they mean the operation through them of relatively unprofitable car-miles to carry the passengers to and from the outer districts, while to the property owner these deteriorated districts obviously represent a direct monetary loss. With regard to such areas in St. Louis, Harland Bartholomew, engineer of the commission, says.

"Hauls of 5 or 6 miles are not the exception but more nearly the rule. Even the haul would not be so objectionable were it not for the fact that nearly half of it is through sections of the city which have constantly deteriorated in usefulness and from the standpoint of transit are almost entirely unremunerative."

To some people the cause of the blight which has fallen upon these ill-fated districts, lying between the business and high-class residential sections of the city, is the unit fare. If a lower fare were charged for the shorter ride to them as compared with a higher fare for the longer ride to the outer and more favored regions, they say, the salvation of these districts would be secure. The owners of the buildings then would be encouraged to tear down their old-fashioned houses and erect better structures in their place to accommodate the tenants to whom a difference of a few cents in fare per ride would be an object.

It is not well to dogmatize about such matters from appearances, but the blighting of a city district has so many possible causes that it is usually unwise to say that it is due to any single factor or that in any particular case it could be corrected by such a simple plan. It is more probable that even with a zone system the same conditions would prevail to very much the same extent and that the causes lie deeper than simply the rate of fare.

In fact, in the usual rapidly developing American city there are almost bound to be certain areas surrounding the business district which are changing in character from residential to commercial. Usually the history of these districts, or a good part of them, is about as follows: At one time they constituted a first-class residential neighborhood on the fringe of the city as it then existed. As the commercial area expanded, trade gradually pushed its insidious way in among the mansions. First perhaps came the dentist, then the apothecary's or milliner's shop was opened, to be followed by the high-grade grocery store. Gradually the more exclusive or prosperous residents moved outward and the former mansions became boarding houses, then possibly tenements. In all of these cases the trolley fare was probably not the controlling factor. The ultimate hope of such a district is not that its high-grade residential character will be revived—that is probably hopeless—but that it relatively will come nearer the business district and finally become part of it. Then the old buildings will give place to modern office structures, stores or warehouses, the assessable value will again increase and the owner will be happy.

The only effects which the development of electric railways and rapid transit systems can have on this natural condition are to hasten the change and to direct it along certain routes. This hastening may be first in the retrograde character mentioned and then in the renaissance of the property as regards value. In Brooklyn, for example, Fourth Avenue has already been improved in many spots because of the building of the subway. In fact, both offices and stores will be apt to follow along a rapid transit line, like a vine, leaving between the arteries of trade triangular areas of a residential character. Neither the owners nor the city should worry unduly about these fluctuations in real estate value. The "blighted" period is very apt to form the chrysalis stage of development, to which city real estate is subject.

Electric Railway Engineers Constitute a Large Fraternity

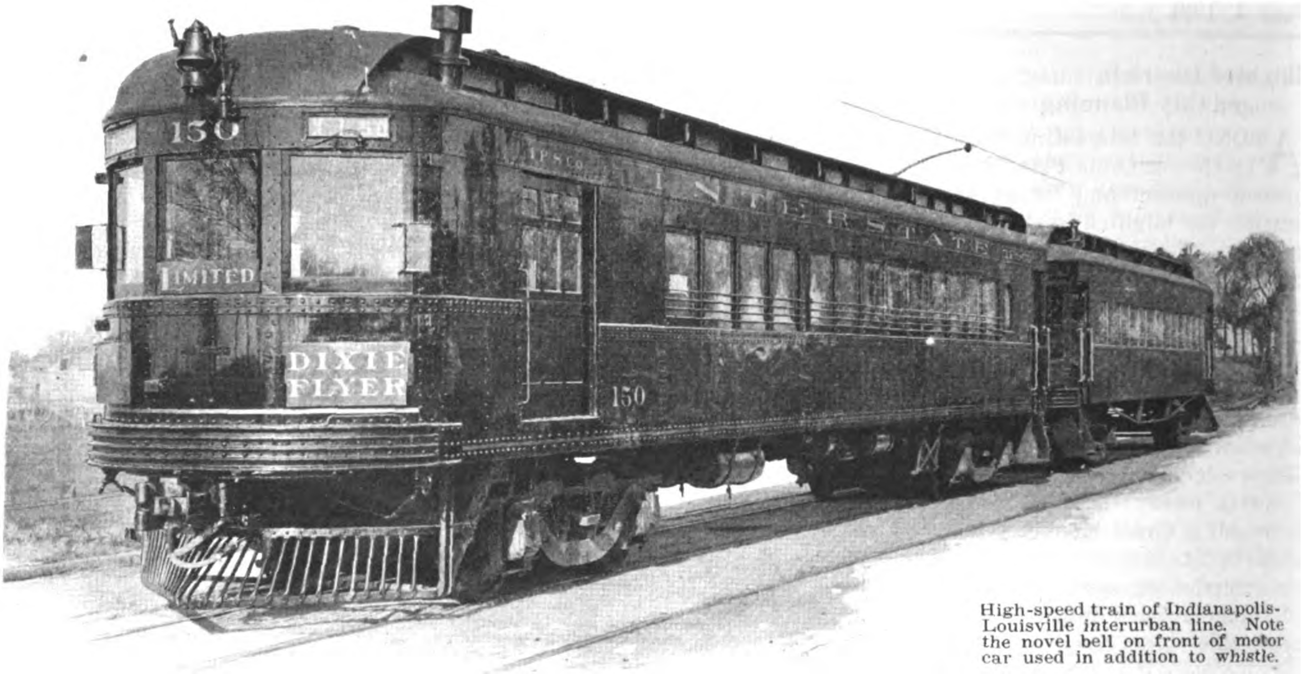
COMMITTEE activity in the American Electric Railway Engineering Association is now at its height. The meetings are being well attended and a fine spirit is manifest. One of the most impressive signs of efficiency in this committee work is the spirit of good fellowship that marks all of the gatherings of committeemen. This fact impresses one with the value of such meetings from the human standpoint, which in itself would justify the time and expense involved in getting together.

For the benefit of the technical development of electric railway work it is necessary that the responsible engineers be furnished ample opportunity to meet at these committee sessions and at the conventions of the Engineering Association, otherwise they are apt to be provincial and academic. The large attendance at committee meetings shows that this truism is appreciated. The helpful personal relations which are established thus are maintained between them by correspondence, chance or planned visits, the reading of "personal" items in the electric railway press, etc. There has thus been built up in the electric railway industry a national, although informal, engineering fraternity, membership in which should be highly prized. Every such opportunity should be embraced to foster the spirit of brotherhood that the electric railway engineer is privileged to enjoy.

Quotation from the Federal Electric Railways Commission Report

No. 23

GENERALLY speaking, this (introduction of economics of operation) can be done by the elimination of deadheads and other free service, the abandonment of non-profitable lines and, where practicable, the substitution of one-man cars for heavier equipment, the modification of special taxes or provisions for paving, snow removal, street closing, tolls, contributions toward the cost of public highways, bridges, etc., reduction of such rentals and power rates as may on investigation prove excessive, the co-operation with the public in developing faster schedules and installing skip stops at convenient places, rerouting of cars, the use of trail cars, keeping street car tracks clear of traffic and other congestion, due to parking of motor cars on curbs, and the regulation of vehicular traffic.


High-speed train of Indianapolis-Louisville interurban line. Note the novel bell on front of motor car used in addition to whistle.

Developing an Electric Railroad

Indianapolis-Louisville Interurban Is Undergoing Extensive Rehabilitation and Improvement—Features of New Steel Motor Cars and Rebuilt Trailers for Use in High-Speed Limited Service Are Described—Other Improvements to Be Related in Articles to Follow

NOTWITHSTANDING high prices and other adverse economic conditions, the Interstate Public Service Company, Indianapolis, Ind., under the direction of Harry Reid, president, has been extensively improving its 117-mile Indianapolis-Louisville interurban property and service during the past two years. The betterment work has followed along a plan designed to develop a railroad capable of rendering a high character of passenger and freight service between these two important terminal cities. While all details of the plan have not yet been fully realized, the physical improvements already accomplished, coupled with the evident disposition of the operating officials to give the public the kind of service it wants, have had a marked effect in attracting patronage to the road. This is reflected in the accompanying tables showing the recent growth in freight and passenger traffic.

The major betterments already carried out include the purchase of the Louisville & Northern Railway & Lighting Company and the Louisville & Southern Indiana Traction Company and the merger of them with the Interstate company; the purchase of new motor cars, the building of trailers and the inauguration of a new faster through limited service between Indianapolis and Louisville; the purchase of locomotives and new freight box cars and the inauguration of new through over-night freight service; the change-over of the 62-mile mid-section of the road from 1,200 volts to 600 volts to conform to the remainder of the system; abandonment of old 25-cycle transforming equipment and the installation of new 60-cycle substation equipment; the reconstruction of the old transmission line for higher voltage, the building of 54 miles of new transmission line and the dismantling of two obsolete power houses with arrangements for purchase of power, and a large amount of work on overhead and distribution systems and on the track and roadbed. Among the further improvements planned for the immediate future are the building of new shops, on which work has recently begun; the probable purchase of necessary equipment and inauguration of a parlor car and dining car service with possible sleeping car service; the installation of further automatic substation equipment, etc.

Perhaps of greatest interest at the moment are the

PASSENGER EARNINGS, INTERSTATE PUBLIC SERVICE COMPANY AND INDIANAPOLIS & LOUISVILLE TRACTION RAILWAY

	1919	1920	1921
January	$89,585.70	$116,207.21	$131,814.43
February	84,807.51	111,489.29	119,405.38
March	95,465.18	124,092.35	136,289.42
April	94,785 72	127,294.56	....
May	104,089.51	134,507.01	....
June	101,370.90	128,922.31	....
July	116,066.87	141,092.27	....
August	136,278.37	149,082.99	....
September	130 318.67	146,569 34	....
October	125,267.12	139,529.14	....
November	120,003.21	132,008.51	....
December	121,362.82	138,512.29	....

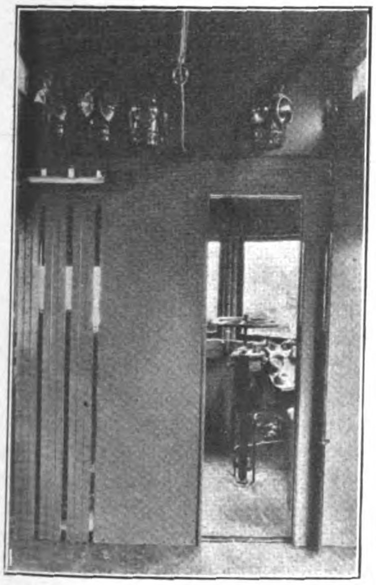
The operation of the Indianapolis & Louisville Traction Railway was taken over by the Interstate company in July, 1919. These figures include the entire line, Indianapolis to Louisville, Ky.

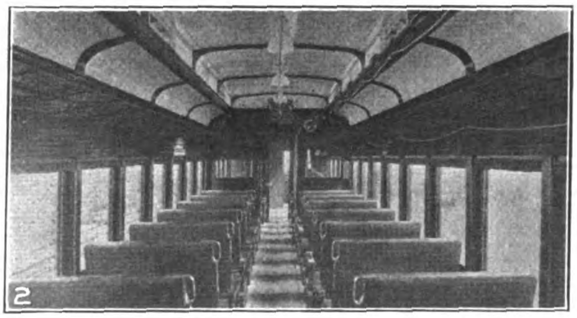
FREIGHT EARNINGS, INTERSTATE PUBLIC SERVICE COMPANY AND INDIANAPOLIS & LOUISVILLE TRACTION RAILWAY

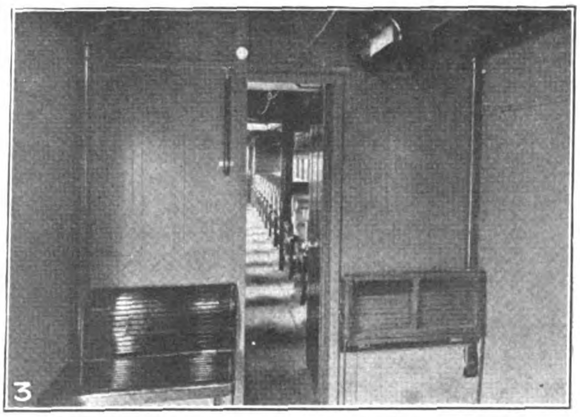
	1919	1920	1921
January	$7,029.47	$13,349.00	$14,378.70
February	7,406.60	15,617.19	16,146.92
March	9,235.31	20,362.71	21,024 46
April	....	22,275.37	....
May	10,203.83	23,127.48	....
June	12,159.24	28,886.62	....
July	12,428.94	23,949.87	....
August	17,031.42	21,571.49	....
September	19,088.46	27,598.62	....
October	17,666.28	24,800.50	....
November	14,741.09	20,556.98	....
December	12,395.49	16,085.10	....

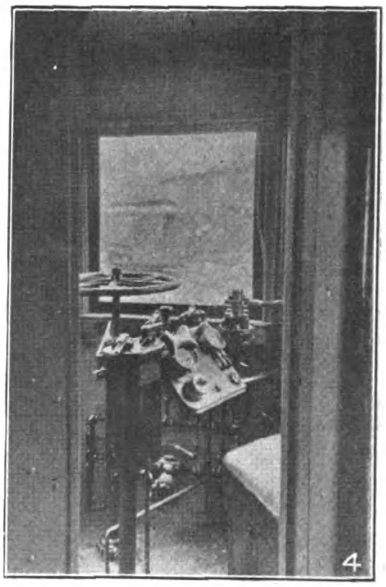
The operation of the Indianapolis & Louisville Traction Railway was taken over by the Interstate company in July, 1919. These figures include the entire line, Indianapolis to Louisville, Ky.

new rolling stock and the plans of the equipment department for a new shop at Scottsburg, Ind. In the last two years the rolling stock purchases have included twenty new box cars, a 37½-ton and a 25-ton locomotive and eight new steel passenger cars. Because of the great amount of time and design talent applied, these passenger cars are of particular interest. They are quite fully pictured in the accompanying views.









THESE VIEWS ARE OF THE INTERIOR OF THE MOTOR CAR

No. 1—Motorman's cab partition showing open construction and heater location.

No. 2—Looking forward from rear of main passenger compartment showing interior finish—aisle mats not in place.

No. 3—Rear of baggage compartment showing folding seats, city fare register location, etc.

No. 4—Convenient mounting of instruments and controls in operating cab.

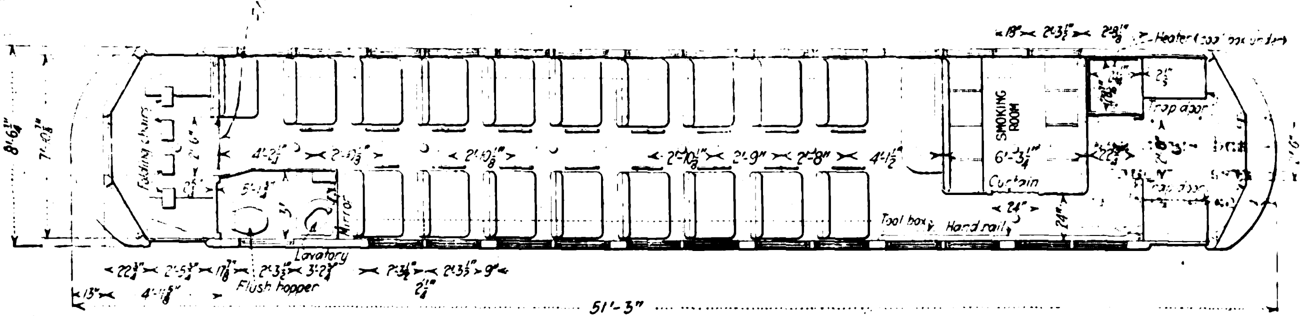
In general, these cars are of steel construction with a composite superstructure and monitor deck roof, with the interior arranged in passenger, smoker and baggage compartments. They are 62 ft. long over bumpers, seat sixty passengers and weigh 95,500 lb. They are equipped with special Baldwin trucks, having 7-ft. wheelbases and placed at 39-ft. centers. These trucks are equipped with 36-in. rolled steel wheels and 5-in. x 9-in. journals and Stucki self-centering and positive-rolling side bearings. The body side bearing is made with a removable wearing plate. The spring design on the trucks is such as to preserve good riding qualities through a wide range of live load. This is obtained by the use of an auxiliary set of bolster springs which do not come into bearing until the load has exceeded a certain amount, a feature developed for the last cars bought by the Chicago, North Shore & Milwaukee Railroad. Adequate spring support for a heavy load is thus secured without making the car ride stiff under light load conditions.

The further major equipment of these cars comprises four G.E.-254, 150-hp. motors with automatic field tap control and General Electric type PC multiple-unit control arranged for single-end operation. Westinghouse 38-ft. type D-3-EG compressor and type J governor are used. The couplers are of the Tomlinson MCB radial type, conforming with the C.E.R.A. standard.

The main support of the steel underframe is derived from the two side sills and two center sills. The side sills consist of 5-in. 6½-lb. channels extending from the buffer beam at the front end to the corner post at the rear end. The center sills consist of two 7-in. 15-lb. I-beams extending from front to rear buffer and reinforced with continuous pressed-steel section ⅜ in. thick extending from back of the bolsters to near the ends. Certain features of the underframe and vestibule steel work provide an anti-telescoping construction. The bolsters are of the built-up type consisting of plates and rolled sections which are fastened to the center and side sills.

The floor beams consist of 5-in. 6½-lb. channels extending from side sill to side sill and riveted to the horizontal flange of the side sills and to the side posts. The end sills consist of 6-in. 8-lb. channels supplied with 12-in. x ¼-in. top and bottom cover plates extending from side sill to side sill. No diagonal bracing was provided in the underframe, except for those braces in the platform construction which extend from each corner of the platform to the near center sill. The entire underframe is covered over with steel plates which tie all the members together, giving a certain amount of diagonal bracing and serving to fireproof the floor from the equipment. The buffers were made from 10-in. 15-lb. channels applied with the flanges outward and bent so that the radius of the outside flange is 5 ft. A 5½-in. Rico heavy-weight anti-climber section extending the full width of the car was secured to the web of these buffer-beam channels.

The side sheets, consisting of No. 12 gage steel and extending from the bottom of the side sills to the belt rail, with No. 14 gage steel above, are riveted to sill, belt rail and posts. This side-sheet construction is strengthened by a 4-in. x ½-in. bar riveted to the side sheet and extending from one end of the car to the other to form the belt rail. There is also the further



FLOOR PLAN OF NEW INTERSTATE PASSENGER CARS

strengthening afforded by a 3-in. x 3-in. x ¼-in. angle extending from end to end of the car body.

The side posts are made up of 3-in. x 2-in. x ¼-in. Tees sandwiched in between two sections of oak posts and covered with two pressed steel sections and a cover plate riveted over the joint, giving the appearance of a metal post. Each post is welded to the belt rail and side sill. Every third carline is of T-iron and wood composite construction, while the two intervening carlines are of wood.

The interior of the car is finished in cherry, stained mahogany, and the Agasote head lining is painted white, giving a pleasing and bright interior appearance. Center lighting is supplied by two circuits of 94-watt lamps. The fabrikoid covered seats were furnished by Heywood Brothers & Wakefield Company, New York. The bell cord is carried through the center of the car in anti-swinging hangers.

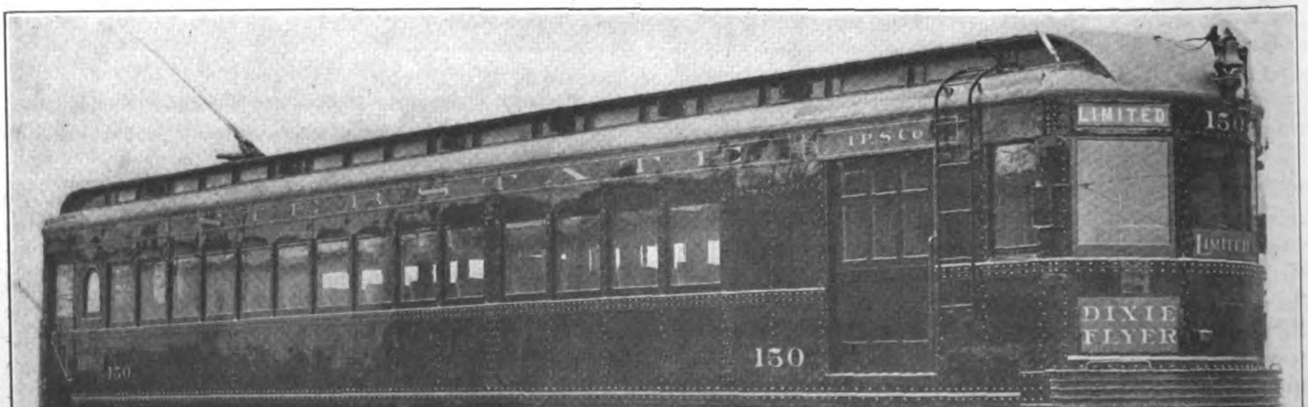
Monitor Deck Roof Design Used

After a study on the part of H. H. Buckman, master mechanic, the monitor-deck type of roof construction was decided upon because of the superior ventilating properties claimed for it. Ventilation is afforded by twelve deck-sash automatic ventilators supplied by the Automatic Ventilator Company and located two in the baggage compartment, four in the smoking compartment, five in the main passenger compartment and one in the toilet.

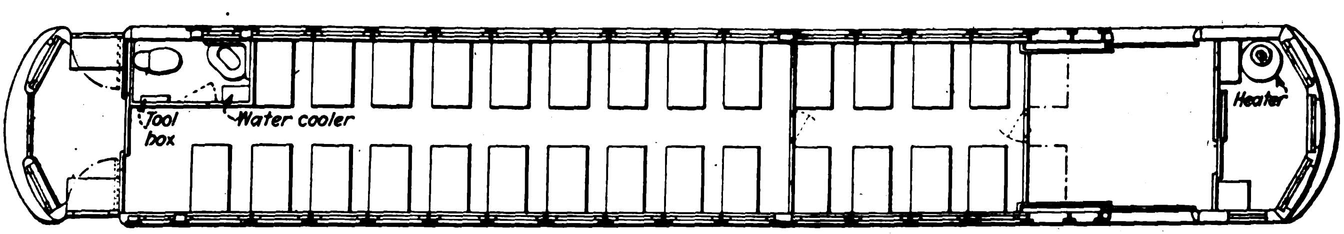
The rear vestibule is arranged with a door on either side and equipped with trapdoors so that the vestibule may be closed up tight. The platform is reached by mounting four steps of heights from rail to car floor of 16 in., 12 in., 12 in. and 12 in. The rear vestibule is also equipped with a train door, as it is the plan to use these new cars in limited service and haul trailers. No train door is provided at the front end, however.

The toilet is located just inside the rear vestibule and is equipped with a water-flushing bowl, wash basin, mirror, etc. The tool box is mounted on the inner partition and the water cooler is inset in the forward corner of the toilet. A 25-gal. tank for carrying the flushing and washing water supply is located overhead in the toilet room and is filled from either side of the car by attaching an ordinary garden hose to the pipe leading from the tank to that side of the car and fitted with the male end of a standard garden-hose connection. When the tank is filled through one of these pipes, the other acts as an overflow, and as these two pipes enter the tank at the top, no valve is necessary in either.

Through the use of the Peter Smith hot-water heater in the motorman's cab the full capacity of the baggage compartment is available for handling baggage and express shipments. Two folding sheets attached to the partition between the baggage compartment and the smoking compartment are available for use of passengers when the car is heavily loaded and there is room in the former. The motorman's cab is separated from the baggage compartment by a partition made of pressed steel sections with wood fillers, designed to protect the motorman from being crushed by the heavy



NEW HIGH-SPEED 62-FT. STEEL PASSENGER CAR OF THE INTERSTATE PUBLIC SERVICE COMPANY, INDIANAPOLIS, IND.



FLOOR PLAN OF INTERSTATE ~~TRAILE~~R USED ON LIMITED TRAINS

baggage coming forward in case of collision. This partition was built with 1¼-in. openings between the pressed-steel sections in order to let out the radiated heat from the stove and thus prevent the motorman's cab from being uncomfortably warm. The first three openings adjacent to the door, however, were covered with a plate to prevent any one from getting his fingers jammed when the sliding door is opened. An accompanying picture shows the construction of this partition and also the provision made for carrying the train signal lamps and flags.

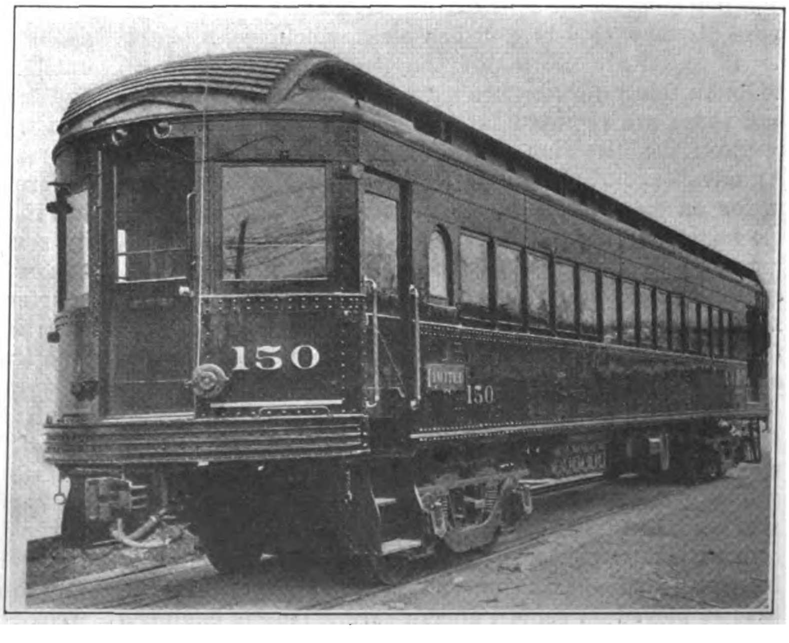
The arrangement of the motorman's cab is particularly interesting. The controller and brake valve are located for convenient operation from a sitting posture on a built-up seat adjacent to the window at the right side of the cab. Between the door and air valve is an instrument board on which is mounted an ammeter, the air gage and between these an order clip or holder, a snap-switch controlling the headlight, a push button for signaling the conductor as a check upon orders when approaching each siding, and a push-button switch connected with a small light which illuminates the train order when in place on the board. Just above the board are two small levers operating air valves, one of which operates the sander and the other a locomotive bell. The whistle valve is located overhead in the front corner of the cab and a cord from it hangs down at a convenient point for the motorman. Both the bell and sander valves are of the Viloco throttle type. The hand brake staff is located in front of the control mechanism and given an upper support and bearing on the triangular steel frame attached to the dash and supporting the control board and other mechanism. This hand brake is equipped with a large wheel and arranged for 100 per cent braking. A Drew mirror was installed on each front corner post wherein, from a sitting position, the motorman can look through the side cab windows into the mirror and watch the rear end. The Interstate motormen have found the two mirrors to be very helpful as a means of watching to see if the rear trucks split switches when negotiating city track special work, in addition to the usual use for observing passenger movements. By watching in the left or right mirror, depending on which way the rear trucks would go if the switch were split, the motorman will note immediately any sudden swing of the body or see the corner of the truck swing out and stop the car in time to avoid damage.

Located on the inside of the motorman's cab partition is the switch cabinet for controlling various car circuits. The telephone used in communicating with the dispatcher from points along the line is mounted on this same partition beside the switch cabinet, and a small writing desk on which to write orders is located just below the cabinet. There is also a rack on which extra jumpers, air hose, coupling pins, sleet cutter, shackle bar, etc., are carried. A light was installed in the switch cabinet and a hole cut in the top and bottom. The bottom hole permits light to shine on the desk where orders are written, and the upper hole on the heater gage. A ½-in. thick rubber mat is provided on which the trainmen can stand when using the telephone as protection against static shock.

LOCOMOTIVE BELL AN EXCELLENT ADVERTISEMENT

One of the unique features of these cars is their equipment with an air-operated locomotive bell to serve as a warning alarm in addition to the whistle and foot bell. It is a No. 602 Baldwin Locomotive bell which has a tone somewhat higher than commonly used on steam roads. The sound of this bell is claimed to carry better than the whistle, particularly under fog and high wind conditions. It is used at particularly bad crossings and while passing through the smaller towns, or anywhere that it is desirable to sound a warning continuously or repeatedly. The motormen are instructed to use the whistle as they have always done and to use the bell for an additional alarm. One consideration in this connection was that it is considerably cheaper to operate the bell than it is to blow the whistle repeatedly. The bell consumes 0.7 cu.ft. of air per minute while the whistle consumes 40 cu.ft. per minute. The officials of the railroad have also found that the novelty of the bell has been an excellent advertisement for the cars of the Interstate company. Furthermore, the traffic police of Indianapolis have encouraged the motormen to sound this bell at the main intersections where they are stationed, as it is very effective in helping them clear the streets.

Particular pride is taken by the designer and builder of these cars in the distribution of the various equip-



REAR OF STEEL MOTOR CAR, SHOWING END CONSTRUCTION

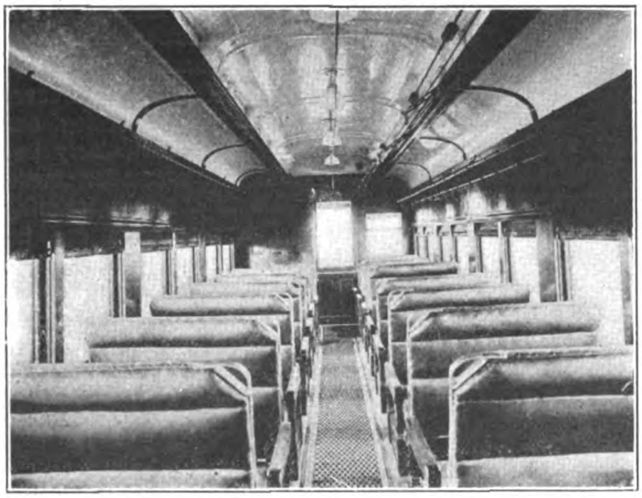
ment underneath the car. This has been accomplished in a way which has not only given an exceptionally even weight distribution but has left every piece of apparatus accessible. These new passenger cars were built by the Cincinnati Car Company.

DATA COVERING NEW PASSENGER CARS

Length over buffers	62 ft.	0 in.
Length over dash	60 ft.	6 in.
Height rail to top of roof	13 ft.	1 in.
Extreme width	9 ft.	2¼ in.
Width of seats		38 in.
Width of aisle		28½ in.
Rail to bottom of sill		43 in.
Length of rear platform	6 ft.	4 in.
Weight		95,500 lb.
Seating capacity		60
Post centers	2 ft.	8⅜ in.
Length of baggage room	8 ft.	3 in.
Truck centers (approximate)	39 ft.	0 in.
Wheelbase	7 ft.	3 in.
Size of wheels		36 in.
Baggage door opening	3 ft.	10¾ in.
Bulkhead door openings	2 ft.	4 in.
Rear door opening	2 ft.	5 in.

REBUILT CARS FOR TRAILERS

As it was planned to use trailers with the new motor cars in the fast limited service between Indianapolis and Louisville, the Interstate Company is planning to provide the trailers by rebuilding old motor passenger cars, one of which has been completed and placed in service thus far. This rebuilding work was done by the American Car & Foundry Company, Jeffersonville, Ind. While of wood construction, the trailer was given the appearance of a steel car by putting steel plates on the sides. The underframe was strengthened by using pressed-steel sections to reinforce the I-beams and channels. The ends were rebuilt to conform to the same radius as that of the motor car and reinforced with anti-telescoping construction similar to that used on the motor cars and anti-climbers. Both vestibules were inclosed, and while arranged for double-end operation, the vestibules were so built as to be used for an observation platform at the rear of the car. The end windows were glazed with ¼-in. polished glass which was brought down to within 12 in. of the floor. Four standard Pullman folding chairs are placed in this rear vestibule, and these are removed to the opposite end, if for any purpose the direction of running the car is reversed. An advantage of closing up the rear vestibule and using it for an observation platform is that it automatically blocks entrance and exit at this end and forces the ingress and egress of passengers at the forward end, so that when the trailer conductor is back throwing a switch or protecting the train, the conductor on the forward car can watch both the motor car and trailer entrances.



INTERIOR OF REBUILT TRAILER WAS FINISHED IN PLEASING WAY

The trucks used are old Peckham design with 6-ft. 4-in. wheelbase equipped with new springs and having good riding qualities. The old Gothic sash were removed and double letter boards installed. The car was also equipped with permanent storm sash. A smoking compartment was arranged for the trailer by building in a compartment at one end in a manner similar to that employed on some Pullman cars. This is equipped with two long cross seats which will seat eight passengers. The room is curtained off from the side aisle leading from the vestibule around to the main passenger section. A toilet equipped very much like that of the motor car was installed at the end of the car body opposite from this smoking room. The floor plan and various dimensions of this car may be seen in an accompanying drawing. The trailer is 51 ft. 3 in. long over buffers, weighs 54,000 lb. and has a seating capacity, including the four chairs on the observation platform, of fifty-one.

The hot-water heater is very neatly and compactly installed at the end of the car between the smoking room and the bulkhead and inclosed in a cabinet so that it is entirely out of the way and, consequently, unobserved.

The interior finish of the car is practically identical with that of the motor car, including the mahogany finish, white headlining, Wakefield fabrikoid covered seats, central lighting with two circuits of 94-watt lamps, etc.

The trailer and motor car are equipped with a Faraday signal system which is arranged in such a way that any conductor can send and receive a signal at the same time. Thus, if a rear conductor gives a stop signal while the forward conductor is passing up a go-ahead signal, the latter will get the signal from behind simultaneously and will be able to reverse the signal he may be giving. This is all worked out so that there is only a single wire between cars. The bell cord on one car rings the buzzer on the car ahead. The motorman's signal on the motor car is a single-stroke bell.

THROUGH PASSENGER SERVICE OF THE INTERSTATE

Through trains have been operated between Indianapolis and Louisville since 1908, this service requiring until recently the use of cars equipped for both 600 and 1,200-volt operation. For some time back six limited trains each way each day, making the trip in four hours, have been run. With the difficulties of two different voltages eliminated and the new cars in service, it is expected that this service will soon be replaced by seven limited trains a day each way, and that the run will be made in three and one-half hours. The shortening of the running time will be made as rapidly as track and power conditions permit. At present limited trains leave Indianapolis for Louisville at 7, 9, 12, 2, 4 and 7 o'clock each day. Northbound, trains leave Louisville at 7:30, 9:30, 11:30, 1:30, 4:30 and 6:30 o'clock every day. Southbound the trains are called "Dixie Fliers" and northbound "Hoosier Fliers."

When the new cars were installed Mr. Reid invited a party of prominent business men and city officials from Louisville to be the guests of the company for a trip to Indianapolis and return on one of the new cars. A week later a similar party of Indianapolis business men and officials was taken to Louisville and return. In addition to the special attention which these parties called to the Interstate company through the public press, the new cars have otherwise been the source of a great deal of very favorable advertising for the company and have undoubtedly attracted patronage to the road. The company also capitalized on the installation of the new cars for some good purchased advertising, though so much news matter about them appeared in the newspapers that not a great deal of purchased space was necessary to inform the public of the improvement which had taken place.

In two following issues will appear descriptions of the new freight equipment placed in service by the Interstate, the new shop layout, the changes in the power system and the new substations, the freight service and nature of business handled and other points of interest in connection with the making of a railroad out of the interurban lines between Indianapolis and Louisville.

Southwestern Association Meets

Publicity and Public Relations Formed an Important Part of the Program of the Annual Convention at Galveston on May 18-21

THE seventeenth annual convention of the Southwestern Electrical and Gas Association was held at Galveston, Tex., May 18, 19, 20 and 21, with somewhat more than 250 delegates present. A. Hardgrave of Dallas, president, presided during the convention, and H. S. Cooper, secretary of the association, occupied the secretary's desk.

At the closing business session Saturday C. E. Calder, vice-president of the Dallas (Tex.) Railway and other Strickland interests in north Texas, was elected president; Alba H. Warren, vice-president and general manager of the El Paso (Tex.) Electric Company and former general manager of the Galveston Electric Company, first vice-president; S. R. Bertron, Jr., of the Houston Electric Company, second vice-president; John W. Carpenter of the Dallas Power & Light Company, third vice-president; J. M. Dickey, Galveston, treasurer. The executive committee will choose a secretary, and it is assured that H. S. Cooper will be retained in this position. This committee will also select a meeting place for next year and fix the time for such meeting.

News of the death of Col. J. F. Strickland of Dallas, president of the Texas Electric Railway, the Dallas Railway and various other north Texas utilities, was received just after the convention adjourned, but the delegates still in the city were called together and adopted suitable resolutions expressing sympathy for the family of Colonel Strickland and expressing profound regret at the death of such a leader among the traction men of the country.

The convention was called to order Wednesday afternoon by President Hardgrave. Mayor-elect Charles A. Keenan extended a welcome to the delegates, and this was responded to by D. A. Hegarty, general manager of the Brush Electric Company of Galveston, on behalf of the association.

A feature of the first session was an address by Martin J. Insull of Chicago, president of the National Electric Light Association, who urged that the public utilities of Texas and of the entire country enter into a joint educational campaign with a view to acquainting the general public with the true condition of the various companies. He laid particular stress on the fact that in this way the co-operation of the people can be obtained. Mr. Insull also urged the various companies to offer for sale and to put on campaigns to induce their patrons to buy stock, thus making the companies more or less co-operative.

Mr. Insull also addressed the convention on Wednesday, this being his principal address. As senior vice-president of the Middle West Utilities Company of Chicago, which operates in more than 500 towns of the Middle West and East distributed in fifteen states, Mr. Insull stressed the value of publicity. The general public must be informed of the credit conditions of the various electric light and power and traction companies if the credit of these companies is to be restored and maintained.

Mr. Insull described the national advertising campaign projected during the last year by the National Electric Light Association, and explained that more than $1,000,000 had been spent to finance it. He said that this campaign is to assist the central stations of the electrical industry in obtaining friendly public opinion. For, he declared, if local agitation would die out, the ability of the local utility company to secure money would be improved. Mr. Insull declared that the American public is absolutely fair, provided facts are presented to it, and that the public utility companies need have no fear of the outcome if they centered in a publicity campaign.

President Hardgrave, Texas manager of the Middle West Utilities Company, in his annual address, delivered at the opening session, also stressed the need for a publicity bureau for the public utility companies. He declared that confidence between the public utilities and the people must be established, for, he said, the growth of a community depends upon the growth of the public utilities. One sure way to obtain this confidence, he said, is to encourage the purchase of stock in the utilities by the public. Mr. Hardgrave also recommended several changes in the constitution of the association, one being that the rule providing that the third vice-president be automatically promoted until he shall become president of the association be abolished. Mr. Hardgrave also stressed the importance of committee work, and recommended additional committees and that more questions be referred to committees for action. Work in committee, he said, will greatly increase interest in the association and promote efficiency in its work.

The report of the recently appointed "public policy" committee, of which W. B. Tuttle, first vice-president of the San Antonio Public Service Company, was chairman, was read and adopted. This report also laid great emphasis on the importance of a publicity bureau for the association. Mr. Tuttle recommended that a trained newspaper man be employed to head the bureau and that his special duty would be to keep the members of the association and the newspapers of the state informed about the public utilities. Mr. Tuttle also said that the best way to get the people of Texas interested in their public utilities is to induce the people to invest in the utilities.

The report of Secretary H. S. Cooper summarized the work of the secretary during the year and gave some statistics of the association. The association has now 166 member companies among the privately owned public utilities in Texas and the Southwest and there are also a number of honorary members, the secretary being one of them.

J. H. Gill, assistant general manager of the Dallas Power & Light Company, addressed the convention on Friday. Mr. Gill declared that many towns have literally starved their public utility companies to death, through lack of knowledge of what the utilities were doing. It is the duty of the people to come to the aid of these companies, he said, and added that in nine cases out of ten the aid needed will be forthcoming if the people are informed of the real conditions. Publicity and direct interest of the public in the utility company through stock ownership were the underlying thoughts of Mr. Gill's address, and his recommendations met the indorsement of the convention.

E. P. Schoch, head of the department of chemistry of the University of Texas at Austin, made a brief address, explaining in technical terms the latest developments in the tests of Texas lignite as fuel for steam boilers. Mr. Schoch predicted that developments soon would prove that Texas lignite is the cheapest boiler fuel that can be had in Texas.

The trend of legislation in regard to utilities was discussed on Saturday, the closing day of the convention. A plea for state control and sound financing marked the papers and addresses.

FORMER MISSOURI COMMISSIONER ADDRESSES CONVENTION

Senator William G. Busby of Kansas City, former chairman of the Public Service Commission of Missouri, discussed "State Utility Commissions." Mr. Busby first told of struggles the commission had had to obtain proper recognition from both the utility companies and the general public. He then related the work of the commission and told of the success that had been its lot. He declared that the life, health and happiness of the people and the progress and growth of a community or city depend upon strong, healthy utilities, and that it is to the interest of the people that the public utilities should be treated fairly in the valuation of their property and in fixing their rates. He further declared that this degree of fairness could be obtained only through state utility commissions. In regard to sound financing Senator Busby said that every community is known by the character of its utilities and that people do not want to live or transact business in a city or community without utilities, transportation and power and lighting facilities, and that unless the utilities are treated fairly, investors will refuse to advance funds for their development or extension and the public will eventually be the loser.

M. H. Gossett of Houston, president of the Federal Farm Loan Bank, next gave his viewpoint of financing Texas utilities. Mr. Gossett said the franchises granted to any utility should be protected by the community, for where competitors are permitted, the service of the utility is impaired and the financial rating of the company lowered. He illustrated his point by mentioning the situation in Houston, where the jitneys are permitted to operate as competitors of the street railway lines. Mr. Gossett said the ideal way for financing any utility is by selling stock to the company's employees and to the public.

W. B. Head, vice-president of the Texas Power & Light Company of Dallas, discussed the trend of public utility legislation in Texas. He traced the development of such legislation step by step and told of the law now in effect that places the control of utilities in the hands of the city where such utilities operate. City Councils and city commissions in Texas, he said, are given as much power and authority over public utilities as Legislatures in other states. The viewpoint of any city is naturally unfair to the utility, he said, and the result is that utility companies in Texas are suffering. Community control of public utilities, as tried out in Texas, is an absolute failure, Mr. Head declared. Many times the utilities serve much territory beyond the jurisdiction of the city government, he said, and this makes it imperative that control be vested in a state commission.

Home town financing was discussed by S. J. Ballinger, commercial manager of the San Antonio Public Service Company, and G. W. Fry, general manager of the Abilene Gas & Electric Company.

At the concluding session Saturday, M. M. Phinney of Boston, formerly connected with the Stone & Webster interests in Texas, was elected to honorary membership in the association.

At the railway section meeting a number of interesting topics were discussed.

Committees appointed at the closing session of the general meeting follow:

Executive Committee.—Burr Martin, A. Hardgrave, C. E. Calder, Alba H. Warren, H. C. Morris, Charles W. Davis, S. R. Bertron, Jr., F. D. Murphy, W. B. Tuttle, G. H. Clifford, Howard Smith, R. J. Irvine, D. A. Hegarty.

Advisory Committee.—H. O. Clarke, K. L. Simons, F. L. Weisser, H. E. Danner, B. F. Cherry, A. Patterson, W. E. Wood, J. C. Kennedy, James P. Griffin, P. E. Nicholls, H. E. Borton, Frank Frost, P. A. Rogers, P. W. Campbell, C. Mason, L. L. Stephenson, H. B. Hearn, W. A. Darter, V. W. Berry, H. P. Hess, H. E. Hobson, F. G. Kune, C. A. Newning, Mac F. Sterrett.

Finance Committee.—J. E. Van Horn, R. G. Soper, C. H. Dickey.

RESOLUTIONS ON DEATH OF COLONEL STRICKLAND

Just after the convention adjourned news of the death of Col. J. F. Strickland of Dallas was received, and the meeting was immediately called to order again and the following resolution adopted:

> In the death of Mr. Strickland not only has this association lost a loved and respected member, but also one of its founders, its first president, and one who has, in the seventeen years since, been a wise counselor and a vital force in all its work.
>
> We feel further that the entire public utility interests of Texas have suffered an irreparable loss, for Mr. Strickland was the undaunted pioneer in the wide distribution of electric light and power and electric transportation throughout the state, and the people of Texas owe him a debt which can never be repaid.
>
> And finally, as an employer, a counselor, a friend—even as an acquaintance—we will all miss him deeply and mourn him sincerely. Ever ready to aid, to advise, to be of use; kindly, courteous, generous and always just, we feel in his death a sense of personal loss which, at this moment, it is impossible for us adequately to express.

Merchandising Transportation

This Is the First of Several Articles on This Subject—The Author Considers, First, the Principles Governing the Successful Merchandising of Transportation and Then Shows What the Employees Can Do to Help

BY W. H. BOYCE
General Manager Beaver Valley Traction Company, New Brighton, Pa.

THE EMPLOYEES' FIELD DAYS BEGIN AT 8:30 A.M. AND END AT 11:30 P.M., SO THAT ALL CAN PARTICIPATE

YOUR success and the success of your company depend upon your ability to sell car rides.

It matters not what the expenses are if you can so merchandise transportation that there is a comfortable space between the expense and receipt lines when graphically displayed.

Selling rides depends in a very great measure upon:

1. The loyal co-operation, knowledge, interest and ability of your employees.
2. The methods you pursue to secure co-operation, impart company business knowledge, create interest and reward ability.
3. The proper maintenance of track, rolling stock and schedules.
4. The quantity, character and timeliness of your advertising through newspapers, car cards or pamphlets.
5. Your heart and surface attitude toward your public.

One reason that the sale of street car rides has not kept pace with the strides made in the sale of any other commodity or service is that as a rule street railway companies (on the theory that they could not afford it) have not paid salaries sufficient to attract new, worth-while blood, or to hold their more progressive employees. This short-sighted policy is comparable to that of the merchant who curtails his advertising as his business declines, and then makes generous appropriations to the advertising department when he has more orders than he can fill.

If your case is a usual one, your receipts have not kept pace with your expenses. You need more car riders. You need more than the commonly termed necessity riding. Therefore you must be possessed of reliable and up-to-date records concerning your actual traffic conditions and the traffic possibilities which your system affords. Careful study of these records should precede your merchandising plans, which might well be tried out on one route before a general application is made.

If you say to yourself that nothing more can be done to secure additional riders for your system your case is hopeless. No wonder you are not being paid more. You are probably howling and raving at the newspapers, the public, the commissions and your employees. Those methods will not sell car rides.

Finding out when, where and how people get to work and learning what it costs those who are not your patrons, in time and money, will form a basis for getting additional car riders.

It is true that you may not be able to adjust your service or rates of fare to get them all, but if for a starter you can get a few from each mill, factory, store or movie, that will be a great help.

The riding habit is a desirable thing to have your public acquire. They will acquire it if you are ever mindful of their desires, convenience and needs.

You must be not only a good mixer but you must use that trait to better your relations with your public. You must bear in mind that your employees and your public are entitled to their own viewpoints of your treatment or your service, and you must be able to visualize both sides of each question.

You must know that customers are sensitive. They go where they are invited and continue their patronage where well treated.

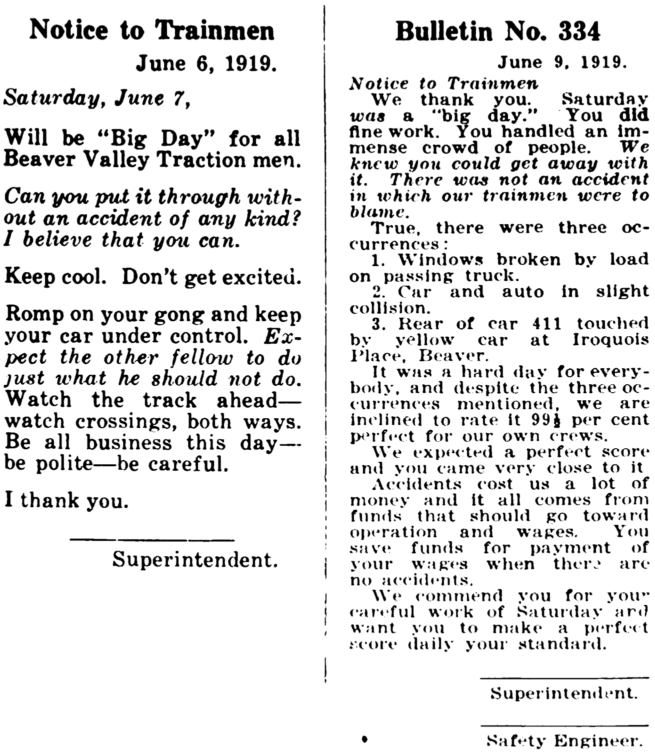
Your rides must be of a marketable quality. You must sell them in the size package for which there is a demand.

Business of all kinds is being built on the theory of giving the customer what he wants, or what he would want if he knew all the circumstances. It is your duty to give him what he wants, so far as possible, and to acquaint him with all the circumstances.

Service that suits your car riders—not you—is the service that counts in merchandising transportation.

The success of any business depends upon the hearty co-operation of all the employees. It is impossible suddenly to get a perfect working force, and therefore a good working organization comes through the process of evolution and elimination.

To secure the co-operation of employees they must know and feel that they will always be squarely dealt with, that fair and impartial treatment will always be accorded them, due consideration being given to each contributing factor, and that merit, not influence, will win. This policy, supplemented by meetings at which the proper kinds of addresses are made and by thought creating and correcting bulletins, should produce the desired results.



Notice to Trainmen

June 6, 1919.

Saturday, June 7,

Will be "Big Day" for all Beaver Valley Traction men.

Can you put it through without an accident of any kind? I believe that you can.

Keep cool. Don't get excited.

Romp on your gong and keep your car under control. *Expect the other fellow to do just what he should not do.* Watch the track ahead—watch crossings, both ways. Be all business this day—be polite—be careful.

I thank you.

____
Superintendent.

Bulletin No. 334

June 9, 1919.

Notice to Trainmen

We thank you. Saturday *was* a "big day." You did fine work. You handled an immense crowd of people. *We knew you could get away with it. There was not an accident in which our trainmen were to blame.*

True, there were three occurrences:

1. Windows broken by load on passing truck.
2. Car and auto in slight collision.
3. Rear of car 411 touched by yellow car at Iroquois Place, Beaver.

It was a hard day for everybody, and despite the three occurrences mentioned, we are inclined to rate it 99½ per cent perfect for our own crews.

We expected a perfect score and you came very close to it.

Accidents cost us a lot of money and it all comes from funds that should go toward operation and wages. You save funds for payment of your wages when there are no accidents.

We commend you for your careful work of Saturday and want you to make a perfect score daily your standard.

____
Superintendent.

____
Safety Engineer.

NOTICES SHOWING THE RELATIONS OF MEN AND COMPANY

Notices were sent to the trainmen telling about the "Big Day," and when it passed without accident the men were commended.

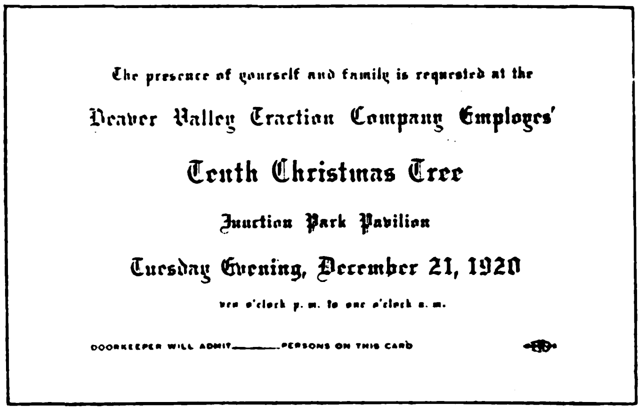
This is an everlasting job.

The knocker and the faultfinder are ever busy.

You must learn from all available sources causes of discontent. These sources may be secret as well as through your subordinates and employees' committee.

When causes are ascertained the remedy should be immediately applied, as it can be in most cases, for as a rule the cause is a trivial one.

Sometimes it is a hard matter to get the other fellow's viewpoint. You think of the days he has had off on full pay. He thinks of the overtime he has put in. You think of the enormous increase in his monthly wages. He compares the percentage of his increase with the percentage of increase that the laborer and steel mill worker has had. And so on to the dividing point if you and he don't get onto common ground and reach an understanding.



The presence of yourself and family is requested at the

Beaver Valley Traction Company Employes'

Tenth Christmas Tree

Junction Park Pavilion

Tuesday Evening, December 21, 1920

ven o'clock p. m. to one o'clock a. m.

DOORKEEPER WILL ADMIT______PERSONS ON THIS CARD

CHRISTMAS IS ALSO CELEBRATED

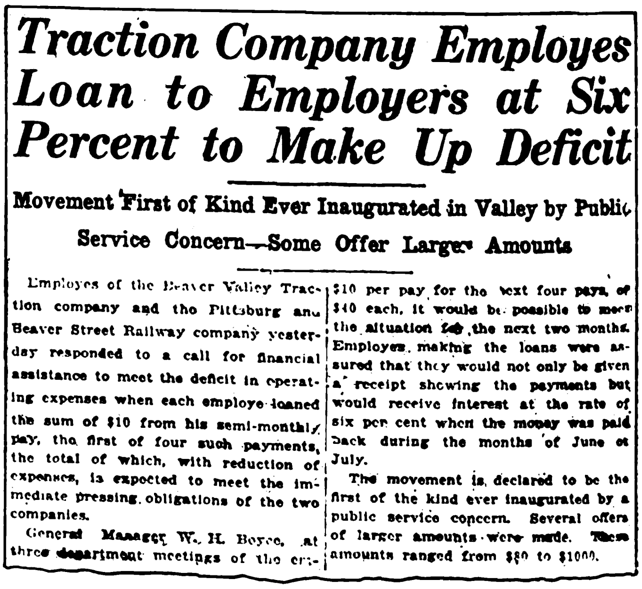
An understanding of how and why a good thing is done for him must be had by the average employee. He is naturally suspicious of anything "just handed to him." If you contemplate the presentation of a free life insurance or health policy or the creation of a pension fund, your employee must be made first to understand the why and wherefore and made to desire earnestly that which you would give. To thrust such things upon him creates suspicion.

Employees desire a medium of expression. Some of them prefer their committee. Some make use of the suggestion box and especially prepared suggestion blank, while some prefer to give expression to their views and feelings in an interview with an official of the company. These safety valves must all be kept free and working.

No matter how small the system no one man is big enough or closely enough in touch with all the conditions to know it all.

If an employee makes a verbal or written suggestion, whether good or bad, a written acknowledgment of that suggestion must be made and the employee advised of the action taken or contemplated. If the suggestion is not considered applicable, a reason must be assigned. The next suggestion of that same employee may save you hundreds or thousands of dollars. However, the next suggestion will not be forthcoming if your employee has any reason to feel that it will not receive careful consideration. Make an appeal for suggestions on some specific topic. Make of your suggestion box a question and answer box.

Department heads, as well as the rank and file, must



Traction Company Employes Loan to Employers at Six Percent to Make Up Deficit

Movement First of Kind Ever Inaugurated in Valley by Public Service Concern—Some Offer Larger Amounts

Employes of the Beaver Valley Traction company and the Pittsburg and Beaver Street Railway company yesterday responded to a call for financial assistance to meet the deficit in operating expenses when each employe loaned the sum of $10 from his semi-monthly pay, the first of four such payments, the total of which, with reduction of expenses, is expected to meet the immediate pressing obligations of the two companies.

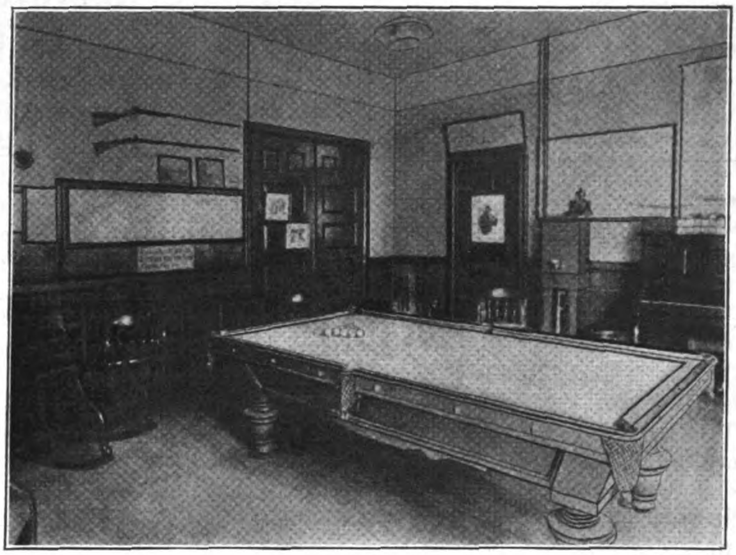
General Manager W. H. Boyce, at three department meetings of the em- $10 per pay for the next four pays, of $40 each, it would be possible to meet the situation for the next two months. Employes making the loans were assured that they would not only be given a receipt showing the payments but would receive interest at the rate of six per cent when the money was paid back during the months of June or July.

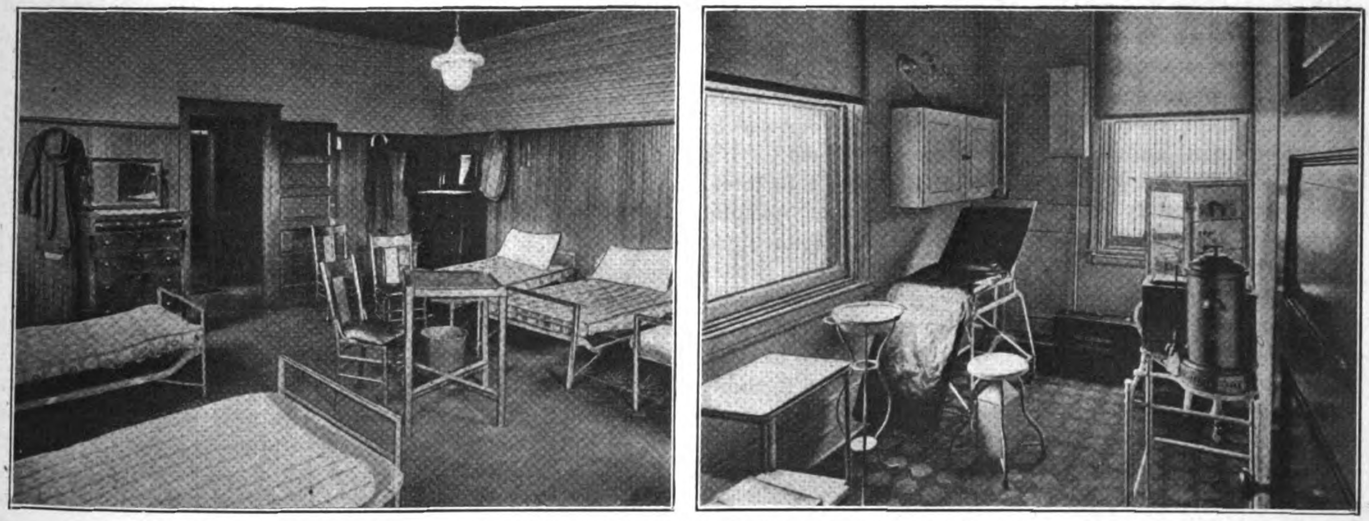
The movement is declared to be the first of the kind ever inaugurated by a public service concern. Several offers of larger amounts were made. These amounts ranged from $80 to $1000.

CLIPPING SHOWING WHAT THE MEN THINK OF THE MANAGEMENT at all times co-operate. They are not co-operating if they are faultfinding and complaining of the methods in vogue in other departments. It should be distinctly understood that it is not only the privilege but the duty of the head of one department to take up verbally with the head of any other department any known condition which is not to the best interest of the company or its employees as a whole.

Misunderstandings will be cleared up and may be prevented through the medium of frequent individual and round-table meetings. However, little good can result from these department head meetings if a choleric, self-opinionated individual presides. He must be big and broad enough to weigh carefully any proposition advanced.

Deliver me from being a stock, bond or job holder on a property the head of which "knows it all."





VIEWS IN THE MEN'S ROOMS; PREPARED FOR ALL THE NEEDS—RECREATION, REST, CURE

He who surrounds himself with subordinates who never have an original idea and who if they do have one occasionally are fearful of the consequences of advancing it is riding to a fall. Of what use are subordinate officers who agree with each and every proposition advanced by the management?

Railway managers today don't need vanity ticklers or looking glasses. They need the services of cartoonists. The following will help to secure the good will and co-operation of employees:

1. Get-together meetings such as at a Christmas tree celebration or a field meet for employees and their families.

2. The serving of hot coffee at a predetermined minimum temperature and iced tea or lemonade on July 4 or other holidays or days of heavy traffic on which employees are compelled to work unusually hard or overtime.

3. Free lunch for employees working overtime during stormy weather.

4. Properly caring for those injured through no fault of their own.

5. Insistence that men be not reprimanded in public.

6. Advertisements directed to the public acquainting them with the difficulties a public service employee encounters in a day's work and asking their indulgence and co-operation. Be sure that your employees see these advertisements.

7. Keep employees' quarters or lounging rooms clean and attractive and fitted with amusement devices.

8. Provide loan fund to keep them out of the hands of loan sharks.

9. In individual cases that demand it, furnish free medical or legal advice.

10. Give time and consideration to an individual employee or a committee of employees.

11. Keep the door open and give them the benefit of the judgment of individuals of your staff on personal matters.

12. Keep them acquainted with financial condition of the company.

13. Don't fail to give credit where credit is due.

The following statement is from a handbook given to each employee by the company with which the writer is connected:

> To the unlearned and the one who will not take the trouble to find out, and the one who will not be convinced when shown the facts, the solution of the street car problem is always "Too much watered stock." They *do not know anything about it. It is not a fact as applied to these lines.*
>
> *Besides—*
>
> Organization of the company or the amount of stock issued has nothing to do with the *service* you are to give the patrons of this line. All people must at times have something to be dissatisfied about. Many people pick the street car company and its employees for expression of that dissatisfaction—that is to be expected. In days gone by street car companies would let them go ahead and not enter any protest, and as a result, in the way of the "bully" who displays his power over the weak, a great many contracted the habit. That very growing popularity of find-

ing fault with the street car company has forced that animal to back up against the wall and fight for his very life.

Now—

Exhausted in finance, and wilted by competition, the tables are turning and the day looms up that the people must respect the rights of the company or the burden of furnishing this popular method of transportation will fall upon each community to furnish or do without. Up to the time of going to press with this book, a total of 498 miles of track was abandoned in the United States in the year 1918 alone.

And—

in no case did the faultfinders come forth and supply adequate transportation—the lines remain dead; property values dropped to a small percentage and live wire citizens deserted the community, *for with the loss of the cars life was not worth while there.*

So long as the company pays your wages (and be it in your opinion a just or an unjust wage, it is the one you agreed to work for), your every act should be in the interest of this company and when *you find it difficult so to act, we will gladly grant you a permanent vacation without pay. We have so many others to contend with that each employee should help lighten our burdens and good will then result for both of us.*

Getting More Power Out of the Locomotive

AT A MEETING of the New York Railway Club held in New York on May 20, 1921, George M. Basford read a paper on "Vitalizing Locomotives." This is of interest to men interested in the development of the electric locomotive as showing what this machine is up against by way of competition.

As an example of the progress that has been made with the steam locomotive Mr. Basford cites a well-known road which has increased its average revenue tonnage from 400 to 1,700 per train in twenty-five years, the maximum revenue tons handled in a regular train being 3,200. This road shows 233 per cent increase in weight of trains and 66 per cent increase in speed in this period. It hauls 5,000-ton trains on 25-mile schedules. Taking the country as a whole the average revenue train load increased from 475 tons to 728 tons since 1915, an increase of over 53 per cent. Increase in capacity of the steam locomotive has been due particularly to the superheater, the brick arch, the feed-water heater and the booster. Since 1910 the railroads have applied 33,000 superheaters to new and old locomotives, about 90 per cent of the new ones having been equipped during the past few years.

For many years arches have been used in locomotive fireboxes, their functions being to baffle the gases and flame on their way to the flue. Arches protect flues and flue sheets, increase the heat-making capacity of the coal and reduce boiler failures. In present practice they are carried on arch tubes which not only support the arches but contribute materially to forcing the circulation of the boiler. More than 43,000 locomotives now have these arches.

The application of the feed-water heater to the locomotive has been attempted many times and has waited only for a practicable heater and pump. Europe is far ahead of the United States in applying feed-water heaters to the locomotive, although for generations stationary and marine steam plants have used them as a matter of course. They have, however, been in successful use on locomotives during the four years past, returning for reuse about 15 per cent of the exhaust steam in the form of distilled and filtered water. The result is an increase in tender tank capacity, while at the same time heat from the exhaust steam is returned to the boiler in the feed water.

The booster is an auxiliary driving equipment which boosts the train in starting and at critical points on grades. It utilizes weight and steam that are not needed for other purposes at low speed, the only speed at which the boost is needed. The booster works like an automobile in low gear; it applies its extra power smoothly, avoiding the jerks that a big engine otherwise must give in order to get started.

House Approves Commerce Estimates

Would Give Hoover Funds to Carry Out Plans, Among Them Study of Possible Furthering of Standardization

WHILE it took a special rule to do it, the House of Representatives has approved the supplemental estimates for the Department of Commerce, recommended by the committee on appropriations, for extending the export trade; for investigating structural material; for assisting in the establishing of industries developed by the war and for standardizing electrical and mechanical devices used in industries. What opposition existed was entirely on political grounds, but the attack did not have the backing of the Democratic leaders, however, as Representative Byrnes, the ranking Democrat of the appropriations committee, declared that it was not a question of politics; that the business and the general interests of the country demand the promotion and extension of our commerce, domestic and foreign, and that every possible aid should be given to the administration.

Representative Good, the chairman of the committee on appropriations, in explaining the feeling of the committee in regard to the appropriations for the Department of Commerce, said, among other things:

"Mr. Hoover realizes that conditions in the world today are such that it is going to take the very best men he can get as counselors and advisers to help advise American industry and American commerce how our trade with foreign countries can be extended and enlarged. I was unwilling and the ranking Democrat on the committee was unwilling and every member of the committee on appropriations was unwilling to take the responsibility for denying this appropriation." In supporting the Bureau of Standards items, Chairman Good said, in part:

"Secretary Hoover called attention to the fact that through the National Screw-Thread Commission the hardware dealers of America were saved a capital charge of from $15,000,000 to $50,000,000 on their stocks of bolts alone. Mr. Hoover is convinced that hundreds of millions of dollars can be saved if a standardization of hardware alone can be brought about. So it is in all of the industries. Mr. Hoover estimates that one of the big elements of increased cost is the great number of different standards that every dealer must carry.

"The Secretary has in mind to build up an industrial unit that will standardize these various items. It is a big idea. It is a big thing. The Secretary of Commerce has done big things. He will do big things in the future for the country, if we of the House can adopt a progressive, constructive policy upon which he can build. We have placed in the Department of Commerce one of the greatest engineers in America and we are going to support him."

The Plight of Vienna's Railways

Austrian Capital Has Little More Than the Ruins of a Once Efficient Transportation System—Lack of New Material, Worn-Out Equipment, Decreased Traffic and an Inflated Currency Make Recuperation Difficult and Slow

THE end of the war found the electric railways of Vienna in a position extremely difficult in several ways. The exigencies of the war have taxed both the roadway and the rolling stock of the lines to an unprecedented extent. While the population of Vienna and the traffic increased, means of transportation were reduced. The municipal steam-operated lines were to a large extent reserved for the transportation of troops, and the number of horse-drawn and motor vehicles diminished gradually. This produced a large influx of street car passengers. The street car lines played an important part in the Red Cross service, more than 1,200,000 wounded having been carried by them during the war. Many cars were adapted for ambulance work and were withdrawn from ordinary passenger traffic.

Moreover, the lines took a large, and during the war increasing, share in the goods transportation within the precincts of the city. Even under ordinary circumstances such strain would have resulted in a run-down condition of the whole system. The shorthandedness in the repair shops and the increasing use of substitute material have added to the extent and progress of the deterioration. The limited resources of copper were reserved solely for army requirements. Steel wire for the overhead lines and aluminum as a substitute for the copper conductors of the motors had to be used. Especially the lack of good quality lubricants tended largely to wear out the rolling stock, and indirectly also the rails. At the end of the war the difficulty of maintenance, instead of diminishing, had increased.

The disorganization of all Austrian industry following the armistice produced a more serious stringency of material than ever existed before. The general labor unrest seized the repair shops of the street railways, the efficiency of which sank down in a sharp curve. Progress of work was frequently interrupted by strikes. Cars were withdrawn from service in increasing numbers, and the workshops were clogged by accumulations of repair work. To such conditions was added the distressing shortage of coal. Vienna has lost its main coal resources by the armistice to Czecho-Slovakia. The present Austria has deposits of coal, chiefly brown coal, the exploitation of which had, however, been neglected in pre-war times, and was, although considerably advanced during the war, at the end of it entirely inadequate for the country's requirements. Political and financial conditions prevented the country from obtaining sufficient supplies from other sources. As a result, the traffic had to be reduced considerably, and at times came to a complete standstill for days at a stretch. At the beginning of the coal shortage, which made itself felt even in the last years of the war, the number of stops were reduced from 980 to 682, as a remedy. This resulted in an energy saving of 8 per cent. Later on, lines were put out of operation entirely or partly. Also, operation was reduced according to the coal at disposal, sometimes to seven hours a day.

This shortening of working hours seems to have given the harassed management the necessary breathing spell for reorganizing operation and for making repairs. The difficulties had evidently reached their climax in 1919, and an improvement became apparent at the beginning of the subsequent year.

The basic factors of this improvement are the betterment of the coal supply and of the labor condition. Both have continued in a steady progress since then. The improvement of the system was, however, confined to narrow limits, not by the lack of efforts, but by the depreciation of the Austrian currency. The track mileage of the whole system has been increased since 1914 only by 7.5 km. (4.6 miles) to 274 km. (170 miles), 20 km. (12.4 miles) of which are operated by steam, the rest by electricity. All railroad terminals are now connected to the street-car system. For the new track, rails of the grooved-girder and the T-section type have been used.

For overhead conductors round copper wire of ⅜ in. diameter has been adopted, in place of the wire of special section used before. The tendency is gradually to replace the steel wire by copper wire, as expenses permit.

SYSTEM OF RADIAL AND RING LINES INTRODUCED

Many changes have been made with regard to routing. The old-time cross-town routes, connecting widely distant parts of the city by a circuitous way, have dwindled down to fourteen. According to the layout of the city, the main traffic is now being taken care of by a system of forty radial lines, intersected by ring lines. Fourteen of such ring lines are now in operation, the inner circle being the ring street, the famous boulevard of Vienna.

The number of cars in use has since the beginning of 1914 been increased by fifty-six motor cars, up to 1,542, and by seventy-nine trailers, to 1,628. It speaks well for the enterprise of the management that with a few exceptions this increase was effected in post-war years, in spite of the enormously grown expenses, the price per car being now 2,500,000 kronen ($6,250 as of May 18, 1921) compared with 25,000 kronen ($5,075 normal exchange) before the war. All additions to the rolling stock are fitted with the latest improvements, the motor cars being of the double-deck type, with specially cushioned trucks. The platforms of these cars and those of the trailers are completely inclosed. The separation of entrance and exit, introduced in Vienna simultaneously with America, is rigidly adhered to. The mechanical equipment of the cars has remained unchanged. As a novelty may be mentioned the gradual replacement of spur gears by herringbone gears of the Maag type.

Experiments have been made with street-sweeping machines attached to the cars, the testing of which is not yet completed. For the housing of the cars, several sheds have been erected, three of which are of reinforced concrete construction, with sufficient space for

270 cars. To the street car system is connected a system of several motor-bus lines, to act as traffic conveyors to the terminals of the lines. One of these lines is of the trackless-electric type. The whole rolling stock of this service consists of 47 cars.

HEAVY FREIGHT TRAFFIC DURING THE WAR

The goods transportation of the system decreased, due to the stoppage of military transport. From 1914, when goods transportation on street railways was introduced, up to the middle of 1920, nearly 1,400,000 tons were transported. It might also be mentioned that the Vienna street railways played an important part in the American relief work for the Viennese children in the transportation of food, of which 511 tons were conveyed during the year June, 1919, to May, 1920.

The accidents showed a decrease. The following data are given in this respect:

	1919-20	1918-19
Accidents, total	6,012	7,400
Number of injured	466	635

Most of these accidents were caused by passengers jumping on or off cars while in motion. Accidents of this kind averaged 5 per 1,000,000 passenger-rides. Of the total, 1,308 accidents were due to collision with other vehicles, 520 to knocking down of pedestrians crossing the lines, and the rest to various other causes. Eight hundred claims for damages were brought in against the street car company, of which 560 were settled by agreement and the rest in court. The total damages paid during 1919-20 amounted to 1,044,000 kronen for personal injuries, and 200,000 kronen for damage to property.

The following is an account of the operation and the revenue for the year June, 1918, to May, 1919, and the same period 1919-20:

STATEMENT OF INCOME

	1919-20 Kronen	1918-19 Kronen	Per Cent Change
Passenger revenue:			
Single fares	485,354,465	154,043,771	215.1
Time tickets	16,166,657	3,552,878	355.0
Line tickets	9,449,570	1,906,862	395.0
Special cars	115,725	99,754	16.0
Freight revenue	1,204,496	928,423	29.9
Total	512,290,913	160,531,688	
Share in revenue of Vienna Steam Railway	1,865,473	650,586	186.7

TRAFFIC STATISTICS

	1919-20	1918-19	
Car kilometers:			
Motor cars	36,740,953	37,304,283	*1.5*
Trailers	48,990,656	50,494,731	*3.0*
Freight cars	1,301,250	1,176,212	10.5
Total	87,032,859	88,975,226	2.1
Kilowatt-hours used	40,641,939	43,256,667	*6.0*
Revenue passengers:			
Single fare	443,004,424	531,626,528	*16.7*
Time ticket	21,415,200	16,159,800	32.5
Line ticket	16,629,124	12,427,572	33.8
In special cars	446,715	498,767	*10.4*
Total	481,495,463	560,712,667	14.2
Number of parcels carried by freight department	21,156	30,156	*29.8*

NOTE—Figures in italics indicate decrease.

The highest daily receipts of the year 1919-20 were 2,700,000 kronen and the lowest 492,000 kronen, the latter on a day on which operation was reduced to seven hours.

The most incisive change with regard to the Vienna street railway system is the increase of the rate of fares. Before the war the fare was 0.14 kronen (2.8 cents) on weekdays, and the highest fare 0.20 kronen (4 cents) on Sundays. It is at present 5 kronen ($1.02) on ordinary days and 7 kronen ($1.42) on Sundays. As a peculiarity it may be mentioned that the fare to the Vienna racecourse, roughly 2½ miles from the center of the city, has been fixed at 30 kronen ($3.09). For fares on late cars, running after the closing hour, chiefly for the connection between railroad terminals, 10 kronen ($2.03) is charged. Blocks of tickets of five each, at a reduced price of 4.50 kronen (91.5 cents) instead of 5 kronen, can be bought in advance, as a convenience to passengers. A very large use of these is being made. For the working people, cheap tickets for 3 kronen each are issued, available up to 8 o'clock in the morning. Transfer tickets have been abandoned completely, and instead return tickets were introduced at 7 kronen, available for two rides over the same line in one day. Children's fares are 1.50 kronen (30.5 cents). These equivalents are in pre-war exchange. From the following list the movement of the fares can be seen:

Charges in Rates of Fare		
Up to June 7, 1916	0.14 kronen	(2.8 cents)
June 7 1916-Aug. 28, 1918	0.22 kronen	(4.5 cents)
Aug. 28, 1918-June 11, 1919	0.30 kronen	(6.7 cents)
June 11, 1919-Dec. 3, 1919	0.60 kronen	(13.4 cents)
Dec. 3, 1919-Feb. 18, 1920	2.00 kronen	(40.6 cents)
Feb. 18, 1920-Jan. 27, 1921	3.00 kronen	(60.9 cents)
Jan. 27, 1921	5.00 kronen	(101.5 cents)

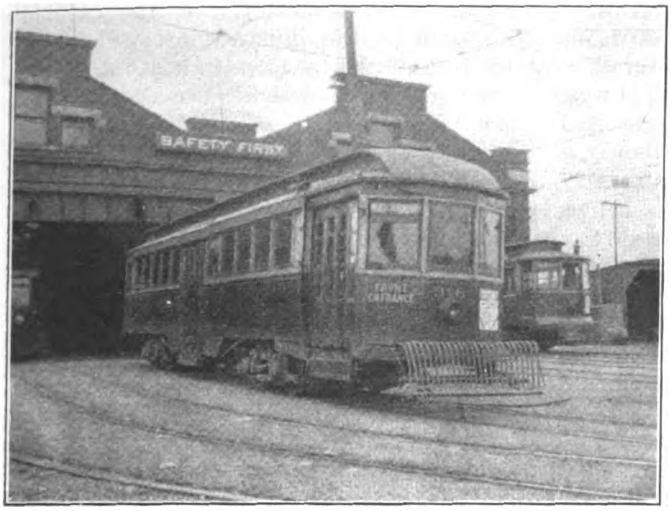
The rise of the fares was in each case followed by a sharp decline in the number of passengers. The experience was that after each drop of this kind a recovery set in, the number of passengers increasing steadily, and ultimately settling down somewhere in the middle between the highest and lowest point of the decline. The revenue did not, therefore, rise in proportion to the increase of fares.

No figures are available for expenditures, but the fact that the street car system, which is owned by the community of Vienna, is still needing a large subsidy, makes it evident that the revenue did not keep pace with expenditure. The following data indicate the ratio of increase of the main items of expenditure and of the revenue, and the relation in which both stand to the depreciation of the currency:

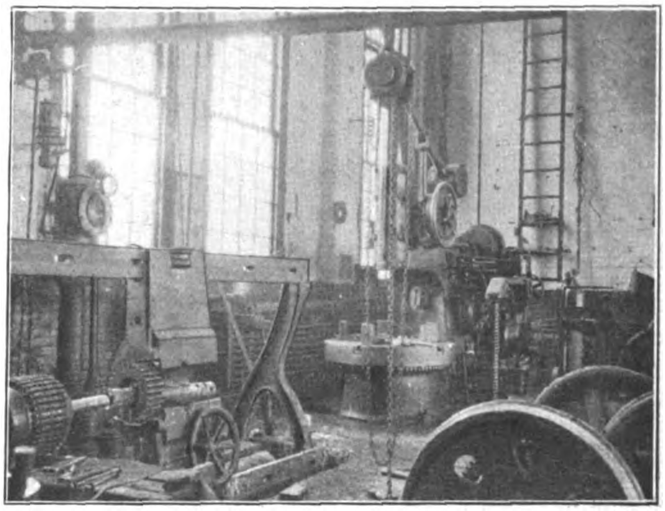
Depreciation of currency	1 : 127
Rise of rate of fares	1 : 35
Increase of wages	1 : 35
Increase in cost of new track	1 : 75
Increase in cost of rolling stock	1 : 100

REVENUE STILL MEAGER COMPARED WITH OPERATING COSTS

The increment of revenue is not even sufficient to offset the increase of operation cost. The enormously increased cost of maintenance stands, however, quite out of proportion to the present revenue. Although the strictest economy is observed, it is impossible to balance the expenditure. The street car system is a heavy burden on the already overstrained finances of the city, which is finding it very hard to supply the funds necessary for its upkeep. The State Treasury will, therefore, have to come to the rescue, if general conditions do not improve, but of this there is a fair promise. A marked betterment of trade conditions and industrial activity is also noticeable, and the town traffic is consequently picking up. If this improvement continues, the street car system will gradually get back into a healthier condition.



THIS VIEW PROVES THAT THE NEW YORK STATE RAILWAYS, UTICA LINES IS BEHIND THE SAFETY MOVEMENT



WORK IS A PLEASURE IN THIS BRIGHT AND CONVENIENT CORNER IN THE WHEEL SHOP AT UTICA PARK

Shop Notes from Utica

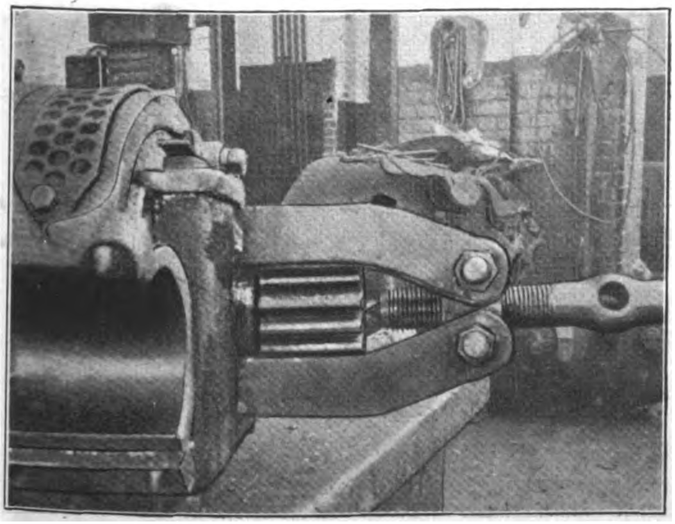
Some Kinks that Have Proved Useful Locally in the New York State Railways' Maintenance Work—Attention to Details Is the Particular Feature Which This Article Aims to Stress—Some Items Mentioned Are a Pinion Puller, a Paint-Spraying Outfit, Jigs for Reclaiming Worn Commutator Segments and a Heater-Coil Winder

THE shops of the New York State Railways at Utica Park, Utica, were recently rehabilitated. The changes were covered in an article by H. S. Sweet, then master mechanic at this point, appearing in the issue of the ELECTRIC RAILWAY JOURNAL for March 20, 1920, page 567. Mr. Sweet showed how a few inexpensive changes had almost doubled the overhauling capacity of the shops. The shops are not only well laid out for their purpose, but in them a number of kinks have been developed which also tend to facilitate maintenance work.

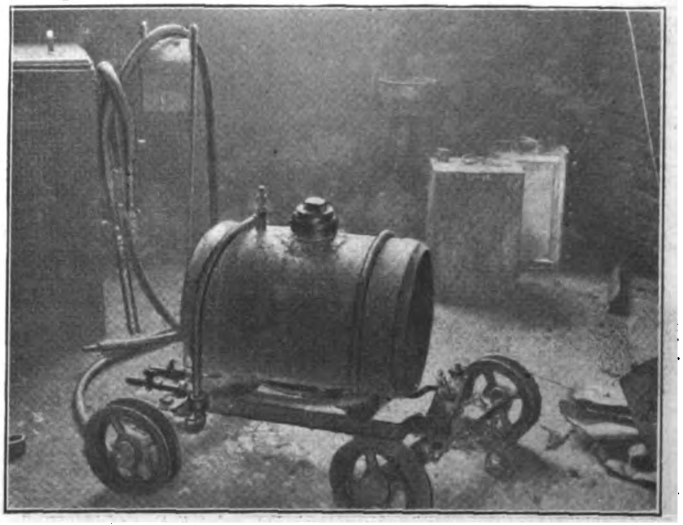
A typical shop corner is shown in one of the photographs reproduced, which features a type of wall gib crane found very useful in the shop. It consists simply of a piece of T-rail hinged to the wall with a guy rod above. The T-rail boom carries a differential hoist, traveling on a trolley. This corner is in the wheel room and it contains the wheel press and boring mill conveniently placed to facilitate wheel and axle handling.

Another illustration shows a convenient pinion puller, consisting of two links made of steel straps which are hinged on a nut. Through the nut passes a threaded rod with pointed end for centering in the end of the motor axle. When the links are hooked over the pinion and force is applied, the links tend to bind tightly on the pinion and do not slip off. With this device pinion pulling is a very simple operation.

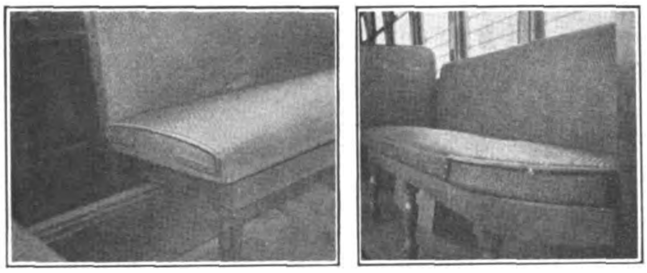
Another time and money saver is a pair of tools used in cutting down worn controller segments to render them available for reuse. The left-hand device shown is a clamp to hold the worn bars and acting as a saw guide during the cutting-off operation. A pin on the



A ONE-MAN PINION PULLER THAT WON'T SLIP OFF AS IT IS TIGHTENED



THIS QUEER LOOKING DEVICE IS A HOME-MADE PAINT-SPRAYING MACHINE



SEAT CUSHION GUARDS WHICH SAVE THE EXPOSED EDGES

inside of the clamping box, not visible in the picture, acts as a stop. The right-hand device is the jig for use in drilling. The construction is similar to the sawing jig except that the clamp is provided with a hardened bushing as a drill guide and there is no base, the device as it stands being very convenient for use in the drill press.

Another useful little device is a motor-driven winding machine, used for winding up heater coils on porcelain cores. The particular feature here is the provision for preventing breakage of the cores by excessive and irregular application of force in clamping. The spindle which carries the porcelain core is supported only at one end, which may for convenience be termed the headstock. At the headstock end of the spindle is a cup-shaped socket to receive one end of the core. The spindle also carries an adjustable clamp on which is mounted a second socket, attached to it by means of a coil spring. When clamped between the two sockets, the core is flexibly but firmly held to the spindle.

HOME-MADE PAINT-SPRAYING DEVICE IS USED IN UTICA SHOPS

As some spray painting is done in the shop, the portable spraying machine shown in another picture is found very useful. This consists of an auxiliary air-brake reservoir mounted on a tiny truck which rolls on old trolley wheels. Air pressure is applied to the reservoir to force the paint to the nozzle where it meets a stream of air supplied from the shop's compressed-air system. The nozzle used in connection with this device is also home made, consisting simply of a short straight piece of ½-in. gas pipe with another piece entering at the side, stop cocks being inserted in both pipes to control respectively the flow of paint and air.

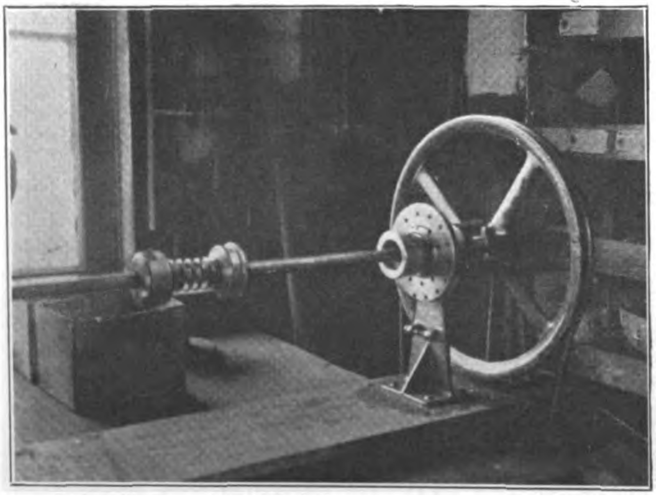
While not exactly a shop matter, the iron cushion guard, shown in two of the illustrations, will be of interest as a product of this shop. On account of the rapid wear of cushion edges exposed to use as foot rests, or located at points where they would be subjected to rubbing, the shop management bent up some ⅜-in. rods, flattened out the ends and drilled the resulting guards for convenient attachment to the cushion frame. The result has been a greatly increased cushion life.

The picture at the head of this article is a view taken in front of the carhouse adjoining the Utica shops. It features two items: The enormous safety-first sign, which reaches the eye of the motorman of every car entering the barn; the other is the car in the foreground, which is one of a number remodeled from the open type for front-end center-entrance fare collection. This car, as Kipling would say, "is another story," which was told in last week's issue.

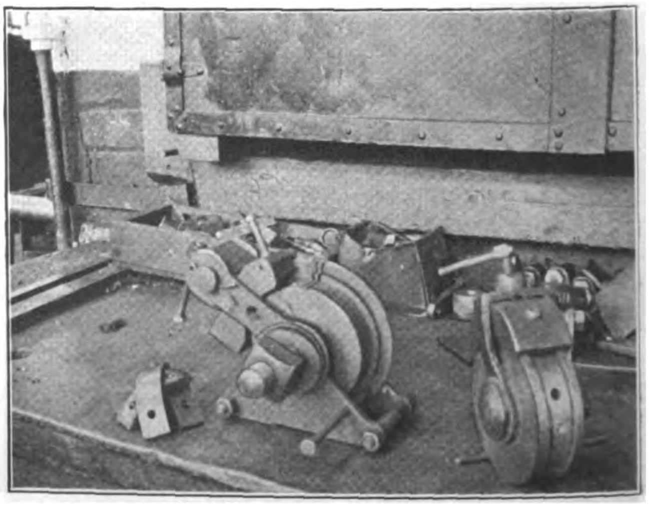
A. S. M. E. Nominations

AT THE MEETING of the American Society of Mechanical Engineers, held in Chicago May 23 to 26, the report of the nominating committee was presented, which, although the nominations must be submitted to the society for letter ballot, may be assumed to represent the choice of the membership.

The list of nominations is as follows: For president, Dexter S. Kimball, dean College of Engineering Cornell University; vice-presidents, Col. E. A. Deeds, Dayton, Ohio; Robert Sibley, McGraw-Hill Company, Inc., San Francisco, Cal., and L. E. Strothman, Milwaukee, Wis.; managers, W. S. Finlay, Jr., New York City, to fill out Dean Kimball's unexpired term as manager, S. F. Jeter, Hartford, Conn.; H. P. Liversidge, Philadelphia, Pa., and Hollis P. Porter, Tulsa, Okla.; for treasurer, Major William H. Wiley, New York City, who has occupied this office for thirty-seven years. To represent the society on the board of the Federated American Engineering Society the following were nominated: Francis Blossom of Sanderson & Porter, New York, N. Y.; Charles A. Booth, Buffalo, N. Y.; Gano Dunn, president J. G. White Engineering Corporation, New York, N. Y.; H. H. Esselstyn, Detroit, Mich.; W. S. Lee, president Piedmont & Northern Railway, Charlotte, N. C.; I. E. Moultrop, Boston, Mass.; John A. Stevens, Lowell, Mass.; A. E. Walden, Baltimore, Md.; Perley F. Walker, Lawrence, Kan.



A WINDING MACHINE FOR HEATER COILS WHICH DOES NOT BREAK THE CORES



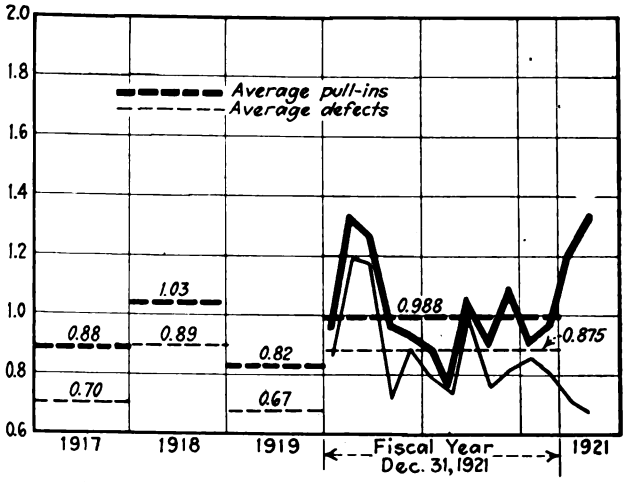
TWO JIGS FOR USE IN RECLAIMING CONTROLLER SEGMENTS

Master Mechanic Proves His Worth

Statistics of Pull-Ins and Car Defects Tell Graphic Story of the Efficiency of the Master Mechanic—Graph Also Acts as Check on Transportation Department

ON A CERTAIN property, which must necessarily remain unidentified, statistics are kept and recorded graphically for each carhouse with reference to all pull-ins on the basis of number of pull-ins per thousand car-miles and corresponding records of defects are likewise plotted. Curves 1-a and 1-b were taken on this property and indicate graphically the efficiency of a certain master mechanic, "A," who was in charge of both houses. In connection with these two graphs, graph 2 should also be noted, because this is the property to which this particular master mechanic transferred when he left the former property. At the end of 1917, which, as noted, showed a very small number of pull-ins, master mechanic "A" left property No. 1 for a better opportunity at property No. 2. The year 1918 shows a record of pull-ins which is extremely high, and at the end of this year master mechanic "B," as he may be called, was removed to make a place for some one who might have an opportunity to make a better record. Master mechanic "C" was then installed and his record for 1919 speaks for itself, indicating him to be an efficient man. At the end of this year, for some reason, his services were no longer available to the company and he was replaced by master mechanic "D." New equipment was installed in carhouse *a*. The immediate rise in the pull-in curve of carhouse *b* is dramatic, and it is pertinent at this point to say that master mechanic "D" was relieved from his duties when this curve reached its peak, master mechanic "E" then coming on and making his presence felt by the immediate drop in this curve.

Returning to master mechanic "A," he entered the employ of the second company at the begining of 1918. Graph 2 is the record of the principal carhouse of his division, and it is seen that the year 1918 shows a low pull-in record as compared with the previous 1917 record for this house, and that 1919 shows a still lower record. In 1920 this man was promoted to another position in this company, and that the loss of his immediate presence was felt by the division from which he moved is apparent from the graphical analysis of the pull-ins and defects.

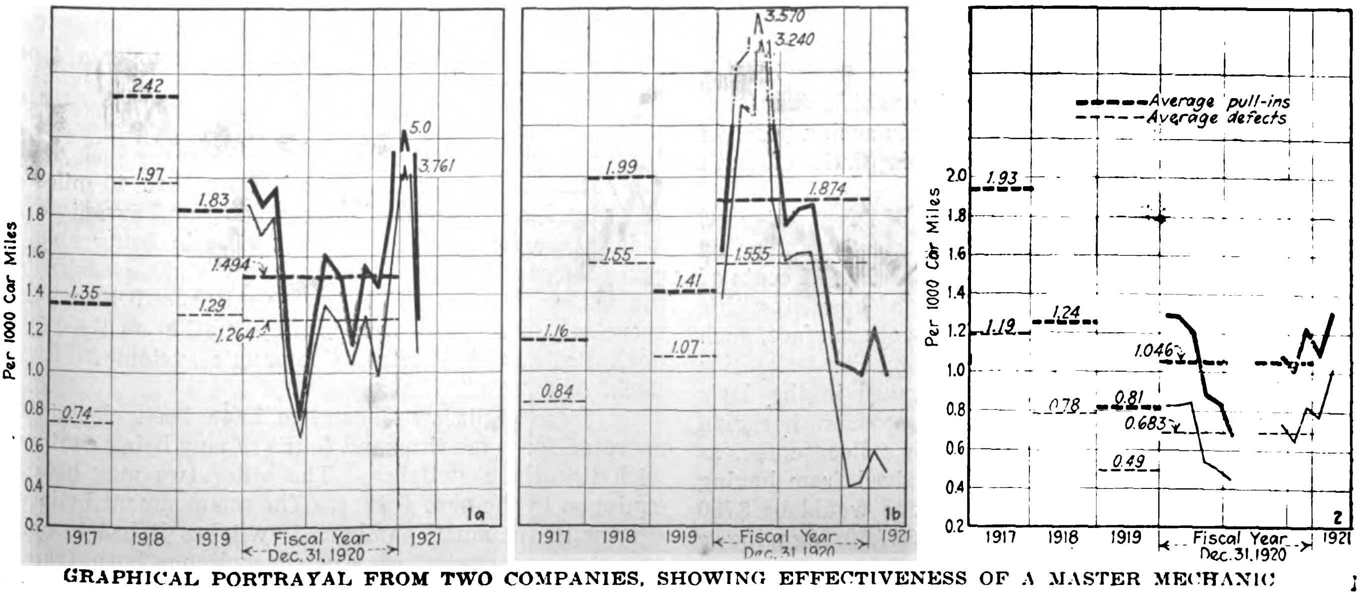


GRAPH SHOWING SPREAD BETWEEN DEFECTS AND PULL-INS AS A CHECK UPON TRANSPORTATION-MECHANICAL DEPARTMENT CO-OPERATION

TRANSPORTATION DEPARTMENT ALSO CHECKED

This method of keeping track of these two records of rolling stock also gives an opportunity to note the co-operation which exists between the transportation and mechanical departments. Theoretically, of course, the number of defects per thousand car-miles should coincide with the number of pull-ins per thousand car-miles; in other words, best operation by the transportation department would mean that there should be no pull-ins without cause.

The general management which operates this entire group of properties from which these curves are taken uses this as a basis of check-up on the transportation department with good results. In the single graph shown independently it is noted that toward the end of 1920 the spread between pull-ins and defects commenced to increase to alarming proportions, indicating a very large number of pull-ins where there was no defect. A new superintendent of transportation has been installed on this property with results which the management says amply justify its decision that this spread was due to poor supervision in the transportation department.



GRAPHICAL PORTRAYAL FROM TWO COMPANIES, SHOWING EFFECTIVENESS OF A MASTER MECHANIC WHO PROVED HIS WORTH

Motor Vehicles Must Pay Their Way

Commissioner of Highways of State of Connecticut Says Traffic Benefited by Highway Improvement Should Bear the Cost

AT A NATIONAL highway and traffic conference held at Yale University on May 23 the subject of traffic regulations in streets and on highways was discussed by several prominent leaders. Papers were presented by William Eno, honorary president of the Highway Traffic Association of the State of New York; William J. Bennett, Commissioner of Highways, State of Connecticut; Dean A. N. Johnson, department of engineering of the University of Maryland; Miss Harriet E. Beard, Department of Education, Detroit, Mich., and James W. Inches, Commissioner of Police, Detroit, Mich. There was a general recognition of the increasing problems of regulation of highway traffic and the need of leadership in this line of work. Mr. Eno outlined various traffic regulation schemes which have been placed in operation in various cities all over the world, in order to expedite the traffic. Miss Beard discussed the educational work which was being done in the schools of Detroit with a view to reduction of accidents in traffic. Dean Johnson discussed largely highway construction, and Mr. Inches the Detroit traffic regulation system.

Commissioner Bennett pointed out that there must be somebody, some central organization, to standardize practice and to lead. A highway administrative engineer, he said, must be a student of transportation rather than a technical expert of highways. He must study all kinds of transportation to see how the highways fit into the general scheme and how they should absorb their part of the load. He pointed out that at present there is an overdevelopment of highway traffic in proportion to the total, due largely to the overdevelopment of the vehicle which is used for highway transportation. In other words, there has been a short-sighted direction of capital in so far as the best benefit for the whole public is concerned. Funds have been devoted to the development of a vehicle and thus have not been available to the increasing of necessary rail facilities.

He showed that there are two classes of highway traffic, the first commercial, the second passenger, and that highway construction which will take care of the first will naturally take care of the second. Connecticut itself is in a peculiar situation, for, according to the manufacturers of motor vehicles themselves, 125 miles is the maximum of economical motor vehicle transportation of freight, and Connecticut lies in such a position geographically that it is within this limit of both Boston and New York.

Some of Mr. Bennett's figures are of great interest. Figuring the total cost of operating a certain type of motor truck in Connecticut as $26.09 per day, 11 cents of this is state tax. If the relative cost of operating this truck on dirt roads and on a hard, smooth surface, such as the state provides, is taken into consideration, it is figured that there will be about $3 saved in the day's expense by operating on hard smooth roads rather than on dirt roads. If this is turned into a license fee, as is logical, since this is the benefit derived from having the state construct a road, then the fee would be $750 per year compared to the present $27.50, figuring a 250-day operation in the year. In Connecticut particularly there is slight local benefit due to hard surface roads, so that traffic which uses the road should bear the cost.

The commissioner said he was not prepared to divide the cost between the two classes, but that a definition was desirable. He did state as a much-emphasized fact that the state should not subsidize commercial traffic on highways, but that it should get enough in fees to pay for the cost of rendering the service to this class of traffic. Commercial traffic on the highways is here to stay and it should pay for the extra service which is given to it.

As to the maximum load which could be carried on motor vehicles, the commissioner was not prepared to say, except that his own view was that 28,000 lb. gross was the greatest load that should be allowed upon improved highways. Of course, it would be physically possible to build a highway for any load, but some economic limit must be set and highways built to that limit. Connecticut now has a new bill, which will probably be passed shortly, the commissioner said, which will limit the truck to such a weight and will also prescribe the weight per inch width of tire and make other regulations as to division of load between forward and rear axles.

Changes in the Cost of Living Since 1914

THE National Industrial Conference Board, New York, has issued another report on cost of living, based on its own figures for retail prices of clothing, furnishings and fuel and the index numbers of the United States Bureau of Labor Statistics with regard to food.

The total increase in the cost of living from the beginning of the war to March, 1921, the investigation shows, was 68.7 per cent. The rise in the cost of the major items of the budget of wage earners between July, 1914, and March, 1921, is estimated to have been as follows: Food, 56 per cent; shelter, 71 per cent; clothing, 74 per cent; fuel and light, 87 per cent; sundries, 85 per cent.

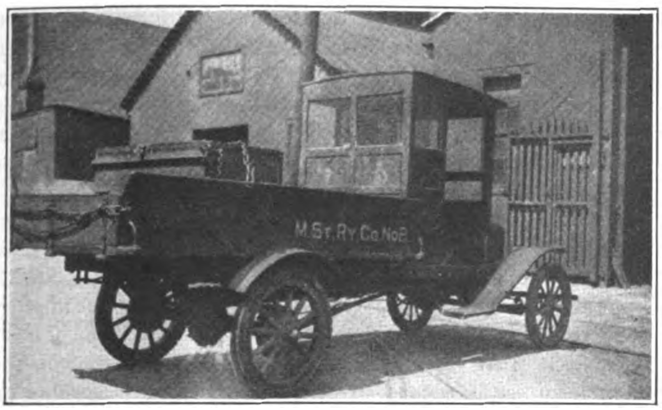
Since July, 1920, the total cost of living has decreased 17.5 per cent. Food has decreased 29 per cent, clothing 35 per cent, while shelter has increased 8 per cent and fuel and light 13 per cent, no change having taken place in the cost of sundries.

Since the beginning of last November the total cost of living has decreased 12.6 per cent, food showing a 19 per cent decrease, clothing a 23 per cent decrease, fuel and light a 6.5 per cent decrease and sundries a 4 per cent decrease.

Electrified Track Switches

WHEN a railway system has more than 40 miles of track and operates between sixty and seventy cars it is either fortunate or very capable in being able to route its cars so that there are only eight switches on the entire system which have to be used in normal operation. Such, however, is the situation on the Little Rock Railway & Electric Company's system in Little Rock, Ark.

Of these eight switches, two have been electrically operated for some time and four are now being equipped with Cheatham switches. The other two may also be equipped in the near future. The management believes, even with the small number of switches it has to operate, that it pays to use electric switches both from a time-saving and a safety standpoint.



THE MONEY BOX IS CHAINED TO THE CHASSIS OF THE TRUCK

Memphis Cash Wagon Defies Hold-Ups

Ford Truck with Triple Locked Strong Box Used to Carry Daily Receipts to Bank, Some Distance Away, in Memphis—Saves Money Over Previous Method of Handling

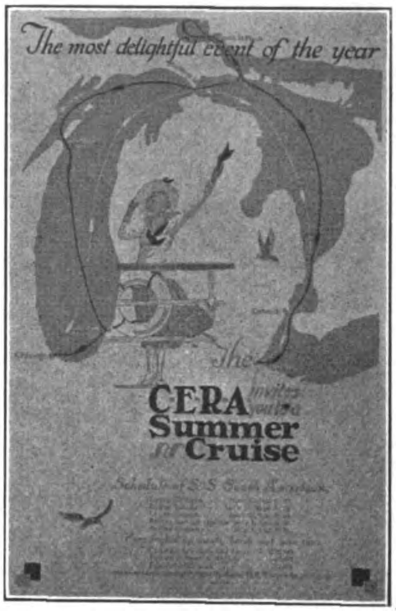
ACCOMPANYING illustrations give a good idea of the method now employed by the Memphis Street Railway to transfer its daily receipts from the company's headquarters to the bank. As noted, the cash wagon consists of a Ford chassis with a specially constructed heavy truck body, on which truck is placed a very heavy two-compartment iron box built from boiler plate. This iron box is chained to the truck by a heavy log chain, which is securely padlocked to the sides of the chassis. The box has a lower and an upper compartment, each of which is equipped with an iron door, which is padlocked shut. The actual cash is placed in smaller iron box containers about 8 in. x 12 in. x 16 in., which are also padlocked shut. These latter containers are equipped with a sort of harness or carrying hammock with handles so that two men can easily carry one of them.

When the truck is loaded with its daily receipts, all padlocks are locked and keys are left in the cashier's office. Three men accompany the truck on its trip to the bank, some distance away from the office, which is at the carhouse out on the system. Another set of keys is kept at the bank, so that the men on the wagon do not have any keys to any of the locks.

The former method of handling this transfer of cash daily in Memphis was to have two men assigned to each of these small iron cash boxes, the whole group of men being sent to town on a special street car. This was naturally not economical in the use of men's time, for ten boxes needed twenty men to transport them. The company figured that there is a saving of at least $3 a day by the present method over the former one.

All Aboard for the C. E. R. A. Summer Cruise

THE Central Electric Railway Association committee on arrangements is trying some publicity within the industry in connection with its summer cruise. The accompanying illustration shows one of its 5-in. x 8-in. poster cards announcing the schedule of the SS. *South American*, which leaves Chicago at 8:30 a.m. on July 26, leaves Toledo on the return trip at 10 a.m. on July 28 and arrives at Chicago at 1 p.m. on Aug. 1.

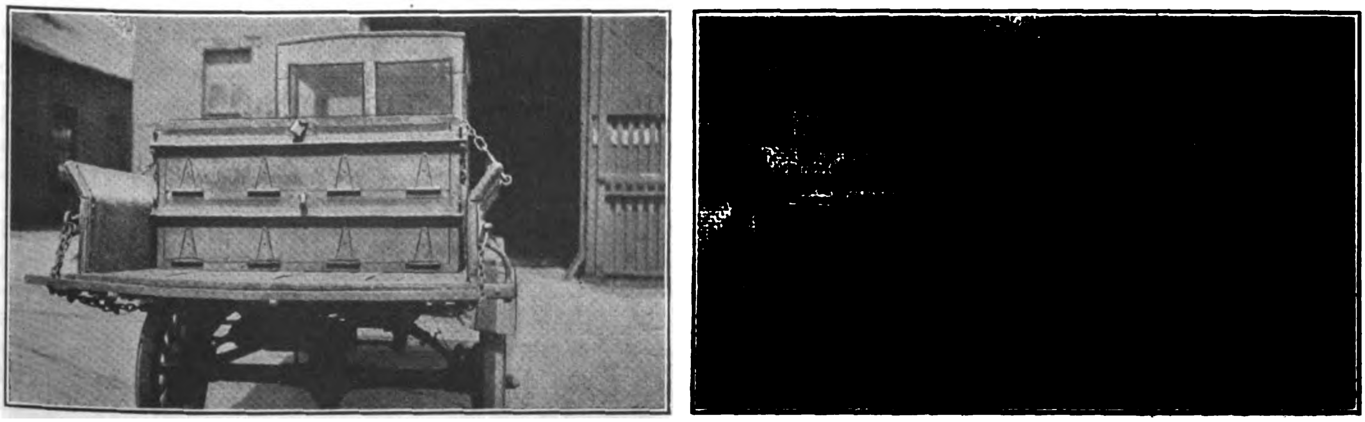

The most delightful event of the year
The
CERA
Summer
Cruise

C. E. R. A. POSTER

On the reverse side of this card is a long list of names signed under the motto "We will see you on the boat." The Central Electric Railway Association wants all railway men to take advantage of this summer cruise, the ladies also being welcome. A good program is promised. Reservations are in the hands of John Benham, secretary of the association, 15 South Throop Street, Chicago, Ill.

"Movie" as Publicity Agent

Many stockholders of the Chicago Railway Equipment Company and their friends were guests of the company recently at an educational film show given at the Woman's Club in St. Louis. More than 6,000 feet of film descriptive of the company's activities made up a portion of the serious part of the entertainment. Originally the company began in St. Louis with one plant, started in 1888. It now has headquarters in Chicago and five subsidiary plants in the East. E. B. Leigh, president of the company, presided and explained the motion pictures.



TWO VIEWS OF THE MEMPHIS CASH WAGON. SHOWING VARIOUS DETAILS

Simple Inspection Method and Record for Small Shop

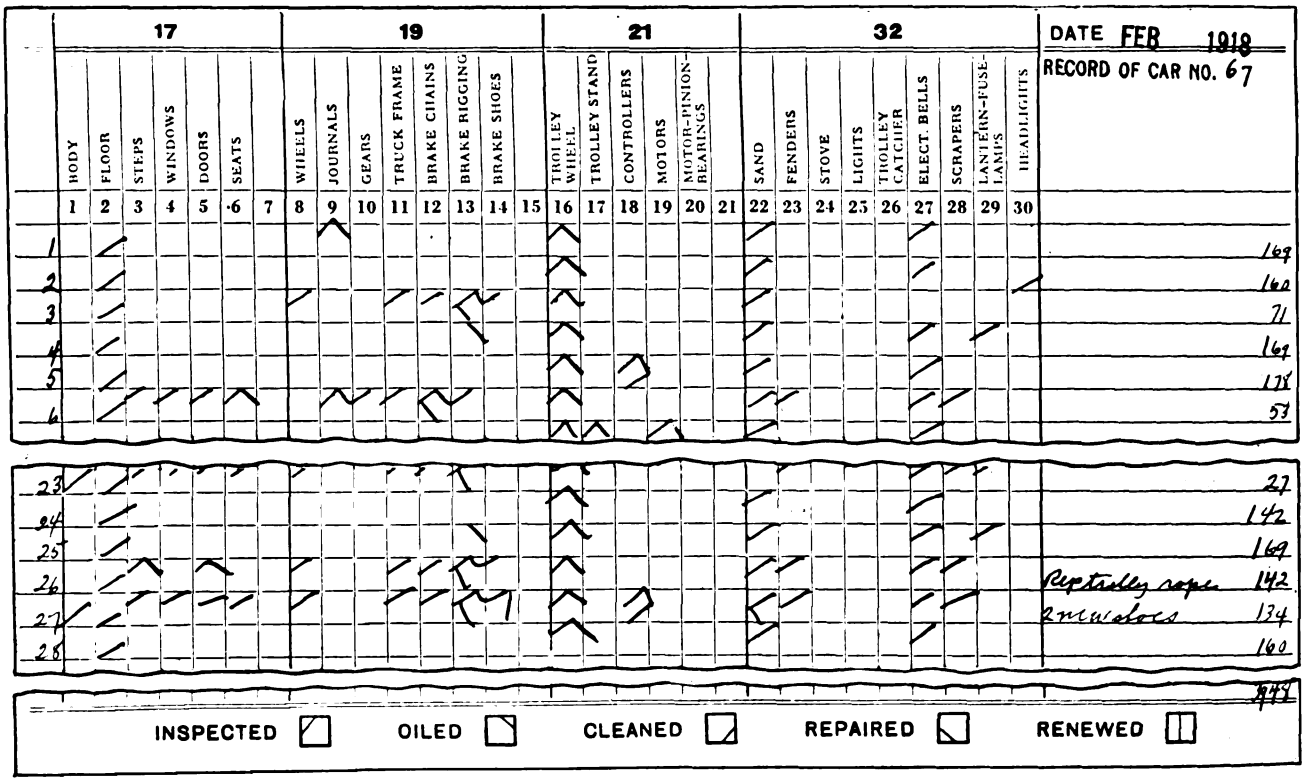
Adequate System of Keeping Inspection Records Used by the Madison (Wis.) Railways Reduces Amount of Writing or Clerical Work to a Minimum and Without Burdening the Files

A VERY simple though adequate system of keeping the inspection records is used by the Madison (Wis.) Railways. The condition of each car is reported by the motorman who brings it in, and this report is checked by the shop foreman. Most of the trouble reported is taken care of by the night foreman, who also arranges to keep the bad-order cars in the shop during the following day, reporting their condition to the master mechanic. Outside of bad-order reports, the cars are taken in for inspection, adjustment or overhaul in rotation, depending on the mileage operated and the lapse of time since the last inspection. The period of inspection is left to the discretion of the master mechanic, who has full knowledge of every condition.

Owing to the small size of the shop the company does not make use of a printed form of shop order, the master mechanic simply making a pencil report of cars to be inspected and for what cause.

The record system on the inspection work is kept on a 9¾-in. x 11-in. card having the divisions of the inspection work printed across the top of the card, together with the account numbers for the several groups, and a key to the inspection record marking at the bottom. Any work done on any car, whether by order or not, is recorded on one of these cards, opposite the car number written in the column at the left-hand margin. A card made up in this manner, with the numbers of all of the cars on which work has been done appearing in the left-hand column, is used each day and turned in to the master mechanic. This record of work done on all cars for the day is then transcribed in the office on an identical card made out individually for each car for the permanent record file. On this the numbers 1 to 30, representing the days of the month, are written in the left-hand column instead of car numbers.

Each card as made up in the form reproduced herewith thus shows at a glance the inspection record for the month of a certain car, the number of which appears in the upper right-hand corner. Thus by inserting in the left-hand column the numbers of cars on which work is done, or the days of the month, the card becomes a record of the inspection for the day on all cars or the inspection for the month on one car. The simple straight-mark system for recording the kind of inspection done reduces the amount of writing or clerical work for the shop man to the minimum. The monthly record for each car gives a sufficiently complete record without too much clerical work and without burdening the files.



17: 1 BODY, 2 FLOOR, 3 STEPS, 4 WINDOWS, 5 DOORS, 6 SEATS, 7

19: 8 WHEELS, 9 JOURNALS, 10 GEARS, 11 TRUCK FRAME, 12 BRAKE CHAINS, 13 BRAKE RIGGING, 14 BRAKE SHOES, 15

21: 16 TROLLEY WHEEL, 17 TROLLEY STAND, 18 CONTROLLERS, 19 MOTORS, 20 MOTOR-PINION-BEARINGS, 21

32: 22 SAND, 23 FENDERS, 24 STOVE, 25 LIGHTS, 26 TROLLEY CATCHER, 27 ELECT. BELLS, 28 SCRAPERS, 29 LANTERN-FUSE-LAMPS, 30 HEADLIGHTS

DATE FEB 1918

RECORD OF CAR NO. 67

1 — 169
2 — 160
3 — 71
4 — 169
5 — 178
6 — 53
23 — 27
24 — 142
25 — 169
26 — Rep trolley rope 142
27 — 2 new shoes 134
28 — 160

INSPECTED ◸ OILED ◹ CLEANED ◿ REPAIRED ◺ RENEWED ◫

INSPECTION HISTORY OF ONE CAR FOR ONE MONTH AS KEPT BY MADISON RAILWAYS

New Insulating Varnish

A BLACK insulating varnish, characterized as "General Utility Inco Insulite No. 16," has recently been placed on the market by the International Paint Corporation of St. Louis, Mo. After baking, this varnish produces a hard, semi-flexible, jet-black lustrous coat, possessing a high dielectric strength and electrical resistance, excellent binding and cementing qualities, and practically moisture, acid and alkaline proof. It will air-dry in thin films in from two to four hours at room temperature. When air-dried it produces a semi-gloss black coat more flexible than when baked. It does not, however, have as high dielectric or mechanical strength or as high electrical resistance as when it is baked.

Old Ties Make Good Fence Posts

IN SOME of the recent track reconstruction work in Atlanta it was necessary to take out some old ties, most of which had been gained down by the rail, but were in good condition chemically and physically. Most of these ties have been in the ground for more than twenty years without suffering anything else than physical wear.

Not wishing to scrap good wood like this, it was found that these ties could be made into very good fence posts used for blocking, and these uses have been made of most of the ties removed.

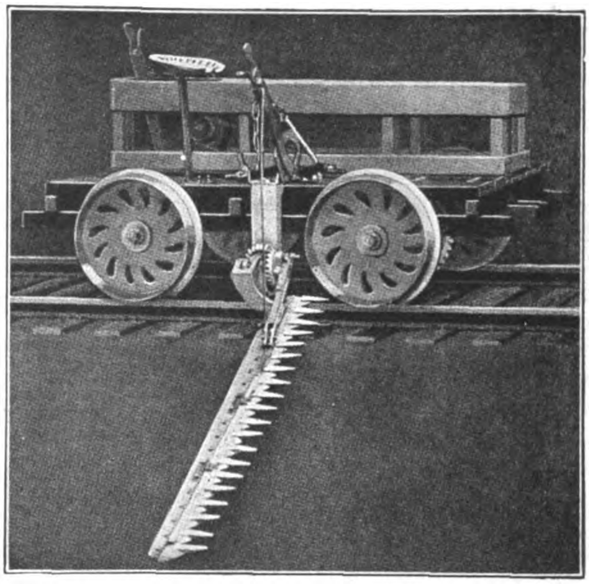
Magnetic Grounding Block

A DEVICE has been developed in England for the purpose of making a good temporary earth or ground connection for track welding and other purposes. It consists of a substantial electro-magnet, provided with carrying handles, the winding being energized with current drawn from the rail. The attraction between the magnet and the rail provides a firm electrical contact between it and the terminal of the electric winding. The device is made by the Equipment & Engineering Company, London.

Mowing the Weeds Along the Tracks

A TRACK mower consisting of an ordinary cutter bar, sickle and driving mechanism which may be attached to any motor, hand or push car and operated by the section men has been placed on the market by the Rawls Machine & Manufacturing Company of Chicago. This mowing device enables the maintenance men to keep the right-of-way well cropped of weeds along either side of the track throughout the summer at a small expense. A cutter bar and sickle from 5 to 7 ft. long is used and is said to negotiate irregularities in the ground without any trouble. The position of the cutter bar is controlled by a hand lever on the car and handled by one man. It is claimed that grass and weeds may be mowed while the car is driven at a speed of 7 or 8 miles per hour. If any obstruction is seen the sickle can be raised to pass over it, and should the obstruction be overlooked there is an automatic feature which protects the sickle from breakage.

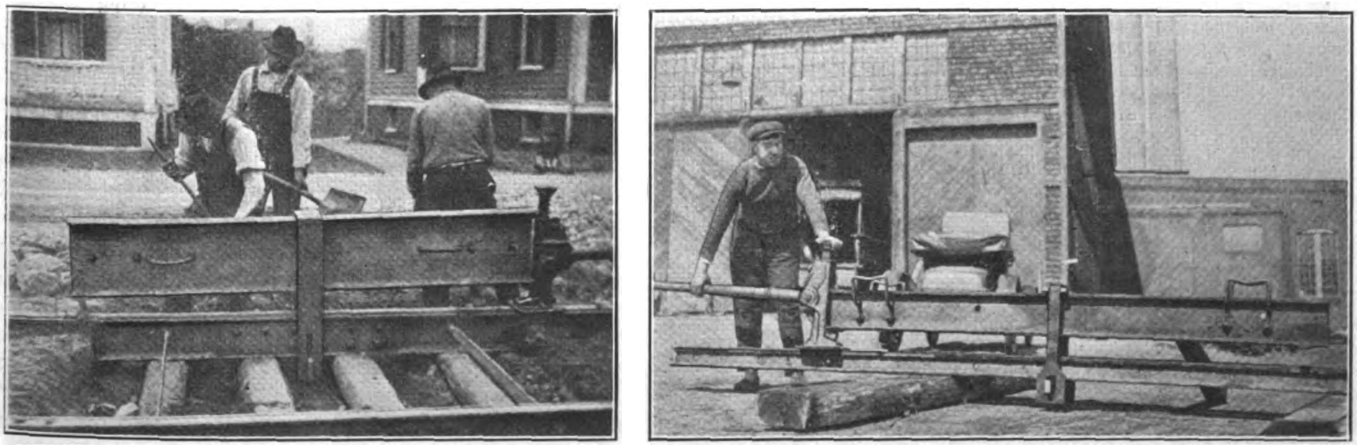
The advantage of this device in sections where the grass and weeds grow rank and high along the side of the track and lop over the rails, making them slippery and dangerous and reducing the normal tractive effort available, is obvious. It is claimed for this track mower that it not only leaves the cut surface smoother than is possible with a hand scythe but it distributes the cut grass and vegetation evenly so that after it has dried the whole surface may be burned over, thus destroying in large measure the stubs and roots beneath and damaging the grass beyond the swathe of the mower.


TRACK MOWER ATTACHED TO SPEEDER

Vertical Rail Benders

AN ACCOUNT was published on page 809 of the issue of this paper for April 30 of the device used by the Eastern Massachusetts Street Railway for bending up the ends of rails at low joints. Two sizes of benders are used. One is made up of a 15-in. I-beam and is used for heavy work, such as with a 9-in. 104-lb. girder rail. The jack used with this bender is of 30 tons capacity, and a line drawing of this bender was given in the article mentioned. In addition the company has a lighter bender, made up of a 9-in. girder rail and used with T-rails up to 75 lb. in weight. This is also a home-made device.

Through the courtesy of Frank B. Walker, engineer maintenance of way of the company, illustrations of both of these benders in use are given herewith.


AT LEFT, FIFTEEN-INCH VERTICAL RAIL BENDER IN USE. AT RIGHT, NINE-INCH RAIL BENDER USED WITH LIGHT RAILS

Association News

Another View of the Coal Situation

J. W. LIEB, Jr., chairman of the fuel supply committee of the Joint Committee of National Utility Associations, which represents the American Gas Association, the National Electric Light Association and American Electric Railway Association, has received from George Otis Smith, Director of the United States Geological Survey, a letter on the coal situation which is of particular interest to electric railway men. Mr. Otis answers certain questions asked by Mr. Lieb, giving the benefit of the Geological Survey's statistical stock-taking as to coal. He urged the importance of stabilizing the coal market, and stated that April 1 data showed the public utilities to be in a strong position regarding stocks of coal. Continuing he wrote, in part, as follows:

At the present rate of consumption the electric utilities canvassed had on hand as of April 1 a supply sufficient for six weeks, six days' operation, and for the coal-gas plants the supply was enough for nine weeks, three days. As to what the public utilities have been doing since April 1 we have no knowledge. It is clear, however, that consumers as a whole have depleted further their reserves. The country is still coasting on its reserves.

Clearly the public utility operator has everything to gain and nothing to lose by continuing to maintain his reserves. It is increasingly plain that the condition of consumers' stocks has a very profound bearing on the coal market. When a man has a large stock he can wait for favorable terms. When his stock is small he has to buy. If something happens to interrupt the orderly flow of coal from mine to place of use he has to buy emergency coal. Now when stocks are generally low a sudden interruption to supply—a blizzard, a switchmen's strike, a traffic jam—finds many consumers unprepared and drives them to enter the spot market. That is the time when a well-stocked coal bin pays for itself. The plant is equipped to withstand a siege.

We do not know enough about stocks as yet to be quite sure what constitutes a safe supply, but if we are willing to learn from experience we can hardly escape the conclusion that a stock of less than 30.000 000 tons is not sufficient to meet a severe winter with business active. The country entered the winters of 1916-17 and 1917-18 with about 28,000,000 tons in storage and in neither winter was the lot of the coal consumer a happy one. Again in the summer of 1920, when stocks fell to 20,000,000 tons, a runaway market developed. On the other hand, in normal times a stock of above 40,000,000 tons seems to be sufficient and it is significant that the coal market did not tranquillize itself in 1920 until the above-ground reserve passed that figure. A difference of ten or fifteen million tons, the margin between a safe reserve and an unsafe reserve, does not appear much; it is no more than a week's production at the maximum rate. In fact, however, this small amount is great enough to change the tone of the market.

There is a sort of critical level of stocks—a critical anchor-ice temperature, to borrow a phrase from hydroelectric operation. Exactly what the critical level is we cannot say until we have been keeping records longer, and of course it would be lower at a time like the present with business depressed and consumption low than in a time of active business. But we can say, I think, that the critical level lies somewhere between 30,000,000 and 40,000,000 tons; and that when stocks are much above that level we have a "buyers' market." Let them fall much below it and we have a "sellers' market."

As to the present level of stocks the Geological Survey's inventory showed that on Jan. 1, 1921, it was not more than 48,000,000 and not less than 42,000,000, say about 45,000,000 tons. By April 1 stocks had dropped to somewhere near 37,000,000 tons, and since then they have doubtless decreased further. In other words, while we can tell from the tone of the market that the critical level has not yet been touched, it is plain that stocks are fast approaching it, and that it would be unwise from the consumer's point of view to let them sink much lower.

The question as to the danger of a congestion of transportation should the public long delay the purchase of coal has been answered by the railroads themselves. If business does not revive and we continue to burn coal only at the present rate there is no reason to fear car shortage; for consumption is much below the pre-war level, and prior to the war our transportation system had no serious difficulty in handling the coal offered, even with the peaks and valleys of seasonal variation in demand. In those days, however, the country needed less than 500,000.000 tons of soft coal a year. Now our requirements, with business reasonably active, are in the neighborhood of 530,000,000 tons. There has been no corresponding growth in the capacity of the railroads to transport coal, and on the three occasions when we have called upon them to haul 550,000,000 tons of soft coal in a single year the carriers have shown signs of distress. In 1917, 1918, and again in 1920, years in which the output of bituminous coal exceeded 550,000,000 tons, the carriers were able to handle the burden only by being relieved from the responsibility of carrying other types of traffic. As Mr. Gutheim. of the American Railway Association, has pointed out, "Our railroad facilities are probably adequate today to handle our necessary annual bituminous output, if produced with fair uniformity of rate throughout the year, and will certainly be adequate when post-war rehabilitation of the properties is completed. Our railroad facilities are not and without great waste of investment never can be adequate to handle currently our necessary bituminous coal production when obtained by weekly peaks of 13,000,000 tons and valleys of 7,500,000 tons in a 12-month period, as has been the case in the past two years." If Mr. Gutheim is right the need for buying early and taking coal while it can be had will be with us for some time.

But what, it may be asked, is the use of a public utility storing coal when other consumers are not? How can the tonnage stored by even all the public utilities stabilize the market if other consumers are holding off and burning up their reserves? The answer is that a reserve is never likely to be needed so much as when other people have none.

To offset this sense of security which comes from a large reserve what can the public utility manager gain by delay? To the layman it would appear that no time could be so favorable to bargain as now, when the coal industry is seeking a market for its output. There are three important elements in the cost of coal laid down at the consumer's door which may conceivably change before long—the wage scale, the freight rate, and the operator's margin. So far as the first two are concerned the purchaser should get the benefit on all coal delivered after the reduction. So far as the third element is concerned the public utility must decide whether the coal man is likely to accept any smaller margin later when demand is active than now when the market is dead.

With adequate stocks, however, the public utility is and will be in a strong position to buy whatever the level of costs and whatever the market position of other consumers. The public utility cannot shut down, and the public must pay for the coal the public utility buys, hence from the public standpoint the double function of large stocks: to keep up service and to keep down prices.

Joint Meeting at Hartford

A SUCCESSFUL meeting of the Connecticut Company section of the American Electric Railway Association was held jointly with the New England Street Railway Club at Hartford on May 18. This was the thirty-ninth monthly meeting. Among the speakers were I. A. May, comptroller the Connecticut Company; E. Irvine Rudd, engineer Connecticut Public Utilities Commission; N. J. Scott, manager Hartford Division Connecticut Company; Edward Dana, president New England Street Railway Club and general manager Boston Elevated; W. J. Flickinger, vice-president Connecticut Section New England Street Railway Club and assistant to the president the Connecticut Company; Richard E. Higgins, chairman Connecticut Public Utilities Commission, and L. S. Storrs, president the Connecticut Company. The general features of the joint meeting were reported fully in the issue of the ELECTRIC RAILWAY JOURNAL for May 21.

Owing to a reduction in printing costs the association office can now supply the booklet "How You Used to Ride" at $7.50 per thousand copies. This is the cost price, and the price may be still further reduced if the demand warrants.

Letters to the Editors

Maintenance Cost on a Car-Weight Basis

BROOKLYN RAPID TRANSIT COMPANY

BROOKLYN, N. Y., May 28, 1921.

To the Editors:

David Harum said "a reasonable amount of fleas is good for a dog"; so a reasonable debate on the effect of car weight on track maintenance may not be out of place. The article by J. C. Thirlwall in the April 16 issue of the JOURNAL and subsequent correspondence has created no little interest among track engineers. In the article in the issue for April 30 Mr. Thirlwall evidently does not differentiate his estimated track maintenance costs between city and interurban properties. There is a wide range in maintenance of tracks in these two situations, and in city tracks where paved about 35 per cent of the maintenance cost is for pavements.

The safety car is used almost exclusively in cities where the tracks are paved. Meanwhile there is a large percentage of the pavement maintenance cost which is due solely to the wear and disintegration of the pavement. These are not caused by the passage of the car, no matter of what type it may be, but are only due to use by public vehicles.

As Mr. Thirlwall says, "engineers will disagree as to the effect of car weight on track maintenance," and I venture to be one of the "disagreers." We do not have sufficient cost data to enable us to determine what it costs to maintain our tracks now, whatever the equipment may be, and I wish to be in opposition to the use of estimates unless the latter have more and better records of actual costs upon which to base estimates of the influence of car weight.

The safety car will continue to sell itself to the railway companies without need for using supposed lessening of track maintenance as an argument. Further, the writer believes that the actual axle load, plus impact, as found with the safety car, does not fall very much below that of other equipment which must be provided for in our tracks and the increase in use of safety cars adds more wheels which pass over the tracks through increased frequency of service. The number of lighter wheel loads, if increased over normal, may do as much total damage to rails and joints as the normal number of heavier loads.

It has also been commonly observed on all older properties which have long used a fairly heavy double-truck car that it is costing a great deal of money to make the "double-truck track" suitable for the single-truck car. A higher degree of maintenance is called for with single-truck cars and is being paid for right now. Until we know just how much it is costing us to maintain a track almost as smooth as a billiard table, we shall be uncertain that the safety car is saving any money on track maintenance.

R. C. CRAM,
Engineer of Surface Roadway.

A Smile and Credit

THE CONNECTICUT COMPANY

NEW HAVEN, CONN., May 24, 1921.

To the Editors:

What a man wants from his grocer during this period of high cost of living is a smile and credit. Also that is exactly what the street railways want.

Hardly a man will deny that what he wants most nowadays anyway is "a smile." Applied to the street railway situation a smile means the good will of the public and no effort should be spared by officers or by employees in obtaining this good will. It is the most valuable asset a street railway can have and by a proper education of the conductors and motormen the good-will account can be increased to a large extent. One harsh word by a conductor may perhaps make an enemy of one of the road's best customers and booster. A good illustration is given in the following:

> "A BANK TELLER'S UNRULY TONGUE"
>
> An old and shabbily dressed man in the line at the receiving teller's window of a certain Chicago bank fumbled for some papers.
>
> "For heaven's sake, hurry up!" snapped the teller.
>
> The old man's eyes flared, he emitted a grunt of anger and left the line without making a deposit.
>
> Twenty minutes later the teller was called into the cashier's office and told his services would be required no longer than the end of the week. He asked for an explanation and got it. The old fellow in the shabby clothes happened to be the head of one of the largest lumber companies in the Middle West—an organization that kept all of its checking accounts in that bank. He had dropped in to make a deposit and open a personal checking account. The amount he intended to deposit was large—the annual dividends from several of his organizations!
>
> After his discourteous treatment by the teller, he had gone to the cashier, and not only refused to have his personal account in the bank, but he had hinted also that his lumber company might withdraw its balance from the bank. The cashier was forced to rid the bank of an undesirable employee who had let his frosty tongue spoil all of his other desirable qualities from the point of view of that banking establishment. HARRY BOTSFORD, in *Leslie's*.

As for credit, the street railway officials have also forgotten what the word means, but the future is bright and I believe the public begins to realize that it cannot do without the street railways and that it will help to restore credit and thus give a new lease of life to the transportation systems of the country.

With the relief being granted by many legislatures from the unfair burdens of the past and with the riding public paying just fares, the street railways will be restored to a proper credit basis and will give the riding public the service it requires. Let's all vote for a Smile and Credit.

I. A. MAY, Comptroller.

Membership List of International Railway Association

THE International Railway Association, formerly the International Railway Congress, an international organization of steam railroads, has just issued a pamphlet giving a list of members, program for the Rome meeting to be held April 18 to May 1, 1922, index of topics discussed since the association was organized and a brief résumé of recent events.

Recent Happenings in Great Britain

All England Has Been Organized on War-Time Basis to Combat Domination by Coal Miners

(From Our Regular Correspondent)

Unfortunately for the industrial peace in this country, there is a body calling itself the triple alliance. It is a combine for common action of three national trade unions or federations of trade unions, namely, coal miners, railway men and transport workers (the latter including all sorts of transport employees except railway men). The transport workers thus embrace all tramway and omnibus employees, drivers of automobile and horse commercial vehicles, etc., but in this country the word railway does not include street tramway.

EARLY in the present year Parliament, at the instance of the Government, passed an act abolishing all state control of coal mining industry, which had been in operation since the beginning of the war and which otherwise would have continued until Aug. 31. The inflated wages of the miners under state control had to go, and when the mine owners issued new scales of wages, reduced to put the industry on an economic basis—the Government subsidiary being removed—the miners struck in the beginning of April and demanded a national wage board and a national pool of profits so that miners in all districts, rich and poor, would be paid at the same rate.

This action was resisted both by the owners and the Government, but the miners hoped to get the other two sections of the triple alliance to go on strike in sympathy. They announced that they would strike, but at the last minute, on April 15, the two affiliated bodies determined that their men should remain at work. The reasons advanced were that the miners had got a good offer for negotiation, and that the rank and file of railway men and transport workers would in a large proportion of cases refuse to go on strike.

NATIONAL STRIKE AVERTED

Something like a national strike was thus averted. The Government had all preparations made for carrying on transport by road, and the army reserves were called out and a defense force organized for maintaining order. Large bodies of tramway men in different parts of the country had resolved to join in the strike before the counter-order from the transport workers' executive was issued.

During April prolonged negotiations went on between the Government, mine owners, and the miners, and the Government offered a subsidiary of £10,000,000 to help to keep wages up during the ensuing four months of transition. The miners, however, refused all offers, and simply adhered to the demand for a national pool of profits, meaning nationalization. As Parliament had already decided against nationalization the Government persisted in refusing the miners' demand, which was now generally recognized as a political one and having nothing to do with wages.

At the end of April, accordingly, all negotiations were broken off, and the nation settled down to a struggle of endurance. War conditions of economy were restored. Manufacturing industries were largely shut down for lack of coal, unemployment went up by leaps and bounds, and railway and tramway services underwent a series of successive curtailments. The Government, however, arranged that all public utility services should have a preference in the matter of coal supplies. For domestic purposes coal was rationed and supplies frequently cut off.

With the month of May the reductions in public services continued. Further trouble arose when the executives of transport workers and of the railway men issued orders that the members of these bodies were not to handle imported coal, which was now arriving in considerable quantities. Volunteers and non-union labor were engaged for the work. Meanwhile an important step was taken at several electric generating stations in the country; namely, the adopting of furnaces for oil burning. This was notably the case at Chelsea, the biggest traction power station in the country, which supplies power for the London underground railways. There twenty-four out of the sixty boilers were converted so as to begin operation with oil fuel in the middle of May. Fuel oil supplies are reported to be plentiful, and the change is likely to be permanent.

While town councils in Great Britain have for many years been authorized to own and work tramways and do so in all the large and in some of the smaller towns county councils have not been granted the same privilege. In only comparatively few cases, indeed, is there a field for county councils in this direction, owing to sparseness of population in rural areas and owing to town councils being empowered to operate beyond their boundaries where suburban or interurban population is very dense.

In this connection the London County Council, which works tramways, is a case by itself, for the county of London—all urban—is only a county for certain general administrative purposes. Some years ago the Middlesex and the Hertfordshire County Councils were authorized to construct tramways, but these were leased for operation to a private company. This spring a bold bid for a new departure was made by Durham County Council which applied to Parliament for power to build and work 27 miles of interurban tramways in the county, to provide and work trackless trolley vehicles on 60 miles of route, and to run omnibuses on any road in the county. The cost of construction and equipment was to be about £1,700,000.

Objection was raised to the establishment of this precedent and to the heavy capital expenditure by a local authority at the present time. It was also maintained that financial loss would result which would have to be met by the ratepayers, and that the scheme was superfluous because private enterprise already provided omnibus services over all except 4 miles of the routes covered by the scheme. Competition with the North Eastern Railway, which pays 12½ per cent of the whole county rates, was also urged. When the bill came before the House of Commons on April 14 it was after discussion rejected by 112 votes against 46.

L. C. C. TRAMWAYS BEHIND

No more disastrous example of the result of high wages and high cost of materials in this country can be found than the case of the London County Council Tramways. The working of the undertaking, which carries more passengers than any other tramway system in this country, resulted in a loss for the financial year ended March 31 last of no less than £540,000. The expenditure debited includes some capital charges, but only half the cost of renewals. Even before the war the system was never a great financial success, largely because of the heavy capital charges for interest and sinking fund on the high cost of the conduit system which for the most part is used. The last increase of fares has greatly increased the receipts, but the higher revenue has proved quite inadequate to meet the growing expenses. The ratepayers are to be charged 1d. in £1 to help to meet the deficiency.

Arthur Watson, general manager of the London & North Western and the Lancashire & Yorkshire Railway Companies, lecturing to the Manchester Statistical Society in April, put forward the view of the most useful development in the methods of transportation would be the electrification of the railways. Restrictive legislation had, however, been passed to such an extent as to interfere with the fundamental principle on which the railway system had been organized; namely, that they were commercial undertakings. Unless reasonable dividends were realized railway enterprise must come to a standstill. Without such dividends it would be impossible to contemplate a large expenditure on the electrification of lines. The capacity of the railways would be enormously increased by the use of electric traction. The country was on the threshold of great electrical development, and the electrification of railways would give a great stimulus to a national system of electrical power production. These opinions of Mr. Watson are quoted as being of special importance, seeing that he is manager of a great railway undertaking.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Publicity Effective

St. Louis Road Succeeds in Driving Home Need for More Liberal Treatment

Publicity relating to the financial problems of the United Railways, St. Louis, Mo., is bearing fruit. Civic organizations in five suburban subdivisions of the city will go before the Missouri Public Service Commission and request that the receiver be permitted to charge an 8-cent fare instead of a 7-cent fare, in order that credit shall be restored and funds obtained to extend several lines.

A recent statement of Receiver Wells made an impression. He said that the fare reduction last year from 8 cents cash, or two tokens on the cars for 15 cents, seven tokens for 50 cents or 50 for $3.50 at drug stores to a flat 7-cent fare meant an actual reduction of only 37/100 of a cent in fare and yet caused a falling off of about $3,000 a day in the receipts.

To various bodies of citizens clamoring for extensions of service the receiver has made it plain that the only way to get improvements is to increase the revenue and insure a surplus instead of a deficit. The first three months of this year showed earnings of about $200,000 less than enough to pay interest charges and operating expenses. Travel has increased slightly the last two months, but the receiver says that if wages are not cut after June 1, when the present contract with the trainmen expires, an increased fare will be necessary.

Conferences are in progress between the men's union and the management over the proposed new wage contract. Motormen and conductors now are getting 55 cents an hour the first six months, 60 cents thereafter until the end of the second year, and 65 cents an hour after two years, with time and a half for overtime based on a nine-hour day. A special effort will be made to modify the working conditions which the management considers a hardship.

The Missouri Supreme Court recently denied the application of the receiver for a mandamus to compel the State Public Service Commission to arbitrate a wage dispute. This arose in the case of the shopmen, electricians, printers and others not belonging to the carmen's union. The court held it was optional with the commission as to whether they should serve as arbitrators. The commission had refused to act in the matter of the shopmen, and whether they will refuse again in case the carmen's claims go to arbitration is not yet known definitely.

In the meantime the receiver and the manager, Col. A. T. Perkins, have met with various civic organizations to explain the situation, and one of the results is the decision by some of these bodies to support rather than oppose an expected application for increased fare. In one of his statements Receiver Wells brought out the new thought that under the changed condition of utility regulation the users of public utilities must be prepared to pay full value for service.

Threatened Strike Postponed

No agreement regarding wages had been reached on May 31 by trainmen and the Pennsylvania-Ohio Electric Company, Youngstown Municipal Railway and associated companies at Youngstown, Ohio. On that day at midnight the agreement expired, but operation of cars will continue and negotiations proceed at least for a day or two longer. The expiring scale is 60 cents for the first three months, 63 cents for the next nine months and 68 cents thereafter. The company originally offered 45, 48 and 50 cents, and the men after several weeks of negotiations offered to take 52, 55 and 60 cents. The company subsequently proposed a scale calling for 46, 50 and 53 cents. This was the status on May 31.

Utility Act May Strike Snag

The lower house of the Illinois State Legislature on May 25 approved the new public utilities act by a vote of 100 to 23. The bill struck a snag, however, when it was sent to the Senate and a warm fight is promised before its fate is determined.

The proposed law changes the name of the regulating body to "Illinois Commerce Commission." If it passes, the five commissioners on the present body will be succeeded by seven commissioners and eight assistant commissioners, to be appointed by the Governor for a term of four years.

It is said that the bill would remove all civil service safeguards. Communities would have the right to remove themselves from the jurisdiction of the commission and adopt home rule by public referendum. The proposed act has been denounced by various interests including the Western Society of Engineers.

A resolution has been introduced in the Legislature requesting the Governor to prevail on the commission to force a return of the 5-cent fare on the Chicago surface lines. It has been said that this is not favored by Mayor Thompson of Chicago who is looking for the approval of his plan for people's ownership of the traction lines and a 5-cent fare supported by tax provisions.

Des Moines Service Cut

Last Hour Struggle by Business Interests of the City to Preserve Railway to the Community

Following authority granted by Federal Judge Martin J. Wade the General Electric Company, which holds claims against the railway for material supplied, has started removing its equipment from the substations of the Des Moines City Railway with the result that on May 23 the railway officials were forced to cut service 62 per cent of what has been given during the last three months.

As a result the company operated only forty-nine cars from Monday night until Saturday morning when seventeen more cars were placed in service bringing the service up to what was approximately 50 per cent of normal.

Business interests of the city held meetings during the week to discuss ways and means of bringing about a settlement of the railway difficulties. The Greater Des Moines Committee and the Chamber of Commerce appointed a committee to draw a service-at-cost franchise which it is hoped will serve as a basis of bringing about a settlement of the trouble. This committee has since called into conference Judge W. E. Miller, the newly appointed Corporation Counsel to assist it.

Hope is entertained by members of the two organizations fostering the new franchise proposal that if a favorable franchise can be secured arrangements may be made between the Des Moines City Railway and the General Electric Company which will permit the substation to be restored.

F. C. Chambers, operating receiver, and J. G. Gamble, attorney for the railway, have been in Chicago conferring with the Harris interests relative to foreclosure of the mortgage.

According to a Des Moines newspaper the McKinley interests of Illinois, operating the Des Moines Electric Company, have made a proposition for the purchase of the Des Moines plant.

The statement for April filed with the City Council by the railway shows that the company lost $35,000, a considerable increase over March.

Pending the settlement of the curtailment in the service, negotiations between the company and its union employees over the wage question are at a standstill. As yet the two arbiters chosen by the company and the men have been unable to agree upon a third man. A week ago they settled upon Judge F. F. Faville, of the Iowa Supreme Court, but he was forced to decline. Sidney Mandlebaum was later agreed upon for the third man, but he, too, refused to serve.

Four Months' Labor Battle

Railway at Albany Refuses to Compromise a Strike Issue that It Considers Clear Cut

Renewed attention has been directed to the strike of the employees of the United Traction Company, Albany, N. Y., by the recent disorder there, after a period of comparative quiet. The strike was declared on Jan. 28. The economic readjustment had not yet fully set in at the time, and the men, loath to accept a wage cut, decided to go out in a test of strength in contravention of their contract. In consequence Albany and the entire surrounding communities were thrown into turmoil.

THE pay of the men was increased last July from 45 cents to 60 cents an hour to continue to June 30, 1921, provided the company was allowed the right by the Public Service Commission to increase its rate of fare before Nov. 1, 1920, from 7 cents to 10 cents. The commission did not act upon the application until January, when it granted an increase of fare in Albany from 7 to 8 cents and ordered a decrease in fare in accordance with city franchises in Troy and Rensselaer. The company claims that the net result of the order was an actual reduction in revenue and that it was forced to put the men back on the 45 cents an hour pay to prevent bankruptcy. The company officials insist that the men understood that would be done under the provision in the contract that a general increase in fare be granted before Nov. 1 as a condition for a continuance of the 60 cents an hour pay.

Shortly after the declaration of the strike the company claimed:

1. That under the conditions of operation, wages, prices of material, and rates of fare, it had in six years sustained a loss of $923,522.
2. That under the decision of the Public Service Commission, effective on Jan. 29, 1921, it estimated its loss for one year, if the rates of pay for motormen were continued at 60 cents an hour (others in proportion), would be $743,974, and that at the rate of pay of 45 cents an hour, the proposed new rate, its loss for one year would be $229,096.
3. That the contract between the company and the Amalgamated Association, so far as it covered wages, was ended as of Nov. 1, by the findings in the decision of the Public Service Commission.

Neither the first nor the second of these statements was ever challenged. With respect to the third statement, the Public Service Commission itself said:

> That contract (of July 1, 1920,) fixed the wages until Nov. 1, 1920, "with the understanding that said rates of wages are to continue until June 30, 1921, provided the company is granted permission to charge increased rates on or before Nov. 1, 1920." No such permission has been granted, so that there is now no contract covering wages.

The men stuck to their guns, so to speak. Through Supreme Court Justice Howard an order was secured directing that the issues, raised in the application of the union for an order directing the company to proceed to arbitrate the differences, be submitted to a jury. This order was reversed by the Appellate Division, Third Department, on May 17. The decision dismissed the entire proceedings and held that the striking carmen had no claim to arbitration under the contract involved except as to wages for the year beginning June 30 next. The court also held that the members of the unions "abandoned the contract and committed an anticipatory break of the provision for arbitration by destroying its consideration before it had an opportunity to come into operation." Said the court:

> When, on Jan. 28, 1921, the employees of the Traction Company, members of the petitioners' unincorporated association, left their employment, leaving the traction company incapable of immediate performance of its obligations to the public, they committed a breach of the contract, and if there had been a valid agreement for an arbitration of all controversies, they would have relieved the traction company of the obligation to perform. . . . The provision for arbitration is limited. . . . This agreement relates wholly to an adjustment of wages for a period succeeding the term of the contract (June 30, 1921). . . . There was no provision in the contract that the traction company would arbitrate any dispute over wages arising in January, 1921. . . . The election on the part of the employees to abandon their employment in disregard of the contract made in their behalf by the petitioners could not impose an obligation which was not provided in the contract.

Meanwhile the struggle settled down to a real test of strength between the company and its former employees. All the various angles of the ordinary strike entered the controversy, only they became more pronounced as time went on. Even political factions split over the labor issue. Jitneys and omnibuses then poured into Albany, Rensselaer, Troy Cohoes and Watervliet, the five principal cities in which the company operates, and did a rushing business.

For a long time they provided nearly all of the transportation facilities of the entire section and were the cause not only of a long legal fight but of the break in the Republican organization. William Barnes, the Albany County Republican leader, at a Republican dinner in February, urged the public to support the company. He said that it could not continue to pay the increased wages of the men because of its financial condition and that it was to the best interest of the employees to accept the reduction and the public to prevent the company from going into bankruptcy.

Pressure was brought to bear on Mayor James R. Watt to get him to order the jitneys out of business. He refused. The company then secured a mandamus order from Supreme Court Justice Harold J. Hinman directing him to stop the jitneys from running on the ground that they violated the law prohibiting buses from operating on the same streets with trolley lines. That order was upheld by the Appellate Division, and the police began arresting all jitney drivers and bus owners who were not licensed to run. Out of these arrests grew the recent disorders that at one time apparently threatened to get beyond the bounds of the local police and the State Constabulary to deal with them. Until the issuance of the order forbidding jitneys to carry the people who did not want to ride on the trolleys the strikers and their sympathizers seemingly were content to allow the contest to drag along in the hope that the company might submit or compromise.

The position of the company is that had the questions at issue been dispassionately stated by such a tribunal as the Industrial Commission, had there been a vote thereon with the security and secrecy of the Australian ballot, with an honest count under disinterested authorities, three-quarters, or even one-half, of its former employees would have been found willing to "perform their labor" until the end of June, 1921.

In order that the attitude of the company on the matter might be definitely known, a letter was mailed to each former employee on March 24, last, advising that the company would receive individual applications and that such men as were considered competent and desirable would be employed, with the understanding that the seniority-rights of such employees would begin on the day their applications were accepted; that applications from former employees for their old jobs would be received on and after that date until further notice.

This offer has never been rescinded and is still open to former employees to the extent only however as to such positions as are now vacant as in no event will the men now permanently employed be removed without just cause.

Florida Road Praised

"A Country Banker," writing in the *Saturday Evening Post* for May 21 about his experiences in Florida and elsewhere, said:

> The first time I came here, four years ago, the street-car service was in a poor way—cars old and dirty and with a general air of dilapidation. It was owned by a corporation, and that corporation was owned by another corporation. The car line went into bankruptcy and things got worse instead of better, until finally the city took over the plant. It evidently picked out a capable man for manager, and bought new cars throughout, clean and smart-looking and of a type better adapted to traffic conditions here than the old cars had ever been. It rearranged schedules and put the plant in good shape. And now, although it charges only a 5-cent fare, it is making a quite satisfactory showing, and they are laying out some extensions.
>
> Of course I don't know how much of a return on the capital investment a rigid system of bookkeeping would show. But as the city has to provide transportation for a population of 60,000 in winter and only 20,000 in summer the public officials probably figure that a good street-car service which will pay its way is a good investment for the town. The city also operates a gas plant to the general satisfaction of everybody concerned.
>
> The point is that here is an example of successful politics. The city not only performs the usual functions of a city satisfactorily, but also runs a gas plant and a street-car system very satisfactorily.

The city to which he refers is presumably St. Petersburg.

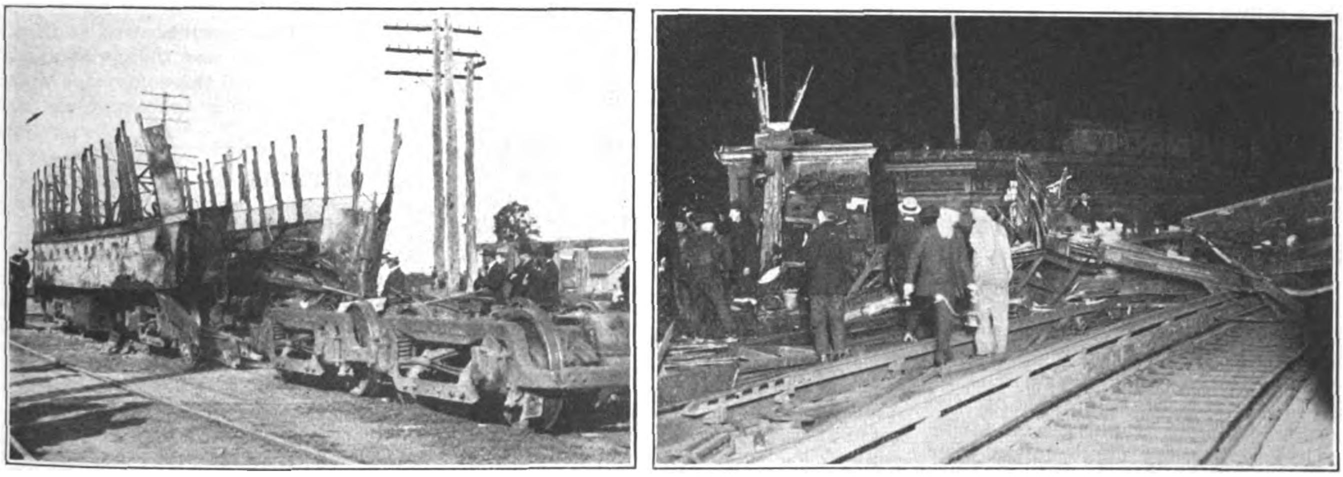
Basis Found for New Orleans Negotiations

C. C. Chappelle, representing the Eastern security holders of the New Orleans Railway & Light Company, New Orleans, La., attended the meeting of the Commission Council on May 25 and submitted his promised scheme of reorganization. Several features of the plan won commendation. It is too much of course to expect that any plan would be acceptable in toto on presentation.

The plan advanced by Mr. Chappelle accepts the rate base valuation of the citizens' advisory committee and assumes $44,700,000 as a fair valuation of the property for rate-making purposes. As opposed to this there are outstanding capital liabilities of $71,000,000. The plan provides for an 8 per cent return. Mr. Chappelle argued that this rate of return was essential to secure new capital. Moreover the holders of the senior securities would have to be compensated to relinquish their position of priority. All of the common stock and virtually all of the preferred stock would be wiped out if the plan submitted were followed. It would probably take $11,500,000 new money to put the company in shape including the sum needed immediately for rehabilitation.

There would be a new company, under a new name, financed largely in New Orleans with a New Orleans man as executive head, and operations to be regulated by the city, with possible representation of the city upon the board of directors.

A scale of rates, to be reduced as the cost of labor, fuel and materials comes down, was promised by Mr. Chappelle.



LEFT—REMAINS OF CAR IN NEW JERSEY WRECK. RIGHT—DEBRIS SHOWING NEW YORK MISHAP

Wage Contract at London Readjusted

The difficulties between the London (Ont.) Street Railway and its employees have been settled by compromise, and a new agreement has been signed. The men asked for an increase in wages from 48 to 52 cents an hour and a yearly agreement. The company refused the wage increase and proposed an agreement which could be ended by either party on thirty days' notice. The employees finally agreed to remain at work for 48 cents an hour, the old scale, with a yearly agreement the wage clause of which can be terminated on sixty days' notice.

The Ontario Railway & Municipal Board operated the railway for a year, but gave up control on April 30 last, after proving that at the present rate of fares—nine limited and seven unlimited tickets for a quarter—the company cannot meet its obligations, one of which is to pave its share of streets traversed by its lines.

Excursionists Meet with Accidents

About fifty people were injured, a few fatally perhaps, on May 30 when a Pennsylvania freight train crashed into a fast car of the Indianapolis, Columbus & Southern Traction Company, known as the Dixie Flyer, at Edinburg, Ind., where the tracks intersect.

Two Public Service Railway cars collided near Roebling, N. J., on May 30, killing one man and injuring about 100 persons. The wreckage took fire. Misunderstanding of orders is believed to have been the cause.

Between fifteen and twenty persons were injured on May 30 in New York City when a Third Avenue Elevated Railroad train bound north with passengers from Staten Island and Brooklyn jumped the track at Westchester and Third Avenues near 149th Street. The first car became uncoupled from the second and went up Westchester Avenue, turning half-way around at Bergen Avenue and blocking north and south-bound tracks. The other cars of the train continued up Third Avenue and smashed a signal tower. When these cars finally came to a stop the second car was left overhanging the elevated structure.

A representative of the Interborough Rapid Transit Company said that the derailing was due to man failure on the part of the motorman. At the point where the wreck occurred there is a spur which connects the elevated road with the subway.

Service-at-Cost Agitation Renewed

Operation at service-at-cost for the Dallas (Tex.) Railway has again come to the fore as the new administration of Dallas, which took office on May 2, is considering reopening the question. This issue was one of the chief points on which the recent city campaign was waged.

M. N. Baker, the first supervisor of public utilities under the traction franchise granted to the Strickland-Hobson interests in 1917, has contributed an important chapter in this discussion in a letter written to Lynn B. Milam, who served as supervisor of public utilities under the administration of Mayor Frank Wozencraft. Mr. Baker strongly commends the stand taken by Mr. Milam in favor of the service-at-cost plan, and declares that in such a franchise alone can the city of Dallas expect to find solution for the many problems confronted in the management and supervision of the city's utilities. Mr. Baker also makes reply to the objections to the service-at-cost plan voiced by Mayor Sawnie Aldredge.

Mr. Baker's letter to Mr. Milam follows in part:

> Mr. Aldredge's fears that the supervisory forces of the city will not be able to determine the proper costs are entirely without foundation, as I know, from experience, that the determination of all facts controlling the operation of the railway is a matter which any business man with proper accounting and engineering advice can easily ascertain. There is nothing illusory about the accounting methods of utilities, and with the supervisory powers of the city properly administered the exact status of all revenues and expenses can easily be arrived at.
>
> But, aside from all this, the immediate necessities of the city with reference to improved facilities and extensions of service require that a definite program be developed by any set of city officials who may hold office. It is evident at the present time that transportation development is at a standstill in our city, and that the present franchise, with its limitation of a 5-cent fare, regardless of the cost of operation, has utterly failed and gives no promise for the future.

Of particular interest in this connection are the plans which have been submitted to the city officials of Dallas by the Dallas Railway for the ultimate development of a system of lines touching every part of the city and affording transportation to the maximum number of citizens. These plans were submitted in connection with the company's application for charter changes, which include the service-at-cost plan of operation with a guaranteed return of 7 per cent on the agreed valuation of property involved in the operation of cars.

In the ultimate development plan numerous changes are contemplated in the existing lines by taking up portions of certain lines and the laying of new lines on other streets. It is proposed to spend $2,000,000 for improvements within the next five years. A complete map of the city showing all changes proposed has been prepared under Mr. Meriwether's direction and has been presented to Mr. Everman for use of the city in studying the proposed changes.

Power Plant Men Strike in Cincinnati

Plants furnishing power for the Cincinnati (Ohio) Street Railway inclines shut down at 11 p.m. on May 31 when twenty-nine stationary engineers employed by the Ohio Traction Company quit their jobs and walked out. Other power plants supplying current for street railway operation were kept going by men who took the strikers' places. Service will probably be curtailed until the strike is settled, but the public may be sure of day transportation at least.

As for owl service, officials of the company would make no definite promises, saying merely that they "expected to keep the cars going and would do the best we can."

The walk-out followed notice served on officials of the traction company at 10:30 a.m. on Tuesday by Charles B. Manwood, business manager of Stationary Engineers Union, Local No. 18, that all engineers employed by the traction company would go on strike at 11 p.m. Tuesday night unless their wage demands for the coming year were met before that time.

A verbal agreement has existed between the company and the union whereby the men have been receiving 90 cents an hour for the last year. The walkout followed refusal of the traction company to renew the agreement and a suggestion on the part of the company of a cut in wages for the engineers.

W. Kesley Schoepf, president of the railway, and Walter Draper, first vice-president, said that officials of the company met with union representatives on Monday morning in an effort to reach some agreement. They said that the engineers refused to accept the offered wages of 65 and 70 cents an hour, declined an invitation to make a counter proposal entailing any reduction in the wage now paid and turned down all offers on the part of the railway to submit the dispute to arbitration.

Mr. Draper said that the main power houses of the company would be operated regularly and that operation of the inclines would be resumed as soon as the company is sure that it has enough men for the purpose.

Strike Averted in Michigan

Throughout the final days of May continuous efforts were made to reach an adjustment of the wage differences between the employees of the Michigan United Railway and the company, and half an hour before the time set for a strike the controversy was amicably settled with the wage cut as the only new feature of the agreement. During the negotiations it was stated that the wage reduction was to come at the conclusion of the wage agreement which guaranteed a wage scale to last until June 1.

Mayor Frank T. Bennett of Jackson led in the attempts which were made to settle the differences amicably. He at one time obtained a promise from the employees to delay action until members of the Chamber of Commerce had had an opportunity to discuss the question with them.

News Notes

Minnesota Roads All Under State.—All electric railways in Minnesota are now under state control as to rates. Franchises have been surrendered by the Minneapolis & St. Paul Suburban Railway granted by the cities and villages it serves. This is the last company to take advantage of the new law passed by the recent Legislature.

Wage Cut Rejected.—Conductors and motormen at Evansville, Ind., have voted to reject the orders of the company for a wage reduction of 9 cents an hour proposed a few days ago by the head of the Southern Indiana Gas & Electric Light Company. The men are still at work. The scale paid to the men is from 45 to 50 cents an hour on the city lines, and 52 cents an hour for men on the interurban cars, and 54 cents an hour for men working the one-man cars.

Service-at-Cost Suggested at Vancouver.—An agreement is now under consideration by the City Council of Vancouver, B. C., by which the British Columbia Electric Railway would give service at cost, selling four tickets for 25 cents, charges for electric light and gas to remain as at present, and be allowed 6 per cent interest on investments made in the past, and 8 per cent on future investments. At present tickets sell for six for 35 cents; the change would mean an increase of 5 cents for every twelve tickets. Blundell Brown, one of the directors of the company, is at Vancouver from London, England, and is understood to be bending his efforts to inducing the city of Vancouver to take over the system when the franchise expires.

Wages Reduced in Johnstown.—General Manager Shannon of the Johnstown (Pa.) Traction Company has announced a reduction of 5 cents an hour in the wages of the employees. The reduction, effective May 22, affects 450 men.

Buffalo May Have Buses.—The International Railway, Buffalo, N. Y., is considering the advisability of running a bus line in Bailey Avenue until such time as it would be justified financially in laying tracks. The company was granted a franchise to lay tracks and operate cars through the street some years ago, but the time limit has expired.

Wage Reduction Suggested.—Trainmen of the Connecticut Company, New Haven, Conn., all over the State held special meetings during the week ended June 4 for the purpose of hearing the report of their wage committee, which has recently been in conference with officers of the railway. While no official statement is forthcoming, it is understood that the committee will report to its constituents that the company refuses to entertain the proposal to increase wages 25 per cent and in reply counters with a proposal to cut wages 15 per cent. The members of the union will be asked to express their views and issue instructions to the committee with respect to the policy to pursue in the future.

Programs of Meetings

American Railway Association

A business session on June 15 and 16, at the Hotel Drake, Chicago, has been proposed by the general committee of the mechanical division of the American Railway Association instead of the convention that has usually been held at Atlantic City, N. J. The reports of standing and special committees have been considerably modified on account of the limited time allowed for the proposed June session. Reports will be received on the following subjects: "Prices for Labor and Materials," "Car Construction," "Loading Rules," "Brake Shoe and Brake Beam Equipment," "Train Brake and Signal Equipment," "Specifications and Tests for Materials," "Tank Cars," and "Standard Methods of Packing Journal Boxes."

Signal Section—A. R. A.

The annual meeting of the Signal Section, American Railway Association, is to be held at Chicago on June 6, 7 and 8. Committee X presents a report on the requisites of signal locations for automatic block signals. This committee, among other things, will report on automatic train control, and on a proposed short code of requisites for light signals. Committee IV will present a code of instructions for making torque tests of power-operated signals, and a drawing of torque testing apparatus. Committee XV on valuation, J. M. Carley, chairman, will present a report of a dozen pages giving the result of studies in valuation details made by several sub-committees.

Financial and Corporate

Twelve Large Companies Compared

Gross Earnings Increase 17 per Cent, but Expenses 22 per Cent and Operating Ratio 4 per Cent

In the April 16 issue of ELECTRIC RAILWAY JOURNAL, figures from the bureau of information of the American Electric Railway Association were given to show comparative results in 1920 and 1919 from a total of 127 electric railways. Of this total seventy-two were city companies and their gross income exceeded $233,000,000 in the past calendar year.

An additional interesting comparison may be made with the data from twelve of the largest city properties, the identity of which cannot be made known. These same properties were considered in a review published on page 38 of the issue of July 3, 1920. Their size may be judged from the fact that their gross earnings in the last fiscal year exceeded $300,000,000 and that they operated one-seventh of the track mileage of the United States. Six of the companies under consideration operate urban surface lines, and the others are rapid transit lines in whole or in part.

The smallest of these properties did an annual business exceeding $8,000,000 and the average receipts of the twelve were more than $25,000,000. The prevailing rates of fare varied, three charging 5 cents; two, 5 cents with a 2 cent transfer charge; one, 6 cents with a 1 cent transfer charge; three, 7 cents; one, 8 cents and two, 10 cents.

Gross earnings of the six large surface companies showed an increase of 17.4 per cent over the previous year, while there was a gain of 21.8 per cent in operating expenses including taxes. For the six rapid transit companies these increases were 17.2 and 22.3 per cent, respectively. The operating ratio for the surface group averaged 87.45 per cent and ranged from 78.26 to 103.38 per cent, whereas the average in the preceding year was 83.06. For the rapid transit group the average was 77.26 against 74 per cent in the previous twelve months, the percentages for the past year ranging from 57.83 to 89.02. The six companies in the latter group would have made a better showing except for the fact that half of them include a large percentage of surface mileage. Taking those which operate subways or elevated lines only, the operating ratio averaged 73.8. In 1918 their combined ratio was 60.74.

More service was rendered by each car in the past year on surface lines, the annual miles operated per car averaging 36,565 as against 35,703. The contrary was the case for the rapid transit lines, these figures being 38,440 and 39,200, respectively. The showing as to revenue pasengers hauled and revenue car miles operated is not given on a fair basis for the past twelve months because one of the larger properties was split up into several parts which decreased the total for the group of surface lines. As a result the totals for both these items was practically the same as in the preceding year. On the rapid transit lines, however, there was a gain of 11 per cent in number of revenue passengers, while the total of car miles was practically at a standstill. The number of car miles per car hour showed a decrease, evidently due to the fact that the car hours were augmented by contract requirements calling for payment of many "bonus" hours. This item, therefore, is not a true indication of speed performance.

It is impossible to secure a true statements of the total passengers per mile of single track operated because some of the companies, particularly in the rapid transit group, keep no account of transfer or free passengers. However, using the figures as they are presented, there was an increase of 9.4 per cent for surface companies and 4 per cent for rapid transit lines. The number in the former group ranged from 869,223 to 2,381,909, and in the latter from 1,198,190 to 1,603,281, showing plainly the absence of transfer and free passengers from the total.

In these figures, as in the ones given below, the comparison is not entirely fair because five of the companies have a fiscal year ending on June 30, while the others more nearly correspond to the calendar year. The latter class have the advantage of larger earnings from recent increases in rate of fare but on the other hand they were burdened with higher costs due to higher wages starting about the middle of the year.

STATISTICS PER CAR-MILE AND PER CAR-HOUR ON TWELVE LARGE ROADS

	Six Surface Lines	Six Rapid Transit
Transportation revenue per car-mile (average)	44.7c.	38.0c.
Expenses and taxes per car-mile (average)	37.6c.	30.6c.
Transportation revenue per car-hour (average)	$4.00	$4.63
Expenses and taxes per car-hour (average)	$3.37	3.70

Puget Sound International Railway & Power Company, Everett Wash.—The Puget Sound International Railway & Power Company will shortly put in operation its Marthas Lake substation.

Baltimore Triples Net

No Dividends Paid on Common Stock —Surplus Being Put Into the Property

The report of the United Railways & Electric Company, Baltimore, for the year ended Dec. 31, 1920, showed net earnings for the year amounting to $2.55 per share as compared with 60 cents the previous year. The par value of the stock is $50. The surplus at the end of the year after making reserve for injuries and damages as well as provision for Federal taxes for the year 1920 amounted to $1,165,027, or 238 per cent more than the previous year. The accompanying tables give in detail the income and expenses as well as miscellaneous statistical information concerning the year's operation in comparison with the previous year.

SURPLUS GOING INTO PROPERTY

The report calls attention to certain matters as the result of the year's operation.

(1) The company had net earnings during the year of $1,043,599 after the payment of all operating expenses, taxes, fixed charges and interest including interest on income bonds. The Public Service Commission of Maryland has ruled that it is to the best interest of the public, under existing conditions, that the company should earn a surplus of not less than $1,000,000 nor more than $1,500,000 for a year.

(2) The company paid no dividends on its common stock, but put the entire surplus, and in fact the entire amount of the year's depreciation reserve, back into the property. These sums, together with the ordinary maintenance account, aggregated a total sum of approximately $4,000,000. These expenditures, together with the acquisition of new cars, have created a marked improvement in the physical condition of the property. During the year a new contract was made with the Pennsylvania Water & Power Company for a full supply of power at a cost less than the company could produce power for itself. This enabled the Pratt Street power station to be sold for $4,000,000, which sum can be used for other capital purposes.

Another interesting item is that the ratio of fixed charges to gross receipts is now 18 per cent as compared with 46 per cent in 1900, which showed that owing to increased receipts the interest charges in 1920 were approximately 18 per cent of gross revenue, as compared with 34 per cent in 1911, and 46 per cent in 1900. During the past two years 41 miles of track have been reconstructed, which is nearly one-sixth of the total amount of trackage within the old city limits. During 1920 there were either built or rebuilt 19 miles of track, of which more than 3 miles represented extensions. During the year the company also abandoned 8.6 miles of old track, which it inherited from the days of duplicated street car service.

There have been added during the year thirty-three one-man front-entrance cars, which have been assigned to the Fremont Avenue line. One hundred double-truck center-entrance trailer cars were also purchased. Car trust certificates as of July 1, 1920 on an 8 per cent basis have been issued for payment of these cars.

All of the one-man front-entrance cars have been in service since July 1 and have demonstrated satisfactory and economical operation, as

INCOME STATEMENT—UNITED RAILWAYS & ELECTRIC COMPANY OF BALTIMORE

Year Ended Dec. 31:	1920	1919	Per Cent Change
Revenue from transportation	$17,196,471	$14,711,455	16.89
Revenue from other railway operations	117,128	82,729	41.49
Total railway operating revenue	$17,313,599	$14,794,234	17.03
Railway operating expenses:			
Way and structures	$1,004,747	$915,289	9.77
Equipment	1,087,002	919,863	18.17
Power	75,738	64,080	18.19
Total maintenance	$2,167,487	$1,899,232	14.12
Depreciation	865,680	739,712	17.03
Power service	1,170,404	1,027,846	13.87
Conducting transportation	5,465,492	4,898,515	11.57
Traffic	12,066	5,262	129.32
General and miscellaneous	1,649,712	1,361,383	21.18
Total operating expenses	$11,330,841	$9,931,950	14.08
Net operating revenue	5,982,758	4,862,284	23.20
Taxes, licenses, etc., assignable to railway operation	1,839,421	1,409,262	30.52
Operating income	$4,143,337	$3,453,022	19.99
Non-operating income	120,740	40,017	200.97
Gross income	$4,264,077	$3,493,139	22.07
Deductions:			
Interest on funded debt	$2,030,264	$1,998,600	1.58
Rents	421,384	477,793	*11.81*
Interest on unfunded debt	117,490	93,200	26.06
Interest on income bonds (4%)	559,157	559,080	0.01
Amortization of discount on funded debt	53,068	48,785	8.78
Other amortization items	....	30,000	.....
Miscellaneous	39,115	39,257	*0.36*
Total deductions from gross income	$3,220,479	$3,246,715	*4.64*
Net income transferred to profit and loss	1,043,599	246,424	324.00
Profit and loss surplus at beginning of year	345,057	362,370	*4.67*
Profit and loss credits	462,962	342,527	35.20
Gross profit and loss surplus	1,851,619	951,322	94.90
Dividends and common stock	....	204,612	.....
Dividends on preferred stock	383	920	58.40
Contributions incident to the war	....	23,176	.....
Adjustment of reserve for injuries and damages	170,888	225,000	*24.00*
Provision for uncollectable accounts receivable	....	30,586	.....
Income and excess profits taxes	48,008	86,221	*43.40*
Welfare department deficits	....	31,004	.....
Adjustment items in cancellation of preferred stock	6,870	....	.....
Loss on abandoned equipment of leased road	158,327	....	.....
Engineering and other deferred expenses	183,230	....	.....
Metal tickets and fare boxes	45,959	....	.....
Adjustment account of power contract	56,573	....	.....
Miscellaneous	16,354	4,746	244.50
Total profit and loss debits	$686,592	$606,265	13.25
Profit and loss surplus at end of year	$1,165,027	$345,057	238 00

Figures in italics show decrease.

well as ability to furnish a much more frequent headway. The results show a net saving through increased receipts due to increased mileage and decreased cost of approximately 30 per cent per year on the investment. The trailer cars are gradually being introduced and are producing economies both in platform labor and power consumption, at the same time reducing the congestion in the business section of the city, as it is obvious that two cars, operated as a unit, are able to pass through the traffic with greater expedition than two cars operated singly. For the purpose of hauling the trailer cars, alterations are being made to 150 double truck-motor cars. These alterations consist of adding vestibules, folding doors and steps, changing platform control, installing door contacts, lights and signals, as well as a new type of coupling device. The work of vestibuling the double-truck semi-convertible cars is proceeding in accordance with the orders of the Public Service Commission at the rate of six cars per month.

Systematic efforts to reduce accidents showed that notwithstanding the increased car mileage there were 12 per cent fewer accidents than in 1919.

The company has made quite a number of experiments in re-routing of cars and with a service of limiting stops. These experiments have been tried only after an exhaustive study of the situation, which indicated possible favorable results. The public has been most patient with these experiments and should greatly benefit by increased carrying facilities and shortening of time spent upon the cars. This, with the co-operation of the Police Department of the City of Baltimore in helping the traffic conditions, has enabled the company to show approximately 11 per cent improvement in the speed of cars.

Appended to the report are graphic charts showing in detail the various operating costs, the receipts and expenditures per car mile and the distribution of gross revenue in fixed charges and various operating expenses on a percentage basis. An organization chart of the various departments is also attached.

STATISTICAL INFORMATION—UNITED RAILWAYS & ELECTRIC COMPANY OF BALTIMORE

	1920	1919	Per Cent Change
Car-miles operated	37,162,202	35,522,354	4.62
Revenue passengers	253,934,179	243,890,966	4.12
Transfer passengers	93,883,660	86,756,575	8.22
Total	347,817,839	$330,647,541	5.20
Operating ratio	65.44	67.20	(a) *1.76*
Car-mile statistics:			
Operating revenue (cents)	46.70	41.70	12.00
Operating expenses (cents)	30.55	28.00	9.10
Net income (cents)	2.81	0.69	3.07
Total revenue and transfer passengers	9.37	9.32	0.54
Car-miles per revenue passenger	0.1069	0.1458	(a) *0.0389*
Taxes—Per cent of gross revenue	10.55	9.50	(a) 1.05
Per cent of net operating revenue	30.75	29.00	(a) 1.75
Return earned and common stock ($50 par)	$2.55	$0.60	324.00
Depreciation reserve:			
Per cent of road and equipment value	1.055	0.972	(a) 0.083
Per cent of operating revenue	5.00	5.00	....

(a) Difference.

Earnings of Ohio Electric Railway Improve

The report of B. H. Jones, receiver for the Ohio Electric Railway system, made to the federal court at Toledo, Ohio, during the week ended April 30, for operations from Jan. 26 to Feb. 28, indicates that under the receivership the group of properties in the system made a substantial gain in earnings over the same period a year ago. The receipts from all sources totalled $1,130,351. After disbursements a cash balance of $102,015 was left.

The Indiana, Columbus & Eastern Traction Company, a subsidiary, had a surplus from operations of $1,346 for the month, compared with a deficit of $11,344 for the same period in 1920.

The Columbus, Newark & Zanesville Electric Railway had a surplus from operations of $9,697 for the month compared with a deficit of $6,895 for the same month a year ago.

The Fort Wayne, Van Wert & Lima Traction Company had an operating surplus of $588.

The Ohio Electric Railroad, which owns and operates the lines from Toledo to Lima, had an operating deficit for the month amounting to $9,496 as compared with a deficit of $18,258 for the same period in 1920.

Refinancing Plans Approved

Stockholders of the Northern Ohio Traction & Light Company, Akron, Ohio, have approved the refinancing plans involving the sale of $4,548,000 of preferred stock, bringing the capitalization to $20,000,000 of equal portions common and preferred.

The new stock will be offered to stockholders on either of the following plans: An exchange of two shares of the old 6 per cent preferred for two of the new 7 per cent by buying one share of the new at $95 and accrued interest, or an exchange of the old for the new by payment of $10 for each share so exchanged. In either case stockholders must agree not to sell their stock for less than $95 prior to Jan. 1, 1923. Stock not taken by stockholders will be offered to customers.

The plan for this rearrangement of the capitalization of the company was reviewed at length in the ELECTRIC RAILWAY JOURNAL for April 30, page 829.

Answers to Accounting Questions

Another Series of Questions and Tentative Answers Under the Uniform System of Accounts for Electric Railways

Another series of tentative answers to questions raised in connection with the uniform system of accounts, prescribed by the Interstate Commerce Commission, has just been issued. As these answers have not received the formal approval of the commission, however, it should be understood that the decisions do not represent its final conclusions and that they are subject to such revision as may be thought proper before final promulgation in the accounting bulletins of the commission.

THE case numbers covered below are from A-548 to A-563, with certain omissions. Other installments will follow. The omitted numbers represent cases which either are not of sufficient importance to justify publication or involve questions upon which a definite conclusion has not been reached.

Q. (*A*-548). In track renewal work where the old rail is replaced with heavier rail and untreated ties are replaced with creosoted ties, what accounting should be followed?

A. The excess cost of the improved rails, rail fastenings and ties over the original cost (estimated if not known) of the rails, rail fastenings and ties removed shall be charged to the appropriate road and equipment accounts. The remainder of the expenditures less the value of salvage recovered shall be charged to the appropriate accounts in operating expenses.

Q. (*A*-550). To what account should be charged the cost of labor cutting grass and weeds on the right-of-way and about trestles and bridges for protection against fire?

A. To account 8, "Track and roadway labor." (See Cases 61 and 319, Accounting Bulletin 14.)

Q. (*A*-551). To what account should be charged the cost of X-ray apparatus and the expenses of a representative sent to inspect the same before purchase?

A. The cost of the X-ray apparatus, including the cost of inspection, is chargeable to account 538, "Miscellaneous equipment."

Q. (*A*-552). To what account should be charged rent paid for foreign equipment used for maintenance of way and structures?

A. To account 98, "Rent of equipment." (See Case 274, Accounting Bulletin 14.)

Q (*A*-554). To what account should be charged the cost of a waste paper baling machine?

A. To account 538, "Miscellaneous equipment."

Q (*A*-555). A carrier issues one-year notes to refund an issue of two-year notes carried in the funded debt account. Should the refunding issue be accounted for as funded debt and the discount treated correspondingly?

A. The face value of the one-year notes shall be credited to account 430, "Loans and notes payable." The discount shall be included in account 420, "Other unadjusted debits," and amortized by monthly charges to account 221, "Interest on unfunded debt."

Q. (*A*-556). A carrier constructs a track to an industry under agreement that the industry shall advance part of the construction cost and be reimbursed therefor on the basis of cars switched for the industry. What is the correct accounting?

A. The entire construction cost shall be charged to the investment accounts. The amount advanced by the industry shall be credited to account 438, "Other deferred liabilities," and refunds shall be debited thereto as made.

Q. (*A*-557). When a lessee carrier bears the sinking fund charges of a lessor carrier and meets these charges from proceeds of a bond issue, in whose books should the sinking fund accounts be set up and what accounting should be observed with respect to: (a) Payments as made? (b) Accretions to the fund for interest thereon, etc.? (c) The acquirement of bonds for cancellation and retirement? (d) Discount or premium at which the bonds are purchased? (e) Expenses of the trustee incident to the reacquirement of the bonds? (f) Amounts paid for interest, accrued prior to date of purchase?

A. The lessee shall treat the payments as advances or rent according to the terms of the lease, sinking fund accounts being set up in the books of the lessor with accounting as follows:

(a) As payments are made by the lessee to the sinking fund trustee, the lessor shall debit account 402, "Sinking funds," and credit the lessee or the rent account, as appropriate. If treated as rent, a concurrent entry shall be made debiting account 309, "Appropriations of surplus to sinking fund and other reserves," and crediting account 449, "Sinking fund reserves."

(b) Accretions to the fund for interest, etc., shall be debited to account 402 and credited to account 209, "Income from sinking fund and other reserves," and concurrently account 309 shall be debited, and account 449 credited if the amount thereof is to be held as a part of the reserve. If this, or any other item previously appropriated from surplus, is later used in the reacquirement of the carrier's own bonds for cancellation, account 449 shall be debited and account 448, "Funded debt retired through surplus," shall be credited with the amount expended in the discharge of the principal (less the discount, if any, suffered at time of sale).

(c) When bonds are reacquired for cancellation and retirement account 427, "Funded debt unmatured," shall be debited and account 402 credited with the par value of the bonds.

(d) Concurrent with the entry provided in paragraph (c), account 402 shall be debited and account 306, "Miscellaneous credits," credited with the amount of the discount at which the bonds were purchased, or if acquired at a premium, account 402 shall be credited and account 317, "Miscellaneous debits," debited with the amount of the premium paid.

(e) Expenses of the trustee incident to the reacquirement of bonds such as those for advertising, notary's fees, etc., shall be debited to account 317, "Miscellaneous debits," and credited to account 402.

(f) Amounts paid for interest which accrued prior to the date of purchase by the trustee shall be debited to the account originally credited and credited to account 402; and if accrued interest has been set up in the accounts for the period subsequent to the date of reacquirement an adjusting entry shall be made canceling the same. (See Case 312, Accounting Bulletin 14.)

Q. (*A*-560). A carrier wrote off to profit and loss in former years the cost of an investigation concerning the advisability of constructing an extension, the project having been abandoned before construction was begun. The same project is now revived and upon basis of the former investigation the extension is made. Is it permissible to restore the former preliminary costs and include them in the cost of the present work?

A. Expenditures for the preliminary investigation shall be included in the cost of the extension and profit and loss credited with the amount previously charged thereto.

Q. (*A*-561). To what accounts should be charged the cost of hand trucks, miscellaneous hand tools and warehouse scales purchased when an electric carrier begins the handling of freight traffic?

A. The cost of such property is chargeable to account 538, "Miscellaneous equipment," except built-in scales, the cost of which is chargeable to account 524, "Stations, miscellaneous buildings and structures."

Q. (*A*-562). A carrier sells power to an industry at cost, plus a fixed percentage for fixed charges and return on investment and desires to exclude from its power accounts the cost of the power thus sold. Is it permissible to credit the several power production accounts with the cost of production and revenue account 118, "Power," with the balance?

A. The power furnished the industry shall be accounted for as a sale and the entire proceeds therefrom credited to revenue account 118, "Power," unless the power business is accounted for as an auxiliary operation, in which case account 202, "Auxiliary operations—Revenues," shall be credited.

Q. (*A*-563). To what account should be charged the cost of dredging to restore depth of water at a dock used for ferry service incident to railway operations?

A. To account 24, "Buildings, fixtures and grounds."

Boston Deficit Being Reduced Gradually

Revenue from direct operation of the Boston (Mass.) Elevated Railway was $23,003 less during the month of April this year than last, but notwithstanding this handicap the company succeeded in offsetting this loss of revenue and secured a net gain for the month of $222,134. It is anticipated by the management that if the co-operative efforts are continued the deficit which was so formidable last Fall will soon be only a memory. The outstanding deficit is as follows:

	Deficit	Surplus
Year ended June 30, 1920		$17,079
Back pay	$435,348	
Six months ended Dec. 31, 1920	387,691	
Jan. 1 to May 1, 1921		536,773
Squantum service and other adjustments		34,287
Total	$823,039	$588,139
Net deficit, May 1, 1921	$234,899	

In making this statement of earnings public the following principles, enumerated by the board of trustees in connection with the readjustment of wages, were reiterated:

1. The fact that although a substantial decrease has already taken place in many items affecting the cost of living, that cost is not yet upon any settled basis so that it is peculiarly a fitting time to put in practice the belief of the trustees that to be consistent they should be as deliberate and conservative in following the cost of living when it is upon a downward trend as in following it when it is an upward movement.

2. The fact that they thoroughly appreciate the co-operation that the men have given to the management during the past year which has made possible what would otherwise be impossible in the saving of expenditures amounting to large economies; in other words, the existence of the spirit which has financial as well as other value in the conduct of this service.

3. The fact that as public officials they are in charge of a public business entirely disconnected from any private or competitive industries and that in this attitude they should be careful not to adopt as a standard for the payment of compensation any other rule than that of a full fair wage for work that is earnestly performed.

Further comment by the company follows:

> Such consideration carries with it responsibilities. We all have reason to be proud of our work during the past year, but the next twelve months should still further advance our record of efficiency and economy in the interest of the car rider. There must be no idle hours; there must be no waste of material; every move should count.
>
> Co-operation means securing all the revenue, avoiding accidents, being considerate of car riders, helping one another, conserving supplies and materials and not wasting time.

Seattle Far from Being Out of the Woods

According to the monthly report of the Seattle Municipal Railway, $37,338, or about half the amount needed each month for bond redemption, was set aside in April. Revenues were $529,109, against $362,738 expenses, leaving a balance of $116,371. The balance of $37,338 is obtained after deducting interest and depreciation. The balance in March was $32,069. The report said in part:

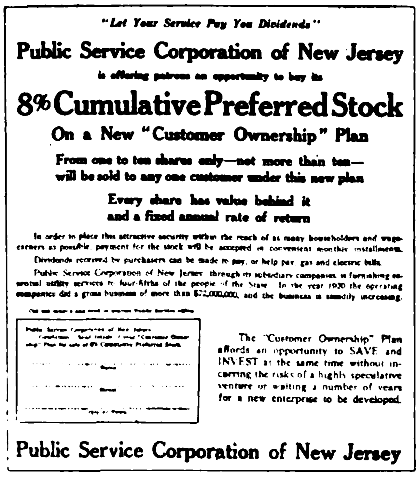
> The report is encouraging, but we are far om being out of the woods. We have not aside the money for bond redemption. he interest money has been used to outstanding warrant, so that while a cash balance of $98,014 at the month there should be considerably more to meet interest and redemption charges.
>
> The depreciation charge has been made only on the books, the money being used to retire warrants. The light department's annual report, just at hand, shows large expenditures on replacements, financed out of the depreciation fund. The depreciation fund in that department is actual not theoretical.

Customers Offered Stock

$2,000,000 of Eight per Cent Preferred Issue Placed on Sale in New Jersey

The Public Service Corporation of New Jersey started a campaign on May 23 to sell $2,000,000 of its 8 per cent cumulative preferred stock to the customers of its three subsidiary companies, Public Service Gas, Public Service Railway, and Public Service Electric Company.

The campaign is under the general direction of R. R. Young, the new business agent. The sales will be made through the employees of the company or directly through the business offices. A partial payment plan will be used, a cash payment of 10 per cent at the time of purchase, and 10 per cent monthly thereafter until the entire purchase price is paid, being the method of sale. The subscription price is par and accrued dividends. Interest at 6 per cent will be allowed upon money paid in until the entire price has been paid.



"Let Your Service Pay You Dividends"

Public Service Corporation of New Jersey

is offering patrons an opportunity to buy its

8% Cumulative Preferred Stock

On a New "Customer Ownership" Plan

From one to ten shares only—not more than ten—
will be sold to any one customer under this new plan

Every share has value behind it
and a fixed annual rate of return

In order to place this attractive security within the reach of as many householders and wage-earners as possible, payment for the stock will be accepted in convenient monthly installments.

Dividends received by purchasers can be made to pay, or help pay, gas and electric bills.

Public Service Corporation of New Jersey, through its subsidiary companies, is furnishing essential utility services to four-fifths of the people of the State. In the year 1920 the operating companies did a gross business of more than $72,000,000, and the business is steadily increasing.

The "Customer Ownership" Plan affords an opportunity to SAVE and INVEST at the same time without incurring the risks of a highly speculative venture or waiting a number of years for a new enterprise to be developed.

Public Service Corporation of New Jersey

ADVERTISEMENT OFFERING PUBLIC SERVICE STOCK

The plan marks the start of an entirely new policy on the part of the Corporation. Never before in its history have Public Service securities been offered direct to the public, the method employed heretofore being to sell securities in large lots to investment bankers, who retailed them to the public.

Under the new system of direct sales and partial payment the corporation expects greatly to increase the number of its stockholders among the people who receive its service and thus arouse the interest of its patrons in the company's affairs. Purchasers will become partners in the enterprise with all the rights and privileges, including voting power, that go with the ownership of preferred stock.

The issue has behind it the credit of Public Service Corporation, the subsidiary companies of which in 1920 did a combined gross business of $72,318,087, nearly $35,000,000 more than was done in 1915, and nearly $45,000,000 more than was done in 1910.

Statistics taken from the last annual report of the corporation give some idea of the magnitude of its transactions. The electric company in its eighteen generating stations produced more than 892,000,000 kw.-hr. in 1920, distributed it over 20,000 miles of wire carried on 176,000 poles or lead through 158 miles of conduit to 234,496 meters. In the same year the gas company produced 16,500,000,000 cu.ft. of gas and distributed it through 3,170 miles of main to 553,343 meters, while the railway carried 453,000,000 passengers and operated its cars a total of 60,798,000 miles.

Financial News Notes

No Provision for Interest on Notes.—No arrangements were made for the payment, exchange or extension of the $7,750,000 of 7 per cent notes of the Kansas City (Mo.) Railways due on May 15. No interest accruing on them since that due on May 15, 1919, has been paid, and no interest on any of the company's securities has been paid since July 1, 1919. The company has been in receivership since Sept. 9, 1920.

Railway Appoints Purchase Arbitrator. — Formal notice has been received by the city from the Toronto (Ont.) Railway of the appointment of Sir Thomas White as arbitrator for the company on the board to determine the value of the assets to be acquired by the city when the railway is taken over on Sept. 1 next. Sir Thomas stated that he had not met Sir Adam Beck to discuss the name of the third member of the board, who will be chairman. If the two are unable to agree on one person, an application will be made to the courts to designate a chairman of the board.

New Operating Contract Under Negotion.—Negotiations are under way between the Dallas (Tex.) Railway Company and the Standard Traction Company by which the cars of the Standard Traction Company would be permitted to use the tracks of the Dallas Railway into the business section of the city. The Dallas Railway on May 1 ceased operation of cars on the tracks of the Standard Traction Company, the contract entered into between these two companies having expired. The Dallas Railway at that time said that operation of cars on the tracks of the Standard Traction Company had been continued at a loss and that service could no longer be continued.

Traffic and Transportation

Cincinnati Still Battling

Reduction in Fares May Be Secured by Deferring Collection of Franchise Tax

Following a series of conferences extending over a period of three weeks, participated in by committees representing the city administration, the Cincinnati (Ohio) Street Railway, stockholders, the directors of the company and the Cincinnati (Ohio) Traction Company, assurance has been given that a reduction in fares may be expected Aug. 1, and a still further reduction approximately by Nov. 1. Definite announcement as to this, however, cannot be made until the city indicates its consent to a modification of the franchise ordinance under which the traction company now operates.

The demands of the city are as follows:

1. That improvements of the railway as demanded by the city be made at once.
2. That steps be taken to reduce the prevailing rate of fare as early as possible.
3. That the program concerning the repairing of tracks and streets for 1921 as agreed upon be strictly carried out.
4. That needed repairs on tracks on streets not included in the regular 1921 program be made.
5. That a reduced rate of fare be provided for children of the public and parochial schools.

The Cincinnati Traction Company seems to be in accord with the demands by the committee and a letter was received by members of the committee representing the city administration, signed by W. Kesley Schoepf, president of the Cincinnati Traction Company, in which he said that if financial arrangement could be made he saw no reason why the program could not be carried out.

Mr. Schoepf seeks a postponing or deferring of the collection of the city franchise tax for years 1920 and 1921, saying that the city may reserve the right to make demand for the restoration of all or any portion thereof, as a charge against the company's gross receipts after Jan. 1, 1922. By postponing the payment of this tax, it is believed that it will be legally permissible under the obligations of the service-at-cost franchise to proceed with the reduction of the fare.

The Cincinnati Street Railway has already shown its willingness to assist the Cincinnati Traction Company in getting new capital to make improvements demanded by the city by approving the plan to lend its credit to the extent of $650,000.

Mr. Schoepf's letter follows in part:

I am prepared to say that this company can meet the views of the city administration in these particulars conditioned upon the following:

1. That the Cincinnati Street Railway will assist the Cincinnati Traction in procuring new capital with which to make the desired and needful improvements. This new capital should not only be sufficient to meet immediate requirements but provide for the future and if possible enable the Cincinnati Traction Company to refund outstanding high rate securities at a lower rate, effecting a reduction in fixed charges on the car rider.

2. That the city of Cincinnati will agree to certain amendments to Ordinance No 253, 1918, to provide:

(A) For deferring or postponing collection of the city franchise tax for 1920 and 1921, the city reserving the right to make demand for restoration of all or any portion thereof, as a charge against the company's gross receipts after January 1, 1921.

(B) For removing the requirements of payments into the reserve fund as provided in Subdivision H. of Paragraph 22 or Ordinance No. 253, 1918, as long as fares are higher than seven and one half cents.

(C) That the city will promptly cooperate with the company in developing a plan for rerouting certain lines, thus relieving congestion and saving unnecessary service and thereby reducing costs of operation at the same time as improving the service rendered.

If these conditions can be met—and I can see no obstacle to their being met—I can reasonably assure you that the desired results can be brought about.

INTERCORPORATE SUIT NOT AFFECTING

Mr. Hornberger, chairman of the city committee, stated he realized the force of the argument as to the deferment of the franchise tax, since the traction company is in no financial position to pay it, but that he was prepared to say that the city would consent to the proposal. The same, he said, was true with reference to the reserve fund.

As to that portion of Mr. Schoepf's letter in which co-operation of the city is sought in developing a plan for rerouting it may be said that the city at all times has been willing to cooperate with the officials of the traction company.

Mr. Schoepf announced that whatever results would be achieved as a result of conferences alluded to, the suit for an accounting now pending against the Cincinnati Traction Company is not involved. There can be no compromise of the questions involved in that suit, Mr. Schoepf said. We will insist that the case be tried in open court and that the company be given an opportunity to prove that the charges and claims made against it in the suit are not true.

Six Cents Not Enough.—A 7-cent fare has been asked by the Little Rock Railway & Electric Company, Little Rock, Ark., in a petition filed with the city clerk to be presented to the Council shortly. The company says a raise from the present 6-cent fare is necessary since the income is just sufficient to meet operating costs. This fare was granted one year ago. The petitioners allege that the company has not paid a dividend since 1918.

More Fares Cut

Advantage of Wage Reduction Passed on to Car Rider by Eastern Massachusetts Company

In accordance with promises made to the public prior to the wage reductions just established, the trustees of the Eastern Massachusetts Street Railway announced reductions in fares on all lines, effective on May 23. In general, these changes in fares took the form of increases in the number of rides sold for one dollar the basic single cash fare of 10 cents still remaining the established unit.

The new rates of fare have been computed as nearly as possible, on the basis of giving the car-riders the entire benefit of the reduced operating expenses which will result from the 12½ per cent cut in pay for trainmen and departmental employees. The decision of the Massachusetts Board of Conciliation and Arbitration, handed down on May 14, made this cut effective retroactively to May 2. When the trustees first proposed to reduce the wage scale they made public announcement of their intention to devote the expected savings to immediate reductions in carfares.

No official statement of the probable total reductions in payroll as compared with last year has been made, but it is variously estimated at from $500,000 to $750,000. During the past year a great many one-man cars have been put into service, and it is proposed to continue increasing this type of service until practically the entire system is operating on a one-man car basis.

The principal changes in fares are shown in the accompanying statement. In a number of cases where several rides are sold for a dollar a rebate of several cents is made in order to induce the passenger to turn in the ticket when it is used up. This is for auditing purposes, as the tickets take the form of a card, on which the conductor punches out one number for each ride.

In the following tabulation the average cost per ride allowing for rebate is shown in parentheses after each ticket group:

LINES NORTH OF BOSTON

Lowell-Lawrence district:
  Formerly 13 for $1, with 8c. rebate (7.08c.)
  Now 15 for $1, with 5c. rebate (6.33c.)
Haverhill district:
  Formerly no tickets (10c. cash only)
  Now 13 tickets for $1, no rebate (7.69c.)
Lynn:
  Formerly 15 for $1, no rebate (6.67c.)
  Now 17 for $1, no rebate (5.88c.)
Salem:
  Formerly 14 for $1, no rebate (7.14c.)
  Now 15 for $1, no rebate (6.67c.)
Melrose-Woburn district:
  Formerly 13 for $1, with 8c. rebate (7.08c.)
  Now 14 for $1, with 7c. rebate (6.64c.)
Boston to Revere, ticket rate unchanged:
  Formerly 15c. cash fare
  Now 10c. cash fare
Boston to Lynn, ticket rate unchanged:
  Formerly 30c. cash fare
  Now 20c. cash fare

LINES SOUTH OF BOSTON

Quincy:
  Formerly 13 for $1, no rebate, (7.69c.)
  Now 15 for $1, no rebate, (6.67c.)
Brockton:
  Formerly $13 for $1, with 8c. rebate (7.08c.)
  Now 14 for $1, with 5c. rebate (6.79c.)

Six Cents Cash in Los Angeles

Continuation of the 5-cent fare by the purchase of ten tokens for 50 cents and the establishment of a 6-cent cash fare for individual rides mark the decision rendered by the California Railroad Commission on June 1 in the case of the Los Angeles Railway. The railway applied for an increase in fare last August and a hearing was conducted in October.

Various improvements in service are ordered by the decision. They include the purchase of 132 additional cars to cost $1,400,000, the construction of additional carhouses, shops and substations and the making of track improvements, according to press reports.

A copy of the decision had not been received by the Los Angeles Railway up to the time the telegram containing this information had been filed for transmission to the ELECTRIC RAILWAY JOURNAL and an official statement was withheld by the management.

The commission estimates that two-thirds of the riders will use tokens and with the other third paying 6 cents and the natural growth in traffic, the company should receive under this arrangement a gross annual revenue of approximately $10,120,000.

The commission stated in its opinion that the zone system would be impracticable for Los Angeles except as a last resort.

Petition to Prevent Railway Engaging in Bus Business

A fight has been started before the California State Railroad Commission to prevent the Pacific Electric Railway, Los Angeles, Cal., from entering into the automobile stage business in competition with motor passenger cars that use the highways. The Motor Transit Company, which controls and operates a large number of auto stage lines in and out of Los Angeles to surrounding towns served by the electric interurban lines of the Pacific Electric, is the principal opponent in the fight, contending that a motor bus service recently established by the Pacific Electric Railway between San Bernardino and points in the San Bernardino mountains is an illegal enterprise, and has asked the State Railroad Commission to eliminate the electric line as a competitor. According to the Motor Transit Company's petition it also operates a transportation system in the territory covered by the Pacific Electric in the district referred to.

It is stated that the proceedings instituted by the Transit Company are regarded as a test case. The decision of the State Railroad Commission, it is generally agreed, will establish the status of railroads employing motor lines to compete with those already existing.

The establishment of auto stage lines by the Pacific Electric is said to be in line with a policy announced several months ago by the officials of that company, who stated the corporation would be compelled to enter the automobile transportation business if further inroads into the company's receipts were to be prevented.

Ten-Cent Fare Suburban Lines Last Hope

At the resumption of the hearing on April 26 before the Board of Public Utility Commissioners of New Jersey on the application of the New Jersey & Pennsylvania Traction Corporation, operating between Trenton and Princeton, for an increase in fare from 7 cents to 10 cents in each of four zones between Trenton and Princeton, John J. Treacy, chairman of the commission, remarked that the concern was "harping" upon the fact that a certain amount of money was put in the company and apparently for that reason an increase of fare was expected. In addressing Sidney L. Wright, president of the concern, Commissioner Treacy said:

"Of course you understand, Mr. Wright, that this board can't give you an increase in rates merely because the property owners have put a certain amount of money in the company."

Commissioner Treacy remarked that many other things besides a loss in money to stockholders would have to govern the granting of an increase in rates to a utility company. The commissioner pointed out that operating costs had to be taken into consideration together with wages, cost of power and anything that would tend to make operating costs higher.

Mr. Wright stated that an increase to 10 cents was all that could be expected by the railway, and failing to operate on the increase the company would have to pocket the loss. President Wright admitted to Henry Hartmann, attorney of Trenton, that the 10-cent fare was merely asked for because every other means had been exhausted in an effort to make the company a financial success. Mr. Wright characterized the 10-cent fare application as the concern's "last hope."

One-Man Cars Prohibited

At a recent election the voters of Sacramento decided in favor of an ordinance prohibiting the operation of one-man cars in that city. The Pacific Gas & Electric Company, San Francisco, controls and operates the city lines, but the operating company does not intend to remove the cars from its lines in Sacramento, as they are permitted under the terms of the ordinance to have two men in charge of a one-man car. Therefore, by putting conductors on the cars the company will be within the law. It is apparent that this ordinance was fostered by union forces. It is not stated whether the company will test the constitutionality of the newly passed law.

The New York Transit Commission of New York has made its first report to the Governor. No statement has been made about the contents of the report.

Reduced Fare to Solve Jitney Problem

The Indiana Public Service Commission will reduce the fare of the Indianapolis Street Railway to 5 cents and increase the transfer charge to 2 cents for a period of sixty days, according to a decision reached following a conference with members of the City Council. The Council will order the company to reroute cars in the downtown congested district in an effort to obtain faster schedules and improved service. These measures will be taken in an attempt to enable the company to compete successfully with jitney lines, and if a decrease in "jitney" traffic is not shown at the end of the sixty days, the Council will pass an ordinance regulating the operations of "jitney" lines.

These are the outstanding points of agreements reached at the joint conference which was held in the office of John W. McCardle, chairman of the Public Service Commission, attended by all members of the Council, all members of the commission and Samuel Ashby, city corporation counsel. It was arranged as a result of testimony given the commission by officers of the railway in their petition for relief from operations of jitneys. The order for 5-cent fare and 2-cent transfer charge will be made soon unless some unforeseen event arises to cause reconsideration, Mr. McCardle said.

This appears to be the best solution of the problem of "how to compete with the jitney." Since the inception of the 6-cent fare the jitneys have been doing an enormous business while the result of operation on the Indianapolis Street Railway from April 18 to May 17, 1921, shows a decrease of 851,109 revenue passengers.

Seven Cents in Norfolk

The City Council of Norfolk, Va., has passed an ordinance granting the Virginia Railway & Power Company a 7-cent fare with free transfers until Jan. 1, 1922, unless the granting of a new franchise automatically cancels the temporary rate sooner. The increase was based on a report by Charles E. Ashburner, city manager, who upheld the contention of the officials of the company that its operations are resulting in a net loss, which will force the company into the hands of a receiver unless relieved. The ordinance takes effect thirty days from the date of passage, but it will not be placed in operation until a similar increase on the county lines to be asked by the Virginia Corporation Commission becomes effective. An audit of the company's books, according to Mr. Ashburner, showed a net deficit of $218,229 for nine months, after deducting net earnings, the depreciation charges, interest on bonds, and payment on guaranteed stock. He estimated a 7-cent fare will increase revenue for nine months by $251,590, or about $33,000 more than the money needed to pay the interest charges.

Limited Interurban Bus Service

The Smith-Thompson Transportation Company, Everett, Wash., which when incorporated will be known as the "Interurban Motors Company," has placed orders for six White chassis, which have been delivered, and the bodies are now in course of construction. Four of the cars will be of the type used at present between Olympia and Tacoma, but two will be limited cars, having many new features.

Schedules have been completed which will yield a half hour service between Everett and Seattle, hourly service between Everett and Mt. Vernon by bus and two-hourly service between Everett and Bellingham. Under these conditions seven through connecting trips per day will be made between Bellingham and Seattle each way and the time will be four hours and four minutes. The fare will be nearly $1 cheaper than the steam road fare for a round trip.

The new service will link up the Northern and the Southern divisions of the Pacific Northwest Traction Company.

Commission Would Have Railway Operate Buses

President Emmons and General Manager Flowers of the United Railways & Electric Company, Baltimore, Md., conferred recently with members of the Public Service Commission on the bus situation. The commission is desirous of having the railway establish bus service in certain sections of the city which do not produce sufficient traffic to justify the laying of tracks for regular trolley service. It is also desired by the commission that the railways establish bus service on East Fayette Street in order that the number of "fly-by-night" machines on that street may be lessened and the traffic concentrated in a company of financial responsibility.

At the same time there was some discussion of taking the blue line buses off Charles Street, which is becoming greatly congested, and transferring them to St. Paul Street, at least as far as North Avenue. These buses are run by the United Railways.

The railway officials are said not to look with favor on the establishment of bus lines as a supplemental service, but President Emmons expressed a desire to go as far as the company's finances would permit in meeting the wishes of the commission. Nothing definite was determined upon at the conference, but Commissioner Whitman stated that he was at work on a plan for handling the bus situation, which will be shown to the railway's officials later.

The jitney business in Baltimore is practically confined to one small line operating cheap buses on East Fayette Street. It would appear to be the thought of the commission to determine whether there is an actual need for this line, and, if so, whether it would not be profitable to have it operated by the railway, which could be held to more responsible operation than the present private owners.

Transportation News Notes

Fares Remain Ten Cents.—The Mississippi Railroad Commission recently ruled that the Meridian Light & Railway, Meridian, Miss., must retain the 10-cent cash fare in that city. Children's tickets will be 5 cents. The company must issue tickets at the rate of six for 45 cents, each ticket good for one ride and one transfer. The commission's decision will abide for six months.

Council Approves Increase.—The City Council of Flint by a vote of eight to four recently approved a resolution authorizing an increase in fares on the Flint city lines of the Detroit United Railway from 5 to 6 cents. This action was taken on recommendation of a citizens' committee which had made a thorough investigation of the company's request for a higher fare. An examination by Prof. H. E. Riggs of the committee showed that the Flint city lines had been losing money for several years.

Suburban Fare Advanced. — The Dallas (Tex.) Railway has announced an 11-cent fare to Highland Park, which includes the line to Southern Methodist University. The company has been charging only 6 cents to Highland Park, which maintains corporate existence separate from the city of Dallas. A fare of 6 cents will be charged to the city limits of Highland Park, and an additional charge of 5 cents will be collected for those who ride beyond the boundary. It is likely that tickets will be sold to students at the university so that no hardship will be worked on them.

Seven-Cent Fare Sustained. — The Public Service Commission of Pennsylvania has upheld the 7-cent fare on the lines of the Shamokin-Mt. Carmel Transit Company. This finally puts an end to litigation that has extended over a period of four years. The case was started in June, 1917, with the borough of Ashland, the borough of Centralia and the mine locals of Centralia, Mt. Carmel, Kulpmont and Shamokin making the complaints. In its findings, the commission allowed a valuation of $1,300,000 on the property, and said that the profits of $56,848 for the year 1920, were not excessive, yielding only 4½ per cent. On June 4, 1917, the company abolished the custom of selling tickets, and substituted in place thereof, a 5-cent cash fare for each zone. On Jan. 15, 1918, the company made a further increase by substituting a 6-cent cash fare in each zone for the 5-cent cash fare. Subsequently the motormen and conductors struck for higher wages and the War Labor Board allowed the men a substantial increase. To meet this increase in wages, the company, raised the fare from 6 cents to 7 cents, which increase went into effect Sept. 26, 1919.

Official Freed of Charge.—New York City Comptroller Charles L. Craig was recently relieved by Judge Manton in the Circuit Court of a contempt charge found by Judge Mayer carrying a sixty-day jail punishment. The charge grew out of a communication between the defendant and Public Service Commissioner Nixon, in which Mr. Craig is said to have asserted that the federal justice prohibited an investigation by the city into the records of the Brooklyn Rapid Transit receiverships. In his findings Judge Manton says: "There is no divinity about the office or duties of a judge which makes him free from criticism. The statute requires a misbehavior which causes an obstruction of the administration of justice."

Company Voluntarily Reduces Fares.—W. J. Harvie, general manager of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., recently announced a fare reduction in Auburn to 7 cents. The company received permission from the Public Service Commission to sell fourteen tickets for $1 on the city lines and eleven lake tickets for the same amount. The straight fare in Auburn is 8 cents and 10 cents to Owasco Lake. In explaining the voluntary reduction Mr. Harvie said: "The public took the fare increases of the past two or three years in a big way. We have cut the cost of operation by the installation of one-man cars and it is no more than right that the people using the trolley share in this saving." The one-man car system in Auburn was put into effect on May 1. The company has reported that this method has been working out very satisfactorily.

Sustains Seven-Cent Fare.—The city of Fort Wayne, Ind., has lost its fight before the Public Service Commission against the Indiana Service Corporation for a reduction in fares, for the commission has announced the indefinite continuance of the 7-cent cash fare, with four tickets for 25 cents. The present rate of fare was established in the fall of 1920. The city sought a cash fare of 6 cents, or nine tickets for 50 cents. The commission in its order said that for the six months ended March 31 the railway made a return of 8 per cent on its investment, which was said to be $2,846,358. "This income shows that during the best six months of the year from the street railway standpoint, the months in which the maintenance work is normally the least and the number of revenue passengers the greatest, that the company earned no more than a reasonable return on its investment," the order said. The final conclusion of the commission is that "the petitioner will not earn in excess of a reasonable return under the fares now in effect."

Personal Mention

Mr. Kubu Returns to Cleveland Claims Department

Joseph S. Kubu, for nine years claim agent of the Utica Lines of the New York State Railways, has been appointed assistant superintendent of the accident department of the Cleveland (Ohio) Railway. In accepting the appointment Mr. Kubu returns to old friends and associates in a familiar field, as he had been successively investigator, adjuster and assistant claim agent of the Cleveland Railway before going to Utica in 1912. Mr. Kubu's long experience in claims work, his wide acquaintance with men in this department of public utility service, and an active participation in the work of the American Electric Railway Claims Association led to his election, in 1919, to the position of secretary, which he still holds.

His work with the New York State Railways had been of the highest order and has merited the attention of many traction companies from which he received offers. He had refused all inducements until his old employers made him the proposition of taking charge of their claim department. Mr. Kubu's home is in Cleveland.

Herbert E. Cady, Syracuse, succeeds Mr. Kubu at Utica. He has been assistant to Ansel D. Brown, claim agent for the New York State Railways at Syracuse, and is very popular among the railway officials of both cities.

Messrs. Carmichael and Bucher Promoted

D. C. Carmichael has been elected assistant secretary and E. R. Bucher has been elected assistant treasurer of the Southern Power Company, Charlotte, N. C. Mr. Carmichael and Mr. Bucher will share between them the duties formerly performed by E. C. Marshall, who was elected president of the Southern Public Utilities Company.

Also at the annual meeting of the Mill Power Supply Company Messrs. Carmichael and Bucher were elected secretary and treasurer respectively. W. G. Thomas, who had been manager of the company for the past four years, was made president and manager, succeeding N. A. Cocke as president.

Mr. Carmichael has been with the Southern Power Company for about ten years, serving a considerable part of that period as secretary to W. S. Lee. Mr. Bucher has been with the company since 1905, having been auditor for the company for a number of years past. Both are recognized by the company as young men of splendid qualifications.

The Mill Power Supply Company is the purchasing organization for the Southern Power Company, the Southern Public Utilities Company, the Piedmont & Northern Railway and other Duke interests in that section.

Steps Up to Managership

H. W. Witherspoon Promoted from Dispatcher to General Superintendent of Stark Electric Railroad

H. W. Witherspoon has been appointed general superintendent of the Stark Electric Railroad, with headquarters at Alliance, Ohio, to succeed M. L. Mowry, who recently resigned.

Mr. Witherspoon is a steam railroad man, having received his early railroad training as a telegraph operator, entering the service of the Pennsylvania Railroad on the Cleveland & Pittsburgh Division in 1901. He resigned two years later to enter the employ of the New York Central as an agent and telegraph operator, being promoted to the dispatcher's office late in the year of 1905. After holding the position of chief train dispatcher in 1917 he resigned a year later to become connected with the Stark Electric Railroad.

H. W. WITHERSPOON

While in the service of the New York Central Mr. Witherspoon had the honor of being the first train dispatcher to make use of the telephone in dispatching trains on a steam railroad. During his service with that road he contributed much toward the successful use of the telephone in railroad service.

Mr. Witherspoon will have entire charge of the operation of the Stark Electric Railroad Company's property. While his rise from the position of dispatcher to general superintendent is unusual it is certainly evidence of his ability and knowledge of the electric railway field.

The Stark Electric Railroad is an interurban which operates high-speed passenger and freight service, connecting Canton, Louisville, Alliance and several other Ohio towns. Besides operating a trackage of about thirty-six miles it owns and controls a pleasure park near Alliance.

Arthur W. Senter, superintendent of Division 4, Boston (Mass.) Elevated, left in April for Christiania, Norway, where he will investigate street railway conditions. From there he will proceed to Stockholm, Sweden, covering as many traction properties as possible, arriving home the early part of June.

Harrison Williams was elected chairman of the board of directors and chairman of the executive committee of the North American Company on May 20. As chairman of the board he is acting president. Mr. Williams became a director of the North American Company in June, 1920, when Clarence Dillon, George P. Miller, Edward N. Wells, and Frank L. Dame were also elected to the board of directors.

Walter A. Shaw, for more than seven years engineering member of the Public Utilities Commission of Illinois, has returned to practice as a consulting engineer, with offices in Chicago, Ill. He will give particular attention to public utility rate cases, reports for banks and investors, public utility and industrial management, operation and construction, and all branches of municipal engineering and construction work, including designing and supervision.

H. E. Blain. **C. B. E.**, assistant manager of the London Electric Railway and the Underground group of companies in London, who arrived this week in New York on the Olympic, will be joined by two other officers of his company shortly. These are C. S. Louch, controller and accountant, and J. L. B. Lindsay, assistant secretary to the treasurer. These gentlemen expected to sail from England on May 31 and will join Mr. Blain in New York for a trip of investigation of electric traction matters in this country.

C. H. Evenson and C. E. Jones have been appointed assistants to the general superintendent of transportation of the Chicago Surface Lines. Mr. Evenson is thirty-six years old. He has been connected with transportation companies in Chicago since 1908. For three years he was secretary to the president of the Calumet & South Chicago Railway, and for eight years he was secretary to the president of the Chicago City Railway and the Chicago Surface Lines. In February, 1920, he was transferred to the transportation department. Mr. Jones entered the service of the Chicago City Railway as a gripman in 1882. Three years later he was made a starter and in 1897 he was appointed supervisor. In 1906 he was made an assistant division superintendent and in 1912 was promoted to the position of division superintendent.

New Interests in Detroit United

Frank W. Brooks Has Resigned as President and Alex Dow of the Detroit Edison Has Been Elected a Director

Frank W. Brooks, president of the Detroit United Railway and its subsidiary properties, tendered his resignation as president and member of the board of directors at its meeting on May 25. Alex Dow, president and general manager of the Detroit Edison Company, has been elected to the board of directors. He will represent new Eastern financial interests which have entered the company. Malcolm McIntyre has resigned from the position of night superintendent to accept the appointment as general superintendent of the Mobile (Ala.)

Following the announcement of Mr. Brooks' resignation came the news that Malcolm McIntyre had severed his connection with the company to become general superintendent of the Mobile (Ala.) Railway.

Mr. McIntyre became identified with the Detroit United Railway as agent of the Rapid Railway at Algonac in 1903. Later he was appointed foreman at the Canfield carhouse, Mt. Clemens. He was subsequently transferred to Detroit, becoming foreman at the old Clark

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Electric Railway Cars Built in 1919 Number 2,352

Census Bureau's Preliminary Figures Show Decrease Over 1914—Also Fewer Steam Passenger Cars

A preliminary statement of the general results of the 1919 census of manufacturers with reference to the construction of steam and electric railroad cars has been issued by the Bureau of the Census, Department of Commerce. Returns were received in 1919 from 121 establishments which manufactured 162,511 steam and electric railroad cars, valued at $403,517,000, these figures including such cars as were built in railroad repair shops, and as subsidiary products by establishments engaged primarily in other lines of manufacture.

The statistics for 1919 and 1914 are summarized in the following table. These figures are only preliminary and are subject to further change.

CONSTRUCTION OF CARS FOR STEAM AND ELECTRIC RAILROADS

Total cars built:	1919	1914
Number	162,511	137,823
Value	$403,517,000	$164,960,000
Steam railroad cars:		
Number	160,159	134,960
Value	$389,078,000	$154,797,000
Passenger:		
Number	294	3,568
Value	$ 5,602,000	$ 45,245,000
Freight and other:		
Number	159,865	131,392
Value	$383,476,000	$109,552,000
Electric railroad cars:		
Number	2,352	2,863
Value	$ 14,439,000	$ 10,163,000

Air-Break Circuit Breakers on Short Deliveries

Market Is Improving but Not Due to Electric Railway Buying—Prices Lower in Some Quarters

Although the market for air-break circuit breakers can be characterized as only fair, nevertheless reports from manufacturers indicate a real upward trend in business. In general March has been better than February and April better than March, while May has started out at a still better rate than April. Much of this business, however, has resulted from intensive sales efforts and has not come by any waiting policy. The market presents a spotty tone at times rather than an even flow of business. But the total adds up fairly well, and it is felt that by fall business will have picked up considerably.

A feature of the ordering is the quick shipments that are so often required. Apparently customers have waited till the last moment to order, and generally they have been accommodated. Shipments from factory stock are commonly made, and up to two weeks is about as long as is necessary to fill a bill. Whole panels using air-break equipment seldom take more than three weeks now. Much of this air-break equipment can be stocked and some manufacturers are working toward this end.

Industrial plant buying is very quiet. Utilities are providing considerable activity, and the same can be said for hotels, apartment houses, etc., for use on either street service or isolated plant lines. For the large station boards there is little market at present. Electric railway buying both for stations and for substations is reported extremely dull.

Factory operation is well below capacity, probably 50 per cent, and overhead and labor charges are still heavy under these conditions. Raw-material prices are down considerably, it is true, but with labor entering into the breaker cost so materially certain producers have made no change in prices. On the other hand, there have this year been recessions from the peak of from 10 per cent to 25 per cent by certain manufacturers.

Special Trackwork Orders for Repairs

General Situation Quiet, Though One Large Producer Reports Improvement in Electric Railway Buying—Wage Decision Expected to Stimulate Steam Railroad Activity

Although one large producer of special trackwork in the electric railway field reports that orders show quite an improvement recently, the general situation both in the girder and T-rail trackwork markets appears to be quiet. Isolated and concentrated activity in a few sections of the country rather than a general improvement account for the increase in buying noted above. It is true, however, that street railways have been more active than steam railroads in this market of late. Orders, of course, represent pressing repair needs, for the most part, rather than new track extensions. Steam road business remains flat, though signs of an awakening activity are noted in the slightly increasing inquiries that some producers are receiving. The export market is absolutely dead in both fields.

There was a fair amount of girder and T-rail business placed around the first of the year, but since that time buying has held off despite the large potential demand that is existent. Expectations of lower prices, money tightness and need of lower labor costs are factors which have largely been responsible for this. Producers are divided as to whether an increase in demand may be expected later this year. One view holds that as this business is so largely seasonable, conditions will not improve until the spring of 1922. Others, however, are looking forward hopefully to the last quarter of this year.

This latter view finds some confirmation in the decision of the Railroad Labor Board, just announced, making reductions in the scale of pay of railway workers averaging 12 per cent effective July 1. The wages of section men are reduced approximately 18 per cent, however, and with this impetus to lower track construction costs it is not illogical to expect an increase of steam railroad activity.

Deliveries at the present time are reasonably prompt and do not seem likely to become pushed despite the fact that operation in this field is down to low levels. Special trackwork makers who do not roll their own rails are carrying comparatively low stocks but are able to replenish them as needed for steel mills can furnish rails in six weeks' or less time. Producers are keen for business and with the quality of present competition prices on special trackwork are being shaded. Deliveries of ordinary girder rail work probably average four to six weeks and T-rail orders can be filled with even greater promptness.

Five Million Street Railway Lamps Sold in 1920

Percentage Is Slightly Smaller in 1920 Than in 1919, but Total Sales Are Greater

Sales of street railway lamps in the United States during the year 1920 amounted to 3.2 per cent of the total tungsten filament vacuum type lamps sold. In 1919 the figure was 3.3 per cent and in 1918 it was 3.8 per cent. During 1920, then, of the 161,000,000 vacuum type tungsten filament lamps sold, 5,152,000 must have been street railway lamps. In 1919 about 4,719,000 street railway lamps were sold out of a total of 143,000,000 tungsten filament vacuum type large lamps.

There were 41,000,000 lamps of the gas filled type with tungsten filament sold during the year, bringing the total tungsten filament lamp sales to 202,000,000. In addition 9,000,000 carbon lamps were sold in 1920. Carbon sales now represent only 4½ per cent of total large lamp sales. In 1919 it was about 7 per cent. The preceding figures were taken from the report of the lamp committee before the National Electric Light Association in convention at Chicago this week.

Prompt Shipments Rule for Carbon Brushes

Buying of Brushes by Traction Interests Is Still Light and Stocks Are Not Being Built Up There

Manufacturers of carbon brushes quite uniformly report a quiet market for their product this spring. With industrial operation at its present low point in so many lines of activity throughout the country fewer motors are being run and fewer brushes are being bought. On the other hand, in certain lines, such as the steel industry, opportunity is being taken of slack production to overhaul electrical equipment, and there the demand for replacement brushes holds up fairly well. Electric railways are not endeavoring to carry surplus stocks, and their buying is of the hand-to-mouth order. Central-station companies at the present time are buying most nearly to their normal requirements.

There are signs of better business ahead, however; in fact, in certain quarters it is stated that the carbon-brush business in May represented an improvement over the previous three months. Producers as a rule are proceeding cautiously, nevertheless, on the supposition that the next few months may be lean ones. Production is down to 50 to 75 per cent of capacity, inventories being reduced accordingly.

Stocks of the semi-finished products are in ample shape to take care of customers, however, and shipments at present are very prompt. Prices are still at their peak except with one producer who is selling brushes at their present replacement cost, and this, it is stated, figures about a 10 per cent reduction. Other manufacturers are quoting on a price basis which has remained constant since the end of 1918.

$1,400,000 in Cars for Los Angeles

In a decision rendered June 1 fixing the fares for the Los Angeles (Cal.) Railway, the Railroad Commission of California has ordered various improvements in service. Included among these is the purchase of 132 additional cars to cost $1,400,000.

Large Fare Register Order Placed

The Philadelphia Rapid Transit Company has placed an order with the International Register Company for 2,654 single-dial registers of the R-7 type. The railway already has 2,900 registers of this type in use and the new order will bring the total number on this property up to over 5,500. The new registers will be installed on cars already equipped with cash fare registers, for the purpose of recording tickets as well. A second register was placed on each car rather than discard those already in use and substitute a double-dial register. Of the registers already in use in Philadelphia 350 were purchased in 1901 and 1902 and 2,200 in 1908 and 1909.

Rolling Stock

Pacific Northwest Traction Company, Everett, Wash., will replace all old-type cars on its lines in that city with new Birney safety cars. Several cars have been replaced and others will be added in the near future.

Track and Roadway

Ontario Power Commission, Ontario, Can. — The town of Walkerville will not press the Ontario Power Commission for any new lines on Ottawa Street and Monmouth Road as planned. By waiting a year Councillor Calderwood says the commission can save the municipalities many thousands of dollars in construction costs.

Union Traction Company, Anderson, Ind.—The Union Traction Company of Indiana has begun improvements in its track through Hartford City, Ind. The cost will be $10,000.

Boston & Eastern Electric Railroad, Boston, Mass.—The Committee on Railroads gave a hearing recently on the petition of the Boston & Eastern Electric Railroad for extension of time to April, 1924, to build and operate the railway and tunnels which were provided in the act incorporating the company in 1911. There was no opposition to the hearing.

Nuevo Laredo, Mexico.—Contract for reconstruction of the railway lines in Nuevo Laredo, Mexico, just across the Rio Grande from Laredo, Tex., has been awarded by Luis Barreda, president of the company, to H. R. Mason, of Laredo.

NEW YORK METAL MARKET PRICES

	May 4, 1921	June 1, 1921
Copper ingots, cents per lb	12.62½	13.25
Copper wire base, cents per lb	14.50	15.00–15.25
Lead, cents per lb	4.75	5.00
Nickel, cents per lb	41.00	41.00
Zinc, cents per lb	5.45	5.20
Tin, cents per lb	31.87½	31.50
Aluminum, 98 to 99 per cent, cents per lb	28.00	28.00

OLD METAL PRICES—NEW YORK

	May 4, 1921	June 1, 1921
Heavy copper, cents per lb	10.00 to 10.50	10.75 to 11.00
Light copper, cents per lb	7.50 to 8.00	8.25 to 8.37½
Heavy brass, cents per lb	5 50 to 5 75	5.25 to 5.50
Zinc, old scrap, cents per lb	2.87 to 3.00	2.50 to 2.75
Yellow brass, cents per lb	3.75 to 4.00	4.00 to 4.50
Lead, heavy, cents per lb	3.75 to 3.90	4.25 to 4.50
Steel car axles, Chicago, per net ton	14.00 to 14.50	14.50 to 15.00
Old car wheels, Chicago, per gross ton	13.50 to 14.00	13.50 to 14.00
Steel rails (short) Chicago, per gross ton	13.00 to 13.50	14.00 to 15.00
Steel rails (rerolling), Chicago, gross ton	12.50 to 13 00	13.50 to 14.00
Machine shop turnings, Chicago, net ton	5.00 to 5.50	3.50 to 4.50

ELECTRIC RAILWAY MATERIAL PRICES

	May 4, 1921	June 1, 1921
Rubber-covered wire base, New York, cents per lb	16.00	16.00
Weatherproof wire base New York, cents per lb	15.50	15.50
Standard Bessemer Steel Rails, per gross ton	45.00	45 00
Standard open hearth rails, per gross ton	47.00	47 00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	.....	.....
Rails, girder (grooved), per gross ton, f.o.b. mill	.....	.....
Wire nails, Pittsburgh, cents per lb	3.25	3.25
Railroad spikes, drive, Pittsburgh base, cents per lb	3.40	3.40
Tie plates (flat type), cents per lb	2.75	2.75
Tie plates (brace type), cents per lb	2 75	2.75
Tie rods, Pittsburgh base, cents per lb	6.00	5.50
Fish plates, cents per lb	2 75	2.75
Angle bars, cents per lb	2.75	2.75
Rail bolts and nuts, Pittsburgh base, cents per lb	4.50	4.50
Steel bars, Pittsburgh, cents per lb	2.10	2.10
Sheet iron, black (24 gage), Pittsburgh, cents per lb	3.85	3.85
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	4.55	4.55
Galvanized barbed wire, Pittsburgh, cents per lb	4.10	4.10

	May 4, 1921	June 1, 1921
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.70	3.70
Car window glass (single strength), first three brackets, A quality, New York, discount*	82%	82%
Car window glass (single strength), first three brackets, B quality, New York, discount	82%	82%
Car window glass (double strength, all sizes, A quality), New York, discount	83%	83%
Waste, wool, cents per lb	11 to 17	11 to 17
Waste, cotton (100 lb. bale), cents per lb.		
White	9.00 to 13.00	9.00 tc 14.00
Colored	7.00 to 11.00	6.50 to 12.00
Asphalt, hot (150 tons minimum), per ton delivered	33.00 to 35.00	33.00 to 35.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	33.00 to 36.00	33.00 to 36.00
Asphalt, filler, per ton	36.00	36 00
Cement, New York, per bbl	3.20	3.20
Linseed oil (raw, 5 bbl. lots), New York, per gal	.63	.78
Linseed oil (boiled, 5 bbl. lots), New York, per gal	.65	.80
White lead (100 lb. keg), New York, cents per lb	.13	.13
Turpentine (bbl. lots), New York, per gal.	.67 to .68	.65

* These prices are f.o.b. works, with boxing charges extra.

The street car tracks were partly torn up and the electric plant put out of commission by Huertistas in 1914 and the street cars of the Mexican city have not been operated since that time. The lines will be rebuilt and power plant and rolling stock put in first-class condition, it is announced.

Public Service Railway, Newark, N. J.—The Public Service Railway will pay $1,500 as its share of the proposed improvement of Belmont Avenue, Paterson, with the understanding that the company will be relieved of any further responsibility this year. The Board of Freeholders will probably take final action shortly so that bids can be solicited for the contract and the improvement begun as soon as possible.

International Railway, Buffalo, New York.—The International Railway has agreed to undertake almost $1,000,000 worth of track improvements in Buffalo immediately. There will be no extensions under the program already outlined.

Southern Public Utilities Company, Charlotte, N. C.—The Southern Public Utilities Company will superintend the laying of car track in connection with the plans of the Charlotte Construction Company to include a loop of about one mile over an area that is expected to be built up shortly with modern residences. This plan for extending the car line that now ends on East Boulevard, Dilworth, to include the abovementioned loop and acquisition of about eighty more lots in Dilworth by the Dilworth Building Company was announced recently by E. D. Latta, of the Charlotte Construction Company, and T. T. Cole, of the Dilworth Building Company.

Kitchener, Ont.—The Kitchener Light Commission announced that the street car service will be extended to the eastern limit of the city. The commission will double-track the right-of-way some time this year.

Toronto, Ont. — The Private Bills Committee of the Ontario Government passed a bill recently permitting the city to install a cable for the civic railway at a cost of $31,650.

Philadelphia (Pa.) Rapid Transit Company. — The Philadelphia Rapid Transit Company will establish a new line on Forty-second Street from Chester Avenue to Market Street. The line will replace the Hog Island line which was discontinued when the Hog Island shipyard closed.

Dallas (Tex.) Railway.—The Dallas Railway so far has not given its approval to plans offered for relieving traffic on Main Street by taking cars off this street and rerouting them on other streets. A majority of the board of city commissioners has expressed approval of the plan and the City Plan Commission has recommended that the tracks be removed from Main Street. The Dallas Railway, however, has planned to keep its tracks on Main Street as far east as Preston Street.

Galveston (Tex.) Electric Company.—The Galveston Electric Company, which owns and operates the car lines in Galveston, has been asked in a resolution adopted by the City Commission to consider the building of an extension to serve that portion of the city known as the "West End," which includes all that portion of the waterfront and industrial district back of the wharf west of Thirty-third Street. This district could be served, it is pointed out, by the construction of a line from Broadway at Forty-first Street to Avenue G, then on Avenue G to Forty-fifth Street. Raymond G. Carroll, general manager of the Galveston Electric Company, has expressed approval of the proposed extension, declaring that he believes the service can be provided at a cost of little more than $10,000.

Wichita Falls (Tex.) Traction Company. — The Wichita Falls Traction Company announces that it soon will build another extension besides the one out Indiana Street mentioned in the ELECTRIC RAILWAY JOURNAL for May 7, but the routing of the second line has not been determined upon. Announcement that these lines would be built was made with the request for withdrawal of application for franchise for another contemplated line. The improvements will represent an outlay of approximately $100,000.

Power Houses, Shops and Buildings

Petaluma & Santa Rosa Railroad, Petaluma, Cal.—The Petaluma & Santa Rosa Railroad is installing a 300-hp. motor generator set, automatic in its operation. It is situated at the top of the grade out of Petaluma at Stony Point and is to be used in assisting heavy freight trains over the hill.

Professional Note

Allan V. Garratt, hydraulic engineer, has opened an office at 176 Federal St., Boston, Mass., for consultation and advisory work. Mr. Garratt was formerly chief engineer of the Lombard Governor Company and more recently consulting hydraulic engineer to Lockwood, Greene & Company, engineers.

Trade Notes

The Exeter Machine Works, Inc., West Pittston, Pa., has recently placed on the market a new "Exeter" rotary pump (Feuerheerd Patents).

The Automatic Boiler Cleaner Company, New Orleans, La., has placed on the market a mechanical boiler cleaner for any type and size of boiler.

C. H. Wheeler Manufacturing Company, Philadelphia, Pa., manufacturer of condensers, pumps, cooling towers, etc., is opening a new branch office in Boston on June 1 at 53 State Street, Room 613.

Standard Underground Cable Company, Pittsburgh, announces its purchase of a 12-acre tract in St. Louis on which in the near future a large plant is to be erected for the manufacture of cable and other forms of insulated wire, supplementing its four other factories. A million-dollar addition is now being made to its plant in Pittsburgh.

Pacific Clay Products Company, American Bank Building, Los Angeles, Cal., will start work on a new factory at Los Nietos for the manufacture of firebrick and refractory shapes. Larger capacity will be available than in the old plant which was recently destroyed by fire, and it is expected this will be absorbed by distribution on the West Coast.

The Steel Fabricating Corporation, manufacturer of Stefco readybuilt steel buildings, announces the completion of its new works and general offices at Michigan City, Indiana, and the removal to that city from Harvey, Ill., of its executive headquarters. The new plant, with its 175,000 ft. of additional floor space, more than trebles present capacity.

P. W. Wood, formerly sales engineer, The Buda Company, has established a railway sales agency at 811 Canal Bank Bldg., New Orleans, La. Among other accounts, Mr. Wood will handle the products of the Buda Company, the Chillingworth Manufacturing Company and the Track Specialties Company. He will also handle a complete line of track, car and overhead equipment for electric railways.

Combustion Engineering Corporation, New York City, manufacturer of mechanical stokers, furnace equipment, etc., has changed the location of its Philadelphia office to tenth floor, Finance Building. This territory is under the management of W. C. Stripe. The change was brought about by the development of business which entailed increasing the sales organization and adding a new service department, thereby necessitating larger quarters. The Philadelphia office it is stated, is now in a position to render as complete service as the home office.

New Advertising Literature

Railroad Electrification.—The Westinghouse Electric & Manufacturing Company has issued descriptive leaflet 3,450, on the Hoosac tunnel electrification, completed ten years ago.

Pinions.—R. D. Nuttall Company, Pittsburgh, Pa., is sending a letter to operating men in the electric railway industry, inclosing bulletin No. 30, dealing with drop-forged steel pinion blanks.

Cutting Metal.—Haynes Stellite Company, 30 East Forty-second Street, New York City, has issued two booklets, Vol. No. 9 and No. 10, of the Stellite Reference Library, devoted to Stellite welded-tip tools and Stellite bar stock, this product being a metal for high-speed cutting tools.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

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The C. E. R. A. at Work and at Play

THE railway men who live in the territory covered by the Central Electric Railway Association are fortunate in having close at hand such wonderful recreational facilities as are provided by the Great Lakes. Moreover, they make good use of these in connection with the summer meeting of the association, to be held this year as two years ago on the good ship *South American*. To any one who has taken a C. E. R. A. boat trip, the mere name connotes several restful, sociable and informational days. Those who have not been able to do so have missed an interesting experience. This year the voyage begins at Chicago on Sunday, June 26, and ends at the same place on Friday, July 1, and not a month later than this as was inadvertently announced last week.

And there's a substantial program of papers, too—a good one. They will be read in the main salon, which makes an admirable meeting room, quiet, retired and cheery. It is easier to concentrate here than in meeting rooms of the type usually available.

After All, the Things that Count Are Results

SEVERAL incidents have recently come to attention which illustrate the importance of focusing interest on the ultimate end of an operation or process, rather than upon the means which are expected to achieve the desired results. For example, in one case a manager in referring to the head of a certain department said that he was forced to engage this man almost in spite of his prejudices because he knew that the man could do things. In another case, the head of an important department, in tracing his own career, said that he had frequently been obliged to antagonize his superiors, especially when they showed a tendency to interfere with his own prerogative, but that he had always held his job because those same superiors recognized that he could get results for them more reliably than any other man within their reach.

So much for examples of a positive character; now as to the negative side. There are far too many individuals who are so fond of their pet plans for doing things that the plans to them become an end rather than a means. The consequence is that the true end is never fully accomplished. One man comes to mind, a man with a very attractive personality and excellent educational training, who seemed to be so absorbed in systems for classifying information and people and in experimenting with new devices that he was not able to get out the work of his department in the required time. The source of the trouble would seem, in this case, to be the misplacing of emphasis as to relative importance rather than to any lack of real ability.

In considering the characteristics of various shops, way departments, power plants and the like, it is evident that in their operation these illustrate the working out of one or more fundamental principles. Those which show up the best on the whole are the ones in which the prime purpose is "results." It is not necessary to adopt that fallacious old adage, "The end justifies the means," to warrant one in keeping the end always prominently in sight.

Mr. Sprague Boosts the Joint Electrification Committee Idea

ON JUNE 2 Frank J. Sprague addressed the Traffic Club of Chicago on the general and local transportation situations. Outstanding in importance among the good points that he made was the need for some kind of a national body to study the problem of steam railroad electrification in a comprehensive way. Coming at the subject from a different direction Mr. Sprague reaches the same conclusion as that stated in the last annual report of the American Electric Railway Engineering Association committee on heavy traction, wherein the recommendation was made that the national associations concerned in railroad electrification get together in some kind of a joint committee. The committee will reiterate the recommendation this year. This paper suggested editorially, in the issue for Feb. 26, 1921, that the name "American Committee on Electrification" would be appropriate. Mr. Sprague calls the central body a "Commission," which implies a wider scope than "Committee" and fits in better with his proposition.

The idea of an American Committee (or Commission) on Electrification is the result of an evolution extending over a considerable period. Electrification of the railroads is so enormous and far reaching an undertaking that almost every important branch of engineering is involved in it to a greater or less degree. Then, of course, there are the transportation interests themselves, and, in addition, the present state of semi-management of the railroads by the federal government complicates the matter still more. All of this has resulted in extensive and increasing duplication of effort, which has worried the economy-loving engineers, and they have at least called attention to the overlap. They had in mind a co-operative movement largely among engineers. Mr. Sprague goes farther and takes in the Interstate Commerce Commission, the telephone interests and others not included in the earlier plan. There is no objection to this provided the body does not become unwieldy. With a strong and effective central organization the several divisions of the field could be handled by special sub-committees.

Mr. Sprague properly suggested that the initiative in this matter come from the American Railway Association. This is the body most vitally concerned, although the general public which needs better service, electric utilities which will sell the railroads power, manufacturers who will sell them equipment, and others are greatly interested also. Mr. Sprague does not specifically mention the American Electric Railway Association in his list, but presumably includes it by inference. This body is the vehicle through which practically all of the experience in electric traction to date can best be brought to bear on the problem of electrifying the steam roads.

Can the Nickel Fare and the Graded Fare "Come Back" Together?

NEWS items announcing decreases in street railway fares are becoming more numerous. A year ago such an occurrence was almost unheard of. Fundamental economic conditions over which the street railway companies had no control have rendered general increases in charges for transportation imperative during the last few years. The nickel fare has become almost extinct. Can it ever come back?

It has been well established by the statistics of the industry that the cost of labor, fuel and supplies, not to mention taxes and other items outside of strictly operating expenses, were more than doubled since 1914. Recent decreases have been but a small fraction of that amount. Yet only in rare instances have fares been increased proportionately. Therefore it is hard to foresee wherein there is any substantial ground for expecting a general return to the universal nickel fare in the near future. This is especially true in view of the fact that the nickel was not a very profitable rate to the majority of companies even ten years ago, though all companies then did not realize this fact.

It is not unlikely, indeed, that there are still further increases to be expected for some companies. Owing to public hostility and unfavorable franchises, some companies as yet have been unable to obtain simple justice promptly and are still seeking to secure rates which the higher costs of operation of today clearly justify. But the economic pressure appears to be receding somewhat, and there are various instances of companies reducing fares on their own initiative. Notable among such cases is the action of the trustees of the Eastern Massachusetts Street Railway, reported in last week's issue. On the many lines operated by these trustees a moderate general reduction in fares has been made coincident with a decrease in the wage scale.

To a long impoverished industry the mere mention of a 5-cent fare unit may sound too far fetched even to discuss, yet certain elements of the general public are discussing it, and one need only to pick up almost any copy of the more sensational newspapers to learn that they are "demanding" it. While it is not likely that the responsible authorities will be materially influenced by the "demands" of the unthinking and the sensation seeker, nevertheless it behooves all to be forehanded in considering these matters.

There are certain advantages to the old 5-cent nickel as a fare unit, not the least of which is the casual way the average American will spend it for a phone call, a soft drink or even a short ride on the street car, whereas he is probably a little more reluctant when the expense involves some extra pennies or the use of tickets, the supply of which he has to renew at frequent intervals at an expenditure of perhaps fifty cents or a dollar. All this leads up to a renewal of the old discussion of some system of graded fares, with the feasibility and desirability of a nickel unit for a short ride. Where a company is now operating on a fare of from 6 to 10 cents, and by means of current or future reductions in wages and other costs finds itself in a position to make some reduction in fare, but not to the extent that a universal 5-cent charge would require, the alternate plan of a low fare for a short ride with a higher fare for a longer ride is worth consideration.

While several graded fare systems have been tried in the past, rather unsuccessfully to judge by their abandonment, it is obvious that the conditions are now much more favorable for such an experiment. Previous trials have all been made on the basis of the need of increased revenue, and the zone fares as established have always meant an increased fare to many, if not all passengers. But now, when a new set of conditions may permit a modified fare system on the basis of a reduction in fares to some, if not to a majority of the passengers, the chances of a successful return along these lines look distinctly better. Such an experiment, for example, is being conducted by the Boston Elevated Railway, where a universal flat fare of 10 cents was the established rate for two years, but the company is now charging only 5 cents for short rides in several suburbs of Boston. The results of the first few weeks' operation are said to have shown an increase of more than 80 per cent in the class of riders affected. While it is pointed out by the general manager of that company that an increase of 100 per cent would be necessary to give the company the revenue formerly received at the 10-cent rate, nevertheless this remarkable percentage of increase is clearly indicative of the possibilities of stimulating short haul traffic by means of 5-cent fares.

The Committee on Elimination of Waste Makes Some Suggestions

MUCH has been said in the past about the waste prevalent in America, but the reference has usually been to the waste of national resources. That industrial America has also been a spendthrift—indeed, highly inefficient in its methods—will be a surprise to some. Nevertheless this is the charge of a committee of the American Engineering Council which declares that the aggregate of the losses at least theoretically preventable runs into billions of dollars yearly. This report was presented to the Council on June 3 and its publication was authorized not as a report of the Council but as the findings of the committee. A brief summary of some of the points covered is published in this issue.

It is somewhat remarkable that in spite of the progress made in industry in many directions, the methods of engaging labor and recompensing it differ but little from those practiced in the early days when men first began to hire their services to others. Methods by which the employer who needs a certain kind of labor can be brought in touch with the man who can supply that particular kind of labor have not greatly improved. The same can be said in regard to the determination of the peculiar adaptability of the man to the work to be undertaken and the prevention of his discharge because of seasonal or other changes in the demand for the product, preventable diseases, idleness through strikes and other causes. For some of these conditions the employer is to blame, for some the employees, but for the most the cause is conditions which community sentiment and intelligence only can overcome.

The electric railway industry should profit both directly and indirectly by any comprehensive plan for increasing the efficiency of labor, reducing unemployment and otherwise increasing output. The indirect advantages include lower cost of living and greater prosperity for the community, and this necessarily means more riding. The direct advantages of increased labor efficiency are those which would apply in any business, namely, greater output per unit of cost.

The report is particularly interesting because it is an examination by an engineering body of a subject which usually has been approached not from the engineering but from the sociological side. The characteristic of engineering reports is that they deal with things in a concrete way, with definite figures, quantities and values. The committee has evidently made an effort to extend engineering methods to this particular study, and its remedies partake of an engineering nature. Thus it urges the extension of the engineering idea of standardization to such industries as the ready-made clothing industry and the printing industry, the compilation and dissemination of statistics relating to unemployment and employment needs, the scientific study of the adaptation of laborers with certain defects to their most suitable tasks and an effort to secure a reduction of seasonal fluctuations in output. The electric railway industry is founded on engineering, and the success of any attempt to extend engineering methods to other industries will be watched with interest by railway men.

The Value of Adequate Records Is Strikingly Emphasized

ONE of the principal contributing factors in minimizing the expense of the valuation of the property of the Connecticut Company by the Connecticut Commission (see ELECTRIC RAILWAY JOURNAL, May 21 and 28) was the fact that the engineers of the commission were able to base much of this work on the records of the company. This is certainly evident from an examination of Mr. Knowlton's analysis of the valuation. As remarked in the May 28 issue, this was not a weakening of the method but rather a strengthening, and it is most certainly a telling argument in favor of railway companies keeping their property records in such form that they will lend themselves to an easy and accurate analysis of the entire physical plant.

The problem of keeping property records and accounts has never been solved to the satisfaction of all who have ideas on the subject and probably never will be, but it is certainly evident that material progress has been made since the value of some sort of record began to be appreciated. Usefulness in possible, or probable, valuations is by no means the only reason for keeping such records, though the money saved for the company, in addition to that saved by the state, in one valuation might conceivably cover the entire cost of keeping the records in such shape as to be useful in such contingency. Certainly, in the continuous maintenance and reconstruction of the property of a system of any size, detailed records should prove invaluable, especially in the case of changing personnel where previous records are the only source of information to new officials.

Returning to the use of adequate records in valuation proceedings, it can hardly be denied that an accurate and up-to-date record of physical plant is a strong argument for a commission's engineering staff to use company data at a great saving of expense to all concerned. On the whole, it should be much more accurate in most details than any field inventory could ever be. In the case of track, ties, ballast and pavement, wire sizes, even, special trackwork and many other items, a record of what was installed and still exists gives more information than can easily be obtained by field examination.

Company and commission co-operation in making valuations, among other things, is getting to be more and more common. Ideas for making this co-operation most effective and mutually advantageous should therefore be welcome. In this case the concrete evidence of the value of complete records should be an incentive to railway executives to investigate their own record system with a view to its completeness and its usefulness and value in dealing with commissions and others.

Some Electrification Object Lessons from Abroad

IT HAPPENS, at the moment, that the focus of interest in electrification is shifted away from the United States to foreign lands. Although comprehensive plans are in preparation here and much important work will be done within a few years, little actual electrification can be carried out until the railroad situation clears a bit. Meanwhile a high-grade pioneer installation has been made in Brazil on which operation will soon begin, construction work is being pushed in Switzerland, and in England, and on the Continent of Europe nation-wide plans are being made. India and South Africa are also being heard from. The reduction in the cost of coal there, together with scarcity of funds, has acted to slow up the actual placing of contracts, but the urgency of early adoption of electric power is still keenly felt.

These circumstances render peculiarly timely the publication this week of several articles containing first-hand information of the Paulista electrification and the situation in Europe. From these it is evident that the electrified railroads in this country are largely in the lead in this field. The Paulista has adopted American apparatus and methods, so that the installation on its Campinas-Jundiahy section can hardly be considered foreign.

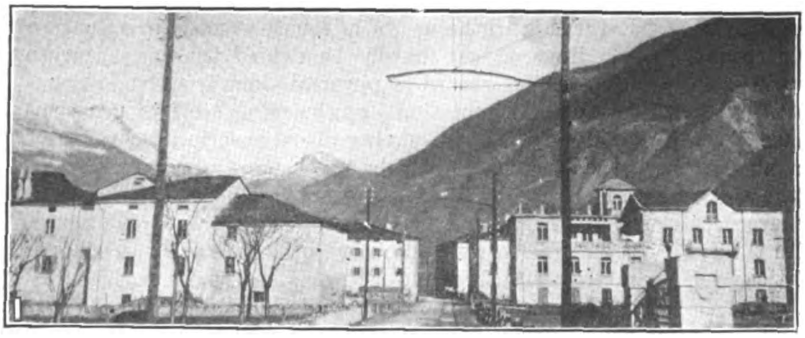
Across the Atlantic operating conditions are so different from those in the United States that comparisons can only be made with difficulty. However, able engineers and transportation men are vigorously at work there and real progress is being made. Their solutions of their problems will be of service here. And they are learning that the most economical carrying of at least certain kinds of freight involves the use of heavy tonnage trains.

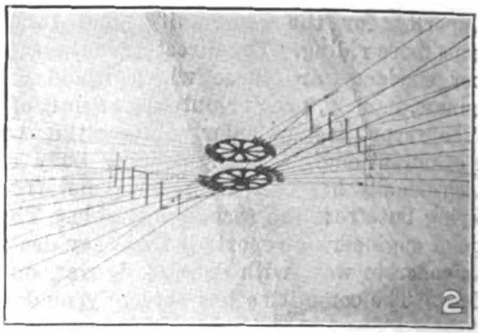
Quotation from the Federal Electric Railways Commission Report

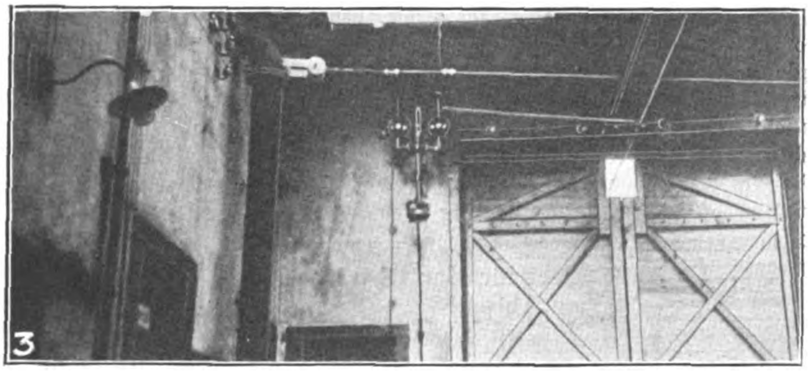
No. 24

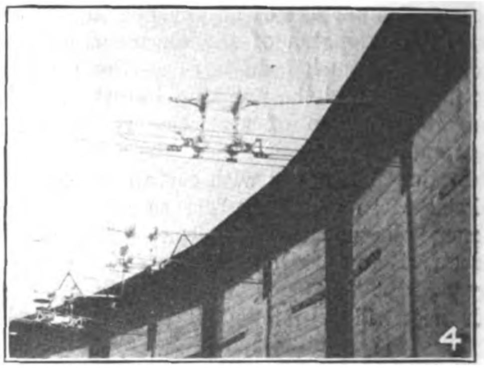
THE undisputed testimony favors an indeterminate franchise by which the company is permitted to operate subject to the right of the public to take over the property by paying its value or agreed price. Such contracts protect both the investment against confiscation and the public against extortion by providing for payment of just compensation for the use of the property. The indeterminate franchise has been most thoroughly developed in the State of Wisconsin, and it has been recognized in the District of Columbia and the States of Indiana and Massachusetts. Its earlier adoption by other states and communities would have prevented many conflicts and misunderstandings. We believe that this form of franchise should receive the favorable consideration of the public.

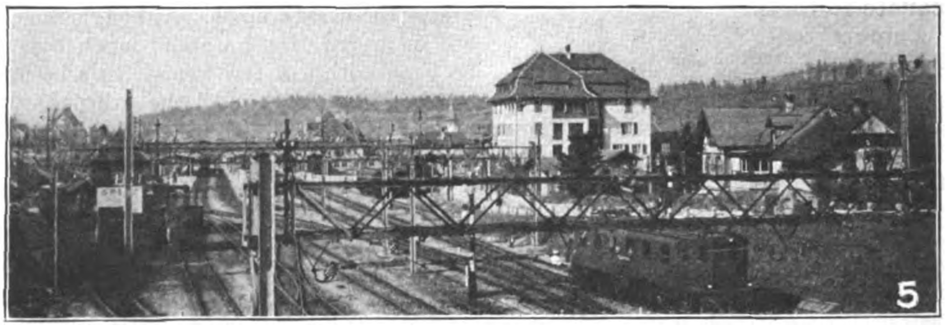
Features of Overhead and Other Electrification Details in Switzerland

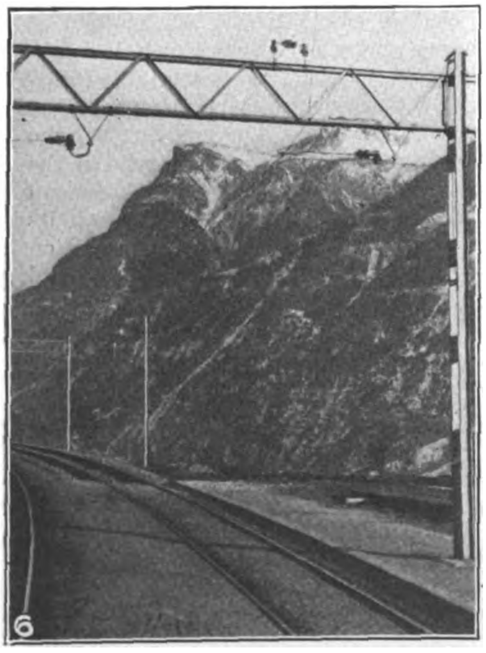


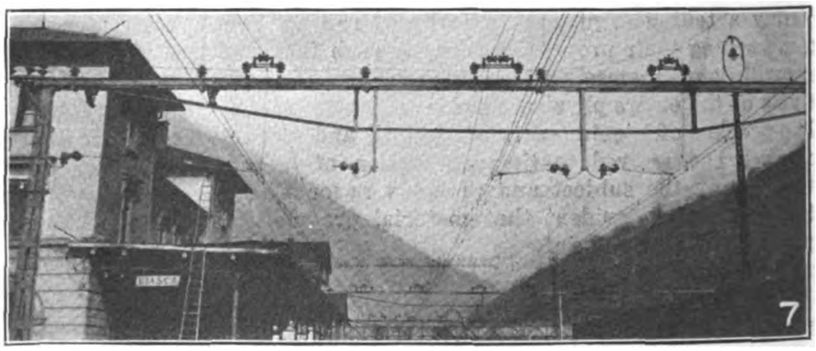


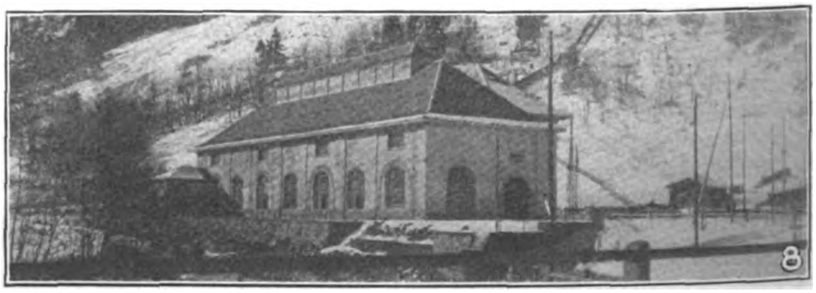












1—Some 750-volt, direct-current trolley construction on Bernina Bahn.

2—11,000-volt trolley over turntable in roundhouse, Landquart, Rhätische Bahn.

3—11,000-volt switch in roundhouse at Landquart, connecting across section break shown in the following figure.

4—11,000-volt trolley anchor and section break at roundhouse door.

5—15,000-volt, single-phase locomotive and yards at Spiez, Lötschberg Railway.

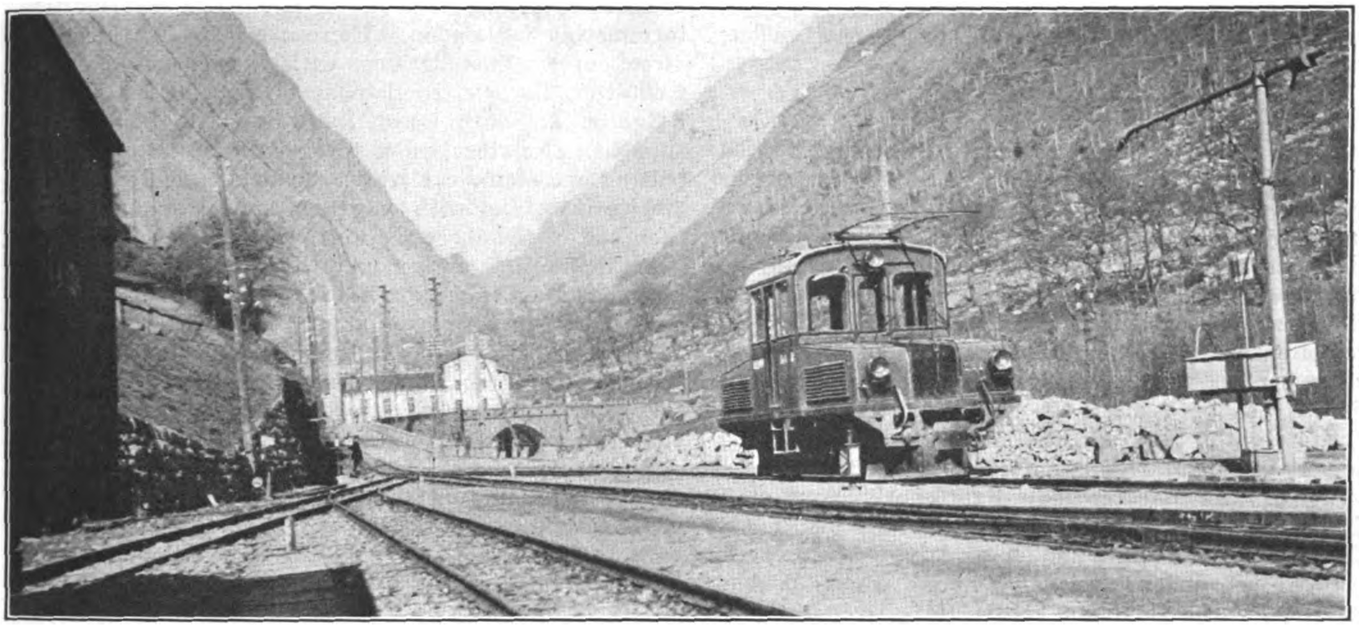
6—11,000-volt, single-phase trolley construction at station, Rhätische Bahn.

7—15,000-volt, single-phase trolley construction at Biasca, St. Gotthard Line.

8—Hydraulic power plant at Kandergrund, which under 985-ft. head generates 15,000-volt, 15-cycle, single-phase power.

Railway Electrification in Europe

BY J. V. DOBSON AND F. E. WYNNE*



A 250-HP., 5,000-VOLT, 20-CYCLE, SINGLE-PHASE LOCOMOTIVE ON THE LOCARNO-PONTEBROLLO-BIGNASCO RAILWAY, SWITZERLAND

The Authors, Recently Returned from a First-Hand Study of Transportation Conditions in England and on the Continent, Have Set Down Their Impressions of Present Practices and Tendencies in This Field—They Summarize the Points of Difference Between American and European Railway Usage

A FEW months ago the writers had occasion to make a trip through the European countries in which railroad electrification has made substantial progress or in which there is a promising field for development in this line. In the course of their travels, covering a period of two months or more, they visited England, Norway, Sweden, Germany, Switzerland, Italy and France. Some observations made on the tour are set down in the paragraphs below. Before taking up in detail the conditions noted in the several countries respectively, a summary of some of the points of novelty in railway practice, considering the trip as a whole, may be of interest. These items refer to practices noted in one or more places. They do not necessarily imply general tendencies.

SOME TRANSPORTATION FEATURES THAT ATTRACTED ATTENTION

The points of detail which we noticed particularly were these:

1. The double-deck street car for large cities.
2. The bow trolley for street cars.
3. Ball and roller armature bearings for street-car motors.
4. Rheostatic braking for street cars and locomotives.
5. The system of zone fares.
6. The three-car unit for suburban service.
7. Control equipment mounted within the car body.
8. Separate generators and transmission for heavy railway power supply.
9. Low frequency for alternating-current motive power.
10. Fifteen thousand volts on single-phase contact lines.
11. Four-thousand-volt direct-current system.
12. Tension devices, automatic or semi-automatic, for overhead contact lines.
13. Oil-cooled transformers on single-phase locomotives.
14. Regenerative braking on single-phase locomotives.
15. Manually operated control of locomotives.
16. Plate frames for locomotives.
17. Rod drive for moderate speeds.
18. Light axle-loading on cars and locomotives.
19. Light draft gear on cars and locomotives.
20. Strict observance of specified limits in loading and speed of locomotives.
21. Passenger train-heating plant not carried on electric locomotives.
22. Quality of workmanship in both manufacture and maintenance.
23. Track rails supported in chairs.
24. Permanent character of roadway structures.
25. Artistic designs of railway buildings.
26. Light-weight cars, freight and passenger.
27. Open-top freight cars for all kinds of loads.
28. Freight cars with brakes for holding only.

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*Mr. Dobson is section engineer, alternating-current railway motors, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., and Mr. Wynne is manager of the railway equipment engineering department of the same company.

29. Freight cars with hand brakes only.
30. Vacuum brakes.
31. High speed of freight trains.
32. Side door compartment type passenger cars.
33. Ticket retained by passenger throughout journey.
34. Strict enforcement of laws against trespassing.

The inclusion of a practice in the above list does not indicate an opinion that it is adaptable to American conditions. Many of them, however, deserve serious consideration.

ENGLISH RAILWAYS ARE WELL BUILT

One of the most noticeable features of the English railways is the excellence of the roadbed. The track is well ballasted and well drained. The rails are carried on chairs and held tightly by wooden wedges between one side of the chair and the rail. There are practically no grade crossings, the roadways usually being carried on bridges above the railway track. Where these bridges are not entirely of stone, they are supported from heavy masonry piers with masonry wings for retaining the fills on the approaches. Of course, the roads are on private right-of-way, and the laws against trespassing are very strict and rigidly enforced.

The cars are of exceedingly light construction, most of them having only four wheels and two independent axles. Some of the later and longer cars have six wheels on three independent axles, and there are some double-truck cars. The maximum capacity of a freight car is approximately 20 long tons. The majority of the freight cars are not equipped with brakes except for holding when standing on a grade, and these brakes are set up by the crew passing along the side of the train and throwing them to the desired position. Others of the cars are provided with hand brakes operated from a small cab on the end of the car. Standard Continental couplings are used, consisting of hooks and links. Except in a few cases, the maximum working drawbar pull for this type of coupling is approximately 38,000 lb. Many of the cars are similar to our gondola type without tops. Freight which might be damaged by the weather when loaded in such cars is protected by tarpaulins drawn over the top of the load and down over the car sides. This practice greatly facilitates the loading and unloading of cars and was found to be a valuable factor in securing the rapid movement of freight during the war.

COMPARTMENT CARS ARE STANDARD

Passenger rolling stock is, of course, of the compartment type with side doors. At present, the railways are giving only first class and third class service. The cars used for third class service have the compartments extending all the way across the car with a door opening from each side. Those used for first class service have a corridor running down one side of the car, one door from each compartment opening into this corridor, and the other door located in the opposite side of the car.

In both passenger and freight service the train weights are small in comparison with those common in American main line traffic, but the speeds are high. A great many passenger trains are operated at speeds comparable with our fastest trains and the average freight train speed is considerably above ours. Interesting features of steam locomotives are the protected drivers, the use of inside rods and cranked axles, low fire boxes and small coal bins, particularly on switching engines.

In England there are no heavy electric locomotives. At present the Northeastern Railway is designing a trial locomotive of the 4-6-4 type which will weigh approximately 105 long tons with a one-hour capacity of 2,500 hp. and a maximum speed of 90 m.p.h. This engine will have quill drive, designed after Westinghouse practice, and will be given its preliminary test on the 1,500-volt, direct-current Shildon-Newport line.

There is a large amount of suburban electrification terminating in London. These are 600-volt, third-rail, direct-current installations, with the exception of the 6,600-volt, 25-cycle, single-phase system of the London, Brighton & South Coast Railway. The tendency in suburban electrification is toward three-car units, comprising one motor car with a quadruple equipment and two trailers, and with only two control stands, one at each end of the three-car unit. In the motor cars, the general practice is to mount the control equipment in a compartment immediately back of the motorman's cab and to have a baggage compartment just back of the equipment room. Generally, doors are provided between the equipment room and both the motorman's cab and the baggage compartment, providing ready access to the electrical apparatus for inspection and repair.

The preference of railway engineers seems to be for electro-magnetic control rather than electro-pneumatic. This is influenced greatly by the brake situation as vacuum brakes are much more common than the compressed air brakes.

SINGLE-PHASE OVERHEAD ON LONDON, BRIGHTON & SOUTH COAST RAILWAY IMPROVED AS TO FLEXIBILITY

On the London, Brighton & South Coast Railway the overhead is the double catenary type similar to the initial installation on the New York, New Haven & Hartford Railroad, although somewhat lighter. Recent modifications of the initial construction include: (1) The securing of flexibility by means of clips having stems passing through openings in the fittings at the bottoms of the hangers, thus permitting free vertical movement. (2) The omission of the horizontal member of the triangle which initially connected the two messenger wires.

This company has also devised a method of satisfactorily using the spool type of insulator, which at first gave trouble. The scheme is to mount the spool on a metal sleeve with tow between the spool and the sleeve and having the supporting member passing through the sleeve. The tow gives a cushioning effect, permitting unequal expansion of the porcelain and metal without producing destructive strains in the porcelain.

The London & Northwestern Railway, in combination with the Bakerloo Tube, gives a combined subway and suburban service, each of the railways furnishing part of the equipment. This is a very convenient scheme for suburban passengers living along the line of the North-Western, as they get direct service from down town to their own stations. One of the first features of street traffic noticed in England is the general use of double-deck cars, some of which have the upper deck inclosed, while others have the open upper deck similar to the bus. The bus service in London is really remarkable for its convenience, frequent service, speed and amount of traffic handled.

After observation of the operation of these vehicles through the crowded, crooked and hilly streets of London, it is evident that they give a class of service which could not possibly be approached by street cars.

As an indication of their flexibility, one frequently notices at street crossings, where the street is wide enough, three or four of these buses drawn up, side by side, waiting for the traffic officer's signal to go ahead. This is a great advantage over the necessary series position of street cars under similar circumstances.

In addition to the gasoline buses, there are now a number of gasoline-electric buses of somewhat larger capacity and which may prove to be more economical than the straight gasoline vehicles.

NORWAY IS RICH IN POWER

There are several interesting electrified railway propositions in Norway. Leaving Bergen, the Christiania-Bergen line of the Norwegian State Railways follows along the mountains beside a fjord for some distance and then continues to climb up the west slope of the main backbone of Scandinavia. The road is crooked and steep and passes through many tunnels and snowsheds. In the more rugged part of the country the roadway is not fenced. The condition of track is fair, although not to be compared with that of most English railways.

Of course, it is more difficult to maintain a good roadbed in Norway than it is in England, because the former country is subject to much wider temperature variations and a great quantity of snow.

The structures, bridges, tunnels and snowsheds along the right-of-way are of substantial character. Cars and locomotives are of the standard light construction used throughout Europe.

The traffic is comparatively light, as is indicated by the fact that only two passenger trains each way daily are operated between Bergen and Christiania. It is proposed to electrify at least the mountain section of this line as soon as it is convenient to finance the project. The features which tend to promote electrification throughout Scandinavia are that all coal must be imported, and there is abundant water power which can be readily developed. The total available water power is said to amount to 4 hp. for each inhabitant of Norway and Sweden. It is thought that the density of traffic is insufficient in itself to justify electrification.

In Christiania the street cars are mostly of the single-truck type with hand control and bow trolley and operate at the usual city speeds. The operation of the bow collectors is excellent and this is noticeable wherever this form of collector is used for street car service in Europe.

An interesting suburban installation is the Holmenkollen Railway, which starts in the outskirts of Christiania proper at a station having special provision for handling enormous crowds during week-ends and on holidays. These cars are equipped with Westinghouse motors and HL control built at East Pittsburgh. They are large, double-deck, center-entrance cars of modern design. A novel feature of these cars is that the outside is provided with hooks and straps for transporting up the hill the sleds and skis of the passengers who use these primitive vehicles for the descent by way of a steep, crooked, picturesque forest course. The regular schedule on skis is 7 miles in eight and one-half minutes.

The Christiania-Drammen line of the Norwegian State Railways is now being electrified for operation at 15,000 volts, 15 cycles, single-phase, with locomotives having side rods and geared series motors. The overhead construction will be practically the same as that which has proved its excellence on the Kiruna-Riksgränsen line of the Swedish State Railways. Power will be secured from a hydraulic plant which is one of a number to be included in a general plan of electrical generation and transmission. Probably the next step in Norwegian electrification will be the line between Riksgränsen and Narvik, 25 miles of continuous 2.6 per cent grade.

The principal traffic will be handling the cars loaded with iron ore down the grade to Narvik, which is an open port all the year, being under the influence of the Gulf Stream. At Narvik, the trains are run out on an elevated structure where the ore is dumped into vessels for transportation to England and western German ports.

It is probable that regenerative control will be required on the locomotives for this service. The general impression received in Norway is that their electrification will proceed under the guidance of competent engineers as rapidly as the necessary funds can be secured.

OVERHEAD CONSTRUCTION WELL DEVELOPED IN SWEDEN

Railway service between Stockholm and Riksgränsen is given three times per week by a mixed passenger, baggage, mail and freight train.

This railroad employs the European standard equipment. The road is good, the structure substantial and the speed moderate. The electric zone now extends from Riksgränsen to Ripats, 155 miles, and is being prolonged from Ripats to Lulea, 115 miles. The hydraulic plant at Porjus, located 34 miles from the main line, furnishes all the electric power in northern Sweden. This novel power house has been described previously in the ELECTRIC RAILWAY JOURNAL.

The present development comprises four 12,500-hp. turbines, two of which drive single-phase, 15-cycle generators, one drives a 25-cycle, three-phase generator and the fourth drives two spare generators, one of each frequency.

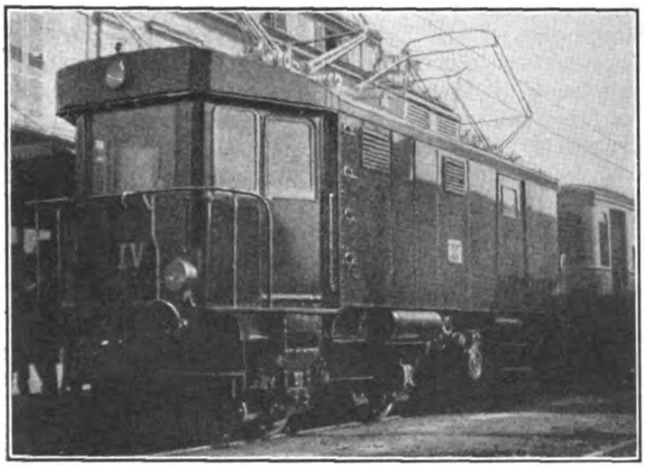
This power house is being extended and development is under way to provide for a total of 60,000 hp. at this point. The most impressive feature of the entire power station is the great amount of space; nothing is crowded and clearances are ample. This is true of the substations also. A novel feature is that all the control wiring of the power house is lead covered and carried on open racks just under the ceiling of the lower rooms.

The three-phase power is transmitted at 70,000 volts for industrial purposes. The single-phase transmission for railway service is at 80,000 volts with the middle point grounded.

In the design of the transmission lines, more than normal sag is provided for the purpose of keeping the stresses within reasonable limits under the wide temperature variations and the great weight of frost frequently present during the winter.

The trolley line construction is a remarkably good piece of work. The supports are light structural steel poles on open line and similar bridges in yards. Foundations are concrete. Insulators throughout are porcelain. All fittings are bronze. Both contact wire and messenger are copper, as are the flexible hangers.

The line is divided into sections averaging about 0.85 mile in length. Contrary to American practice, the sections are not anchored, but at each end the trolley and messenger are brought together and carried over pulleys to movable weights running in guides in the



A 55-TON, 560-HP., 4,000-VOLT DIRECT-CURRENT LOCOMOTIVE ON THE TORINO-CIRIE-VALLE DE LANZO RAILWAY, ITALY

special poles at these points. The bracket arm consists of three members arranged in form of a Z, supported at the left on two pin-type insulators and at the right supporting the messenger and trolley. The insulator pins are free to rotate about the vertical axis. The entire construction is light, flexible and reliable and its record indicates its suitability for the severe climatic conditions. In eight years of service there have been only four cases of broken trolley wires, although the temperature varies from plus 100 deg. Fahr. to minus 70 deg. Fahr., and the frost on a single wire at times weighs 1 lb. per yard.

The maximum wear on the contact wire occurs where the overhead changes grade relative to the plane of the track and shows a maximum flat of less than 0.1 in. This construction could be studied with profit by American engineers and deserves a service trial. If successful under our conditions, it would assure great economy in one of the most expensive elements of railway electrification.

Following exhaustive studies, which were begun prior to the electrification, and experimental variations in the system of distribution during operation, the Swedish engineers have concluded that the best way to correct interference in the parallel communicating circuits along this line is to use track transformers in conjunction with stub-end feed each way from each substation, the track as well as the overhead being sectionalized between substations.

The freight cars and trains on this road are the heaviest operated electrically in Europe. The double-truck ore cars weigh over 12 short tons each and have a capacity of 39 short tons, which gives a loaded car weight comparable with that of many American box cars. These cars are made up into trains of 1,500 to 2,000 tons and operated over a rolling profile with a maximum grade of 1 per cent. The line electrification is being extended to the East and in this direction loaded trains will be moved with the aid of a helper up a maximum grade of 1.6 per cent. Several types of locomotives are in service, the largest weighing about 138 tons and having a maximum starting capacity of 2,500 hp. The draw-hooks of these cars and locomotives are special, being heavier than the standard Continental type and good for a maximum operating pull of 55,000 lb. This seems small in comparison with our draw-bars, but is a substantial advance beyond general European practice.

To provide steam heat for passenger cars of the electric zone, a special car carrying the heating equipment and supply of fuel and water is attached to the train. Thus, the electric locomotives are relieved of the handicaps incident to carrying train-heating equipment in the locomotive cab, which has been American practice.

It is interesting to note that on this railway the motive-power department can order a locomotive off the road for inspection or repairs without regard to the demands of the transportation department.

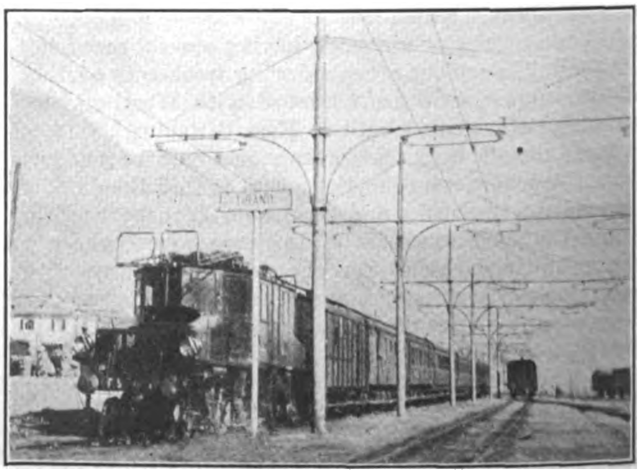
The impression produced by inspection of the Swedish State Railways electrification is that their engineers have carried through a large amount of valuable research and original design, and further notable contributions to the art of railroad electrification may be expected from this source. It is likely that the next electrification undertaken will be from Stockholm to Gothenburg.

GERMAN DEVELOPMENT HAS BEEN DORMANT

Although considerable work has been done in the last two years toward getting the German roadbeds and equipment in workable condition again, they are yet in great need of repairs. Much progress has been made in rebuilding locomotives, a large part of such work being done in the locomotive shops of electrical manufacturers. The car repairs have not been so extensive, being largely confined to the trucks; the bodies need paint, windows and doors are loose, and many of the fittings are rough iron where they were originally brass or copper. On some electric lines, the trolley wires, which were removed several years ago, have been replaced and electric service has been resumed.

Apparently, electric railway development until recently has been dormant since 1914. Some locomotive orders taken in 1913 are just being completed substantially in accordance with the original designs. However, it is noteworthy that these locomotives have commutating-pole, series, single-phase motors. This general type in a variety of forms is now the standard single-phase railway motor of Europe. There are no high-voltage direct-current railways (3,000 volts or more) in Germany. For street car service both split and box-type motors are being manufactured, but the tendency is to standardize on the box type as has been done in America.

Armature bearings of the roller type are popular and for the very small railway motors there is a tendency toward ball bearings. The inspection of several types



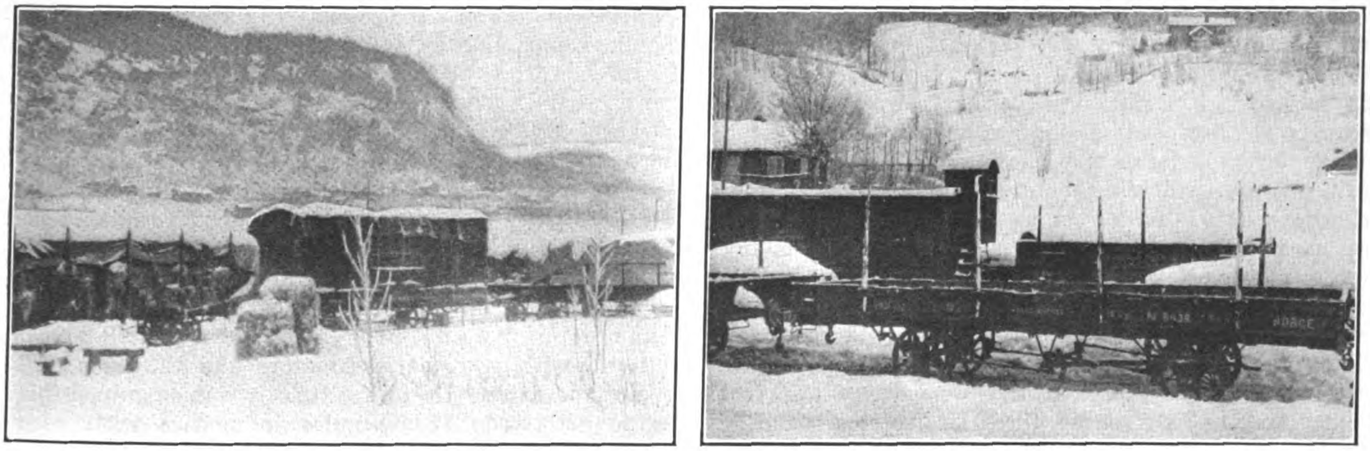
TYPICAL 3,300-VOLT, 3-PHASE LOCOMOTIVE AND OVERHEAD CONSTRUCTION, ITALIAN STATE RAILWAYS

of locomotives under construction indicated that cab construction, equipment layout, motor mounting and method to drive are yet considered to be in the experimental stage and subject to much further development. The impression gathered from seeing the quantity of railway equipment now building, and the diligence displayed by the workmen, is that German competition with all other countries will be very keen in the near future.

ELECTRIFICATION WORK IS ACTIVE IN SWITZERLAND

Switzerland is particularly interesting, not only on account of its magnificent scenery but also because of the extent to which its railways have been electrified. The locomotives and cars are well built and maintained and the roadbed is good. Throughout Europe the great pains taken to build for permanence is striking, and in Switzerland this is emphasized by the enormous amount of labor required to overcome the natural handicaps to railway construction.

The mountainous nature of the country, of course, makes it necessary to build the railways with many grades, long and steep. The result is that no especially high speeds were observed; but on the other hand, the speeds of both passenger and freight trains on the heavy grades are higher than in America. For instance, on the Lötschberg Railway the regular speed up a grade 50 per cent steeper than that on the Pennsylvania Railroad from Altoona to Gallitzin is 35 m.p.h. and on the 3.5 per cent grade of the narrow-gage Rhätische Bahn the up-hill speed is 20 m.p.h. Another result of the ruggedness of the country is that the only way grades can be kept within reason in many places is by winding back and forth up the side of a mountain, constructing spiral loop tunnels within the mountains, and crossing back and forth between the sides of the gorges. On the St. Gotthard line of the Swiss Federal Railways there are seven spiral tunnels between Erstfeld and Bellinzona, a distance of 68 miles. On the Rhätische Bahn much of the track is located on benches cut in the vertical mountain sides.



TWO VIEWS SHOWING TYPICAL FREIGHT CARS AND LOADING IN NORWAY

On the Bernina Bahn a straight line will cut the track in nine places on the south side of the Alps and six of these levels may be seen from one point, the other three being higher up and on the other side of the mountain's nose. On this line the longest grade is 7 per cent for 20 miles. On light-traffic lines rack railways are used with grades up to 25 per cent, while the cable roads for tourists are on a grade of 55 per cent in places.

Long tunnels are numerous, the Simplon (13 miles) being the longest in the world. This will ultimately be a twin tube tunnel. The second bore is now approaching completion.

Most of the Swiss railway electrification is at 15,000 volts, 15 cycles, single-phase. However, between Bergdorf and Thun there is a three-phase line with locomotives and motor cars. The Rhätische Bahn is an 11,000-volt, single-phase line. The Bernina Bahn operates at 750 volts direct current, entirely with motor cars (with magnetic track brakes) and trailers, except for one freight locomotive. At Locarno there is a light railway, 20 cycles, single-phase, which has been operating for fifteen years. It uses 800 volts on the trolley in town and 5,000 volts in the country. The collector is a whip of pipe section, operated by a clock type spring and does very well at the low speeds.

Of course, all of the later installations use the catenary type of overhead. That on the Lötschberg Railway and Rhätische Bahn is heavier than the Swedish construction, but somewhat lighter than ours, while the St. Gotthard Line uses a light form of compound catenary and rather heavy supports, more comparable to American practice. All three of these roads use semi-automatic tension in the overhead; that is, the messenger is anchored at the ends of sections and the trolley alone is attached to the weights.

A noteworthy feature on both the Lötschberg and St. Gotthard is that the power-house generators are wound for 15,000 volts and feed directly into the trolley line, as well as through substations.

The locomotive equipments in use have nearly all been supplied by the Oerlikon and Brown-Boveri Companies, and the mechanical parts by the Swiss Locomotive & Machine Works. The locomotives are of various types of wheel arrangement, and all but one have some form of rod drive. Although the single-phase locomotives are all operated with low-frequency power, they are quite free from vibration and quiet in operation. This is largely due to the excellence of their mechanical construction and maintenance. Rod bushings, pins and bearings are made accurate initially and are set up with very small tolerances. Further, they are maintained in good condition. The maintenance cost is reasonable, if one may judge from the small number of men in the shops.

It is interesting to note that resistors for dynamic braking are located on the locomotive roof and give satisfaction in spite of the severe climatic conditions.

Switzerland has embarked on a definite program of electrifying all main lines on account of the scarcity of fuel and abundance of water power. The next step now under way is the line between Zurich, Lucerne and Erstfeld. Swiss engineers seem well satisfied with the gear-and-side-rod type of drive for freight and moderate-speed passenger service. For higher speed passenger service on the lines with easy grades two types of locomotives with independently driven axles are now under construction and both types will have quill drive.

ITALY IS STRONG ON THREE-PHASE

We entered Italy by way of the Bernina Bahn on Sunday, encountering a recent innovation in railway rates. In common with those of other countries, the Italian Railways have had difficulty in securing enough revenue to meet expenses. The deficit is now being decreased by charging 20 per cent excess fare for Sunday travel.

The most extensive electrification in Italy is that of the State Railways at 3,000 to 3,700 volts, 15 to 16⅔ cycles, three-phase, using double trolley with induction motors. At present the roadbed and cars are in poor condition, both maintenance and operation suffering from the difficult labor situation, but the locomotives are well maintained.

This system has in operation and on order a total of 222 locomotives. Although various forms of wheel arrangement are used, all engines have rod drive. Line voltage is applied direct without transformers to the primaries of the driving motors. For speed variation, pole-changing or cascade connections, or both combined, are used. These locomotives are notable as having greater power per unit of weight than any other electric locomotives built to date.

Some locomotives are equipped with liquid rheostats, while others have metal resistors. In general, the acceleration is smooth and the locomotives are free from vibration. Of course, these locomotives brake by regeneration automatically on down grades. As severe grades are numerous in the electrified zones, this feature is a valuable asset.

The double overhead construction is a handicap to this system. Originally direct suspension was used for the trolleys, but later installations employ catenary suspension. With the direct suspension construction, it has been found necessary to replace the contact wires in tunnels every three years and on open line at the end of nine years. Maximum wear occurred at the hard spots formed by the suspension clips. Although the double overhead construction is expensive and complicated, its operation and that of the pantograph collectors are successful at 3,300 volts. It is proposed to continue the electrification of the State Railways in the north of Italy with this system on account of the many heavy grades. For southern Italy, where service conditions are much easier and where 42 cycles is the prevailing frequency, plans are under way for experimental lines with both high voltage, direct current and 42-cycle, three-phase power.

The results obtained on these experimental lines will serve as a guide in selecting the system for the south of Italy.

Since the first of this year the Torino-Cirie-Valle de Lanzo Railway has been operating three 55-ton (2,000 lb.) 560-hp. truck-type, box-cab locomotives with axle-mounted geared motors and manually operated control from a 4,000-volt, direct-current trolley fed by a 1,300-kw. substation located at Cirie.

The driving motors are grouped two in series and the groups arranged for series-parallel operation and rheostatic braking. In addition to providing two enginemen's compartments and housing the control and auxiliary equipment (excepting compressor), the box cab also has space for a small baggage compartment. The motors have natural ventilation and the resistor is cooled by a fan driven by the motor-generator which supplies low-voltage current for the compressor and lights.

The service given comprises sixteen passenger and eight freight trains daily. The total train weight is 121 short tons. Initial operation has been very satisfactory. Minor defects which appeared in the motors have been corrected and some of the switching apparatus has been modified. Twenty-five short circuits on the trolley line have failed to flash the power generators, even when occurring in front of the substation.

LARGE PLANS FOR ELECTRIFICATION IN FRANCE

In France the Paris-Orleans Railway has a number of 600-volt, direct-current electric locomotives of the double-truck type with axle-hung motors, operating out of Paris. Some of these locomotives have box cabs with baggage compartments, and others have the steeple type of cab, seven of the latter having been in service for twenty years. The performance of these locomotives has been very good. They are inspected once a week, and at the end of 20,000 miles are out of service three days for overhauling. The life of motor windings is ten years, which is an evidence of the good results to be secured in general from electrical apparatus by imposing upon it only such duty as is within its capacity.

This railroad has recently placed in service the first of an order of five 1,800-hp. locomotives of the 2-8-2 type, equipped with two gearless motors and the open "V" type of rod drive. Up to the time it was examined this engine had made 12,000 miles in service with good results. Field control motors are used and a novel feature of this equipment is that the short field connection is controlled by a separate handle on the master controller.

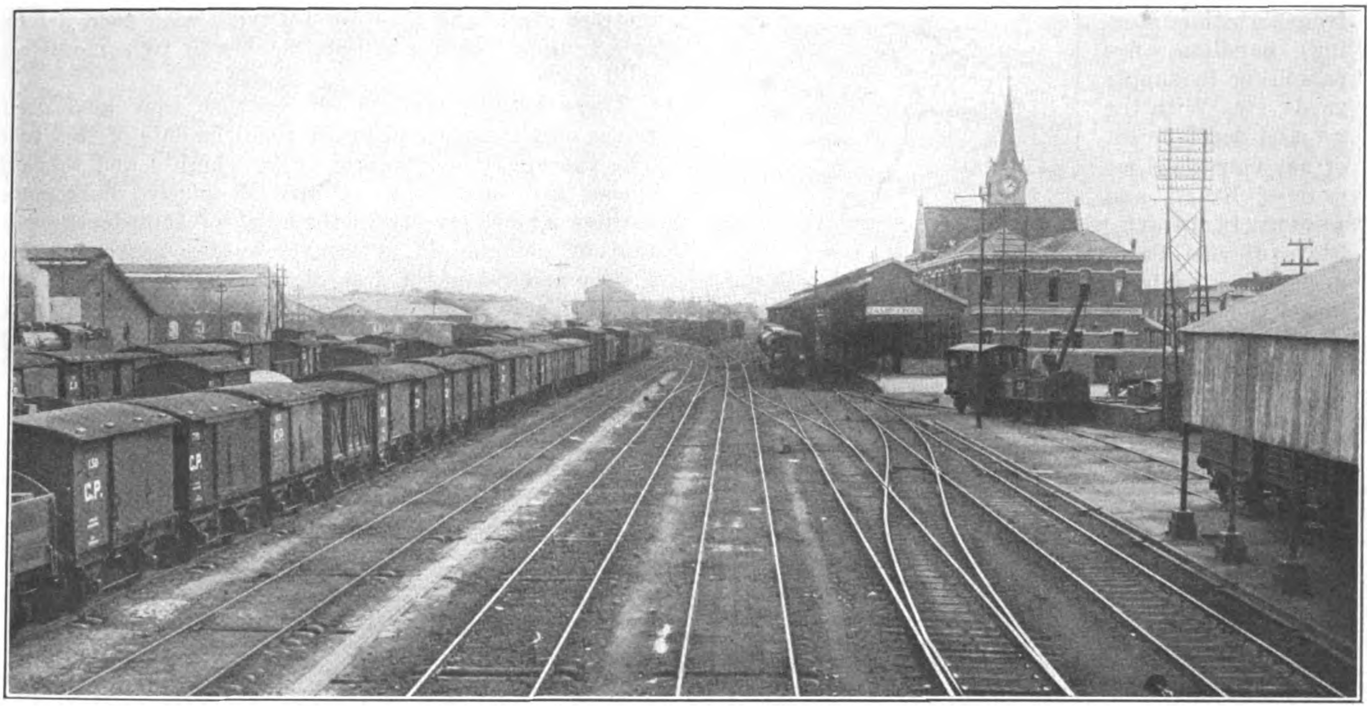
The Midi Railway is in the process of changing its electrified zones from single-phase to 1,500 volts direct current in order to conform to the adopted standard system for France. For use in this connection sixteen 1,200-kw., 1,500-volt mercury rectifiers have been ordered. These will be located in the existing transformer station buildings and will be operated in parallel with other substations containing synchronous converters.

The State Railways (formerly the Western Railway of France) employ some of the heaviest suburban equipment in Europe. One type of motor car, weighing 63 tons, has two-axle trucks and a double equipment of 225-hp. motors. Another type, weighing 72 tons, has a quadruple equipment of 165-hp. motors, two of the motors being mounted on each three-axle truck. This road also has ten 800-hp. gearless locomotives with an early form of quill drive.

As in England, there is a tendency to the use of the three-car unit (one motor car and two trailers) for suburban service. It is planned rapidly to extend the multiple-unit electric service around Paris, and a definite program of main line electrification also has been started.

3,000-Volt Electrification on Paulista

Initial Installation on One of Brazil's Crack Railroads Now Practically Complete—Details of Locomotives, Substation and Power Distribution System Are Given by Engineers of American Manufacturers Who Supplied Equipment—This Pioneer Undertaking Is Forerunner of an Extensive Application of Electric Motive Power in Brazil



STATION AND YARD AT CAMPINAS, THE NORTHERN END OF THE PRESENT ELECTRIFICATION

THE most notable electrification project on this continent during the past two years is that of an important section of the Paulista Railway in Brazil. Within a few weeks the new equipment will be in operation. While brief notes regarding the Paulista have appeared in the ELECTRIC RAILWAY JOURNAL from time to time, it is only now possible to present a comprehensive statement of the electrification. To this end the editors requested two engineers, of the General Electric Company and the Westinghouse Electric & Manufacturing Company respectively, men who are familiar with the details, to discuss the subject with respect to the work done by these two companies. The following two articles are the result. The General Electric Company is supplying eight freight and four passenger locomotives, the substation equipment and the line material and is doing all of the erection work. The Westinghouse company is furnishing two passenger and two freight locomotives. All of this, together with much general information regarding the railroad itself, is covered exhaustively in the articles. As Mr. Cooper's article includes an account of the conditions under which the Paulista Railway operates it is placed first.—EDITORS.

The Paulista Railway and the Westinghouse Locomotives

By S. B. Cooper

General Engineering Department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

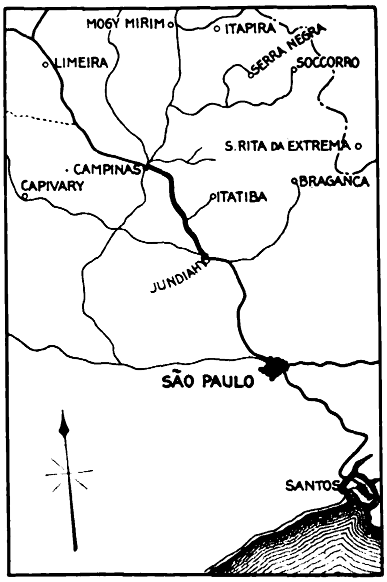
THE Companhia Paulista de Estradas de Ferro is about to begin electric operation over a 28-mile section of double track on its main line between Jundiahy and Campinas, Brazil. This marks the initial step in what is expected to become a broad program of electrification in Brazil, with the ultimate aim of substituting hydro-electric power for expensive coal.

Brazil's supply of native coal is not abundant; it is located in southern Brazil at some distance from the principal consuming centers and is of comparatively poor quality. It is high in sulphur and ash and, although some experiments have been made along the lines of preliminary treatment and pulverization, railroad men there are convinced that it cannot be considered a satisfactory fuel.

Some years ago, when the South American countries were essentially producers with a comparatively small consuming capacity, ships bound from the United States and Europe to South America for cargoes of cereals, meats, coffee, hides, etc., were able to carry coal at comparatively low rates on outbound voyages. Coal could be landed in Rio de Janeiro or Buenos Aires for $6 or $7 per ton. Since that time, however, the development of these countries has been phenomenal—their consuming capacity has increased with the development of their resources and industries, so that high-class outbound cargoes are available. The world-wide shortage of ships caused by the war has raised ocean freight rates enormously and these two factors, combined with the increased coal prices at the mines, have caused the price of coal to reach almost prohibitive figures.

WOOD BURNED EXTENSIVELY ON LOCOMOTIVES

During the war it was almost impossible to obtain coal at all, except in very limited quantities at exorbitant prices, so that many of the Brazilian railroads, the Paulista among them, fell back on wood as locomotive fuel. Brazil has, of course, a wonderful supply of hard woods that make excellent fuel, but even Brazil could not keep up with the demand for wood fuel for her railroads, at least from sources within commercially practicable distances of the lines. Furthermore, for a given calorific value wood fuel requires a comparatively large amount of labor in cutting, transportation, storing, handling, fire patrolling in supply yards, etc. With the rapid development of her marvelous resources, Brazil, and particularly the State of São Paulo needs labor badly. I heard the statement made in 1917 that there were 15,000 men in the State of São Paulo engaged in getting out wood for the railways.



ELECTRIFIED SECTION OF THE PAULISTA AND CONNECTIONS

The topographical and climatic conditions are such as to give abundant water power. A sharp mountain range, the Serra do Mar, rises practically at the seacoast, reaching a height of 2,000 to 2,500 ft. or more within a very short distance from the ocean. From this range the drainage is, in general, toward the northwest, with a gradual fall into the Paraná River, which thence flows south, emptying into the Atlantic Ocean through the Rio Plata at Buenos Aires. The State of São Paulo is semi-mountainous, with abundant rainfall, and is crossed by several fairly large rivers with frequent falls and without excessively low water periods.

What then could be more logical than the utilization of this abundant native power instead of inferior or expensive coal? The officials of the Paulista company have made careful studies, during the last four years, of the possibilities of electrification, and in the spring of 1920 placed their orders for the equipment necessary for the electrical operation of the 28 miles of double track between Jundiahy and Campinas.

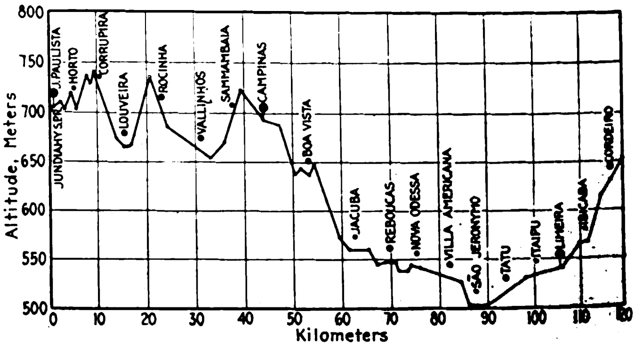
PRESENT ELECTRIFICATION IS BUT THE BEGINNING

Jundiahy is the southern terminus of the Paulista system, where it joins and exchanges traffic with the São Paulo Railway, the English owned line running to Santos. Campinas, one of the most important centers of this wonderfully rich state, is the terminus of the Mogyana Railways, an extensive meter-gage system, covering the northern portion of the state. The Mogyana traffic is transferred to Paulista broad-gage (1.6 meters, or about 5 ft. 3 in.) cars at Campinas, for movement over the Paulista and São Paulo Railway lines to Santos, so that the section now being electrified is the one of heaviest traffic on the Paulista system. It is planned to extend the electrification in the near future beyond Campinas, and it is probable that eventually the entire broad-gage main line will be electrically operated.

The Westinghouse Electric International Company is furnishing two freight and two passenger locomotives for this initial electrification. The freight locomotives are of the six-axle type, with two six-wheel articulated trucks. There are six axle-mounted motors rating 280 hp. at the one-hour rating. Each motor is wound for 1,500 volts for operation two in series on 3,000 volts and is arranged for field control. Each motor drives its axle by a single flexible gear. The passenger locomotives are of the 2-4-0+0-4-2 type, with each driving axle equipped with a 560-hp., 3,000-volt twin motor and quill drive.

These details were chosen because they lend themselves particularly well to the requirements of this road. The passenger and freight train weights and schedule speeds are such as to require locomotive horsepower ratings almost exactly in the ratio of four to three, so that by using eight armatures on the passenger locomotive and six on the freight locomotive it was possible to use identical motors in both services, except for the external frames. The passenger motors are in twin frames, while the freight motors are in axle and nose-suspension frames, but the motors are identical electrically, and all replacement parts, coils, complete armatures, field poles, brushes, armature bearings, etc., are interchangeable throughout. This operating advantage is obtained without the sacrifice of fitness of type of each engine for its service. The freight locomotives, operating at speeds up to 40 m.p.h. with comparatively light axle loads, have the mechanical simplicity inherent in axle-mounted motors and direct-geared drive, while the passenger locomotives for speeds up to 65 m.p.h. have the advantages of high center of gravity and large proportion of spring-borne weight given by the quill drive, so desirable in high-speed service.

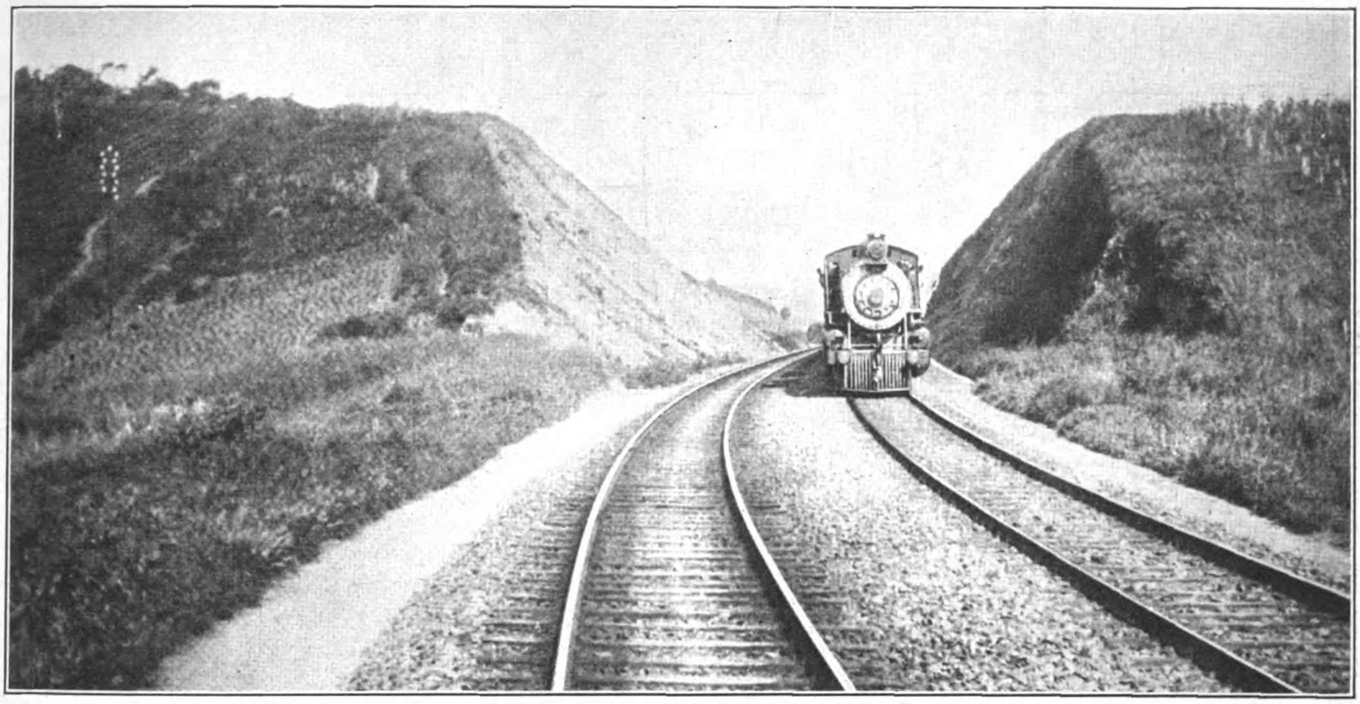
Mechanical practice on the Paulista, as on many South American railroads, follows European rather than American lines, and their standards of mechanical workmanship and maintenance are higher than those followed on North American roads. Every effort was made in the design of these locomotives to meet these high standards of mechanical practice. The frames are of solid slab steel with the openings drilled and burned out by torch. The brake rigging and equalizer parts are fitted with case-hardened pins and bushings throughout, thus minimizing wear and facilitating replacement. The pedestal shoes are of bronze and the journal boxes are arranged for grease lubrication of the hub liners.



PROFILE OF TRACK ON THE PAULISTA RAILWAY NORTH FROM JUNDIAHY

The control equipment has been worked out to give the greatest possible degree of simplicity consistent with operating flexibility, including the Westinghouse system of unit switches. All switches required to break heavy currents are of the unit type mounted in two rows just below the main grid resistors. Motor combination circuits for motoring and regenerating are set up by cam switch groups and stabilizing resistor connections for regeneration are made by smaller unit switches without blowout coils.

The Paulista uses the Continental type of coupler with take-up screws on the passenger cars, but only open links on the freight equipment. For this reason it is particularly desirable to have a high degree of flexibility and smoothness in the control. This is accomplished by having three motor combinations of six, three and two armatures in series on the freight locomotives, giving, with field control notches, six running speeds. The main handle on the master controller has eighteen positions, giving a total of fifty-four notches. On the passenger locomotives the armatures are connected eight, four and two in series, giving six running speeds and fifty-four notches.



A SAMPLE OF THE WELL-CONSTRUCTED TRACK THAT IS BEING ELECTRIFIED ON THE PAULISTA

Regeneration is provided for in all three combinations, with thirteen notches in each combination, giving a particularly wide range of regenerating speeds, a most desirable feature with the various classes of trains and varying grade conditions existing on the Paulista.

In the auxiliary equipment a single high-voltage auxiliary motor-generator set furnishes power for control, lights, motor excitation during regeneration, for blowers, compressor and vacuum exhauster. The motors driving the exhauster and blowers are practically identical. The control and auxiliary equipment throughout is the same on the freight and passenger locomotives, excepting for such detailed differences as are required for the control of six and eight armatures respectively. The brake equipment consists of a combination of air and vacuum brakes. The space requirements for the cylinders made it impossible to use vacuum brakes on the locomotives, so they are equipped with air brakes. The control of the brakes is so arranged that air on the locomotive and vacuum brakes on the train are handled from a single valve with uniform rates of application and release. An independent straight air valve is provided for the separate control of the locomotive brakes as desired, thus making it possible to shut down the exhauster during light engine or switching movements.

TABLE I—GENERAL DATA OF WESTINGHOUSE LOCOMOTIVES

	Freight	Passenger
Type of truck	0-6-0+0-6-0 Articulated	2-4-0+0-4-2 Articulated
Rigid wheelbase	14 ft. 0 in.	8 ft. 4 in.
Total wheelbase	37 ft. 0 in.	41 ft. 2 in.
Length over buffers	50 ft. 2 in.	52 ft. 11 in.
Total height over cab roof	12 ft. 7 in.	12 ft. 7 in.
Total height with pantograph down	14 ft. 10 in.	14 ft. 10 in.
Diameter of driving wheels	40 in.	63 in.
Total weight, short tons (2,000 lb.)	116.6	140.8
Weight on drivers, tons	116.6	101.8
Motors	6 — No. 350	4 — No. 351
Gear ratio	16:63	28:86
One-hour rating, per motor	280 hp.	560 hp.

The traffic on the Paulista system is growing at a very healthy rate and even with double track it will not be many years before track capacity becomes a serious consideration. It seems probable that by that time both the São Paulo and Paulista Railways will change over to M. C. B.-type couplers, enabling them to handle much larger trains. With this end in view, these locomotives have been equipped for multiple operation so that they can be double-headed with a single crew and handle 1,540-ton (2,000-lb.) instead of 770-ton trains. The bumper castings have been so designed that M. C. B. couplers can be readily applied.

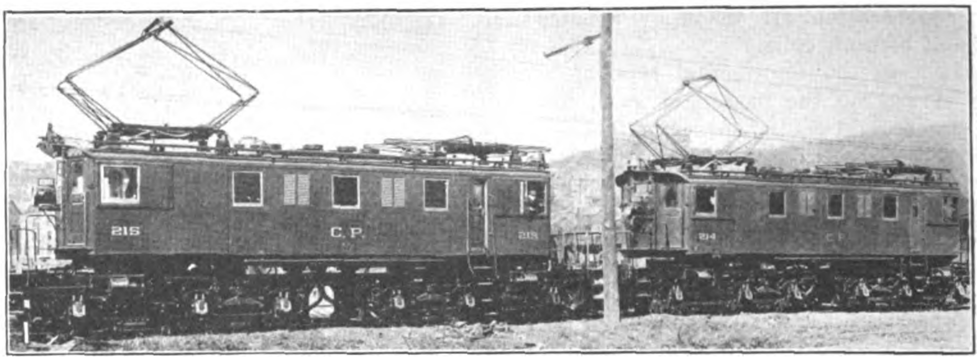
The more important ratings and dimensions of the two types of locomotive are shown in Tables I and II. Ratings are on the basis of the A. I. E. E. rules throughout, the continuous rating being based on 80-deg. C. rise by thermometer, or 105-deg. rise by resistance, thus giving conservative total temperatures with the high air temperatures encountered at certain seasons in Brazil.

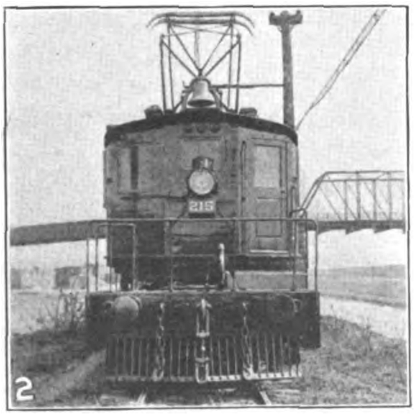
TABLE II—WESTINGHOUSE LOCOMOTIVE RATINGS—SHORT FIELD

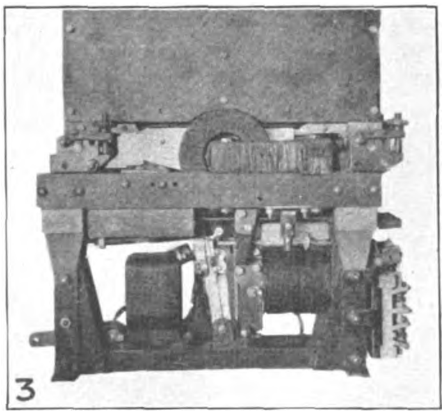
One-hour rating, horsepower	1,680	2,240
Tractive effort, pounds	29,400	19,400
Speed, miles per hour	21.4	43.2
Continuous rating, * horsepower	1,350	1,800
Tractive effort, pounds	21,600	14,300
Speed, miles per hour	23.4	47.2
Tractive effort at 25 per cent adhesion, pounds	58,500	51,000
Maximum safe speed, miles per hour	40	65

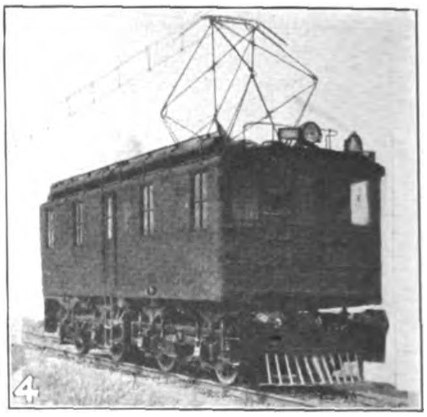
* A.I.E.E. Standardization Rules, 80-deg. C. rise by thermometer; 105-deg. C. rise by resistance.

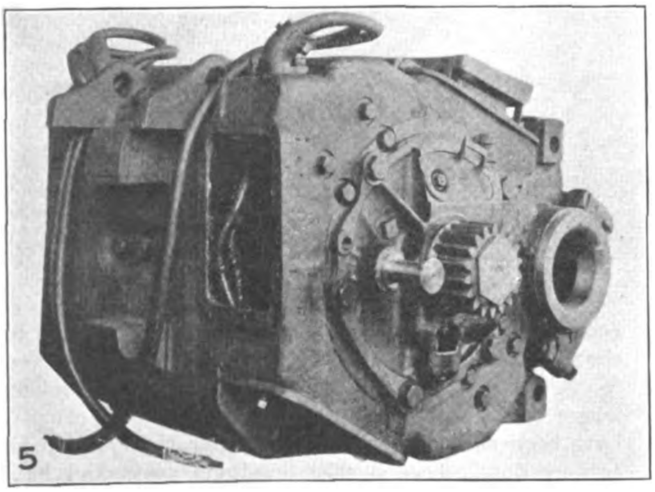
Paulista Electric Locomotives and Important Parts of Their Electrical Equipment

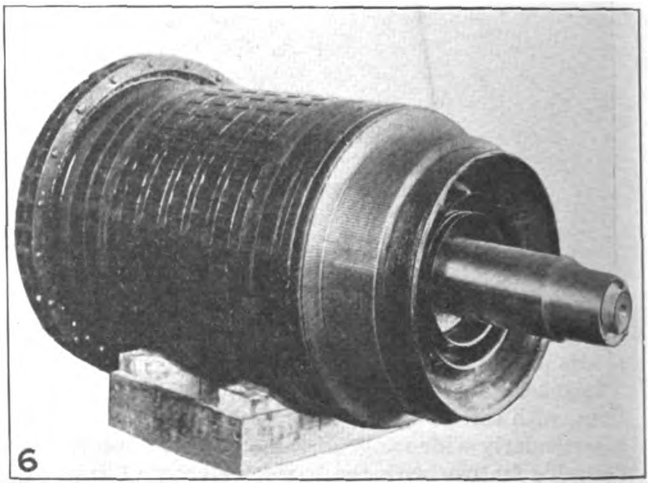


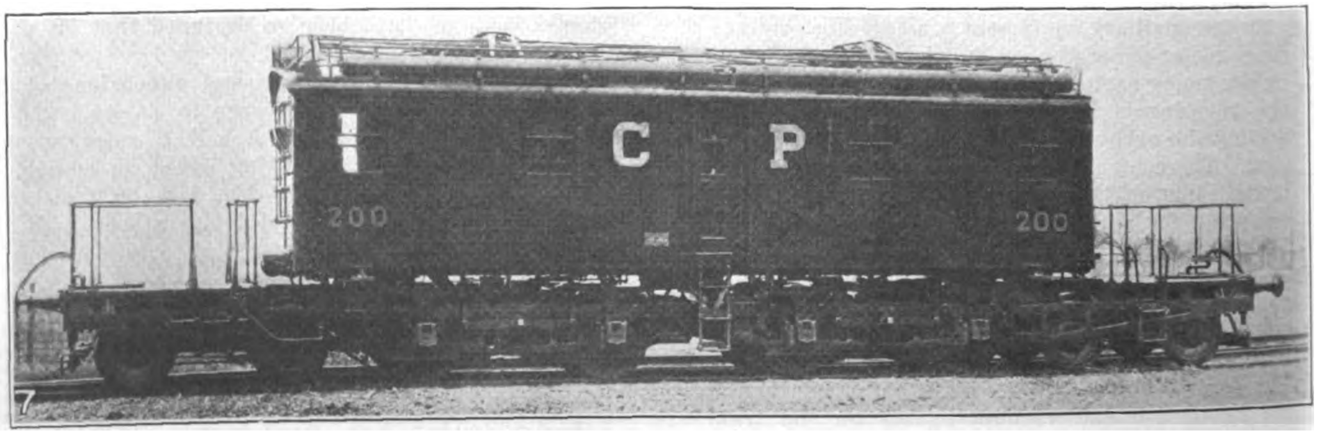






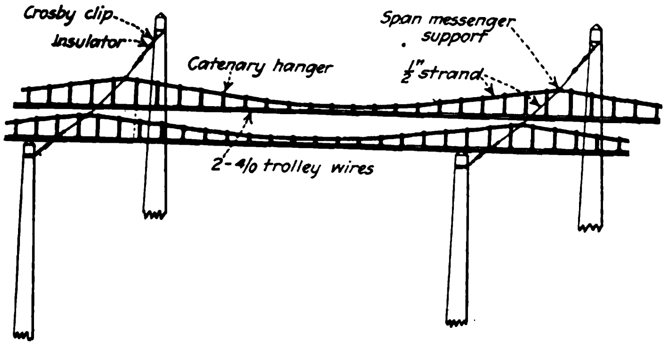






1—The Baldwin-Westinghouse freight locomotive.
2—End view of same locomotive, showing Continental coupler.
3—High-speed circuit-breaker used on the General Electric locomotives.
4—The General Electric freight locomotive.
5—Commutator end of G.E. motor, Type 267, Form A.
6—Armature for GE-267A motor.
7—The 120-ton General Electric passenger locomotive.

The shipment of these locomotives involves some interesting features. Each cab is completely housed in after being mounted on a heavily framed platform. The housing consists of a double lumber sheathing interlaid with heavy waterproof building paper. Each truck complete with its motors and gears mounted in place is similarly boxed and two additional boxes per locomotive carry the pantograph trolleys. The truck and pantograph boxes are loaded in the ship's hold and the two cabs are carried on deck, one on either side of the main hatch, securely bolted and lashed in place. After unloading and unboxing, it will only be necessary to set the cab on the trucks, mount the pantographs and connect up the motor leads and brake connections and the locomotive will be ready for service. By the time this article is printed the freight locomotives will probably have been landed in Brazil. The passenger locomotives are now approaching completion in the East Pittsburgh works of the company.



DIAGRAMMATIC SKETCH OF DOUBLE-TRACK, CROSS-SPAN CATENARY ON TANGENT

The General Electric's Contribution to the Paulista Electrification

By W. D. Bearce

Railway and Traction Engineering Department, General Electric Company, Schenectady, N. Y.

THE concluding shipments are being made on the $2,000,000 contract with the International General Electric Company in connection with the electrification of the Jundiahy-Campinas section of the Paulista Railway.

The motive power equipment being furnished by this company consists of eight freight locomotives weighing 100 tons (2,000 lb.) each and four passenger locomotives weighing 120 tons each. Work has been

São Paulo Railway and the Central Railway of Brazil. The Central Railway is government owned and electrification of this line has also been authorized. At Campinas and other points north connection is made by the Paulista Railway with a number of feeder lines, which bring large quantities of coffee and other raw material from the interior.

The road is rock ballasted and the construction throughout is equal to any of the main-line roads in the United States. The track gage is 5 ft. 3 in. on the section to be electrified, but some of the connecting lines are narrow-gage and facilities are provided for transferring the car bodies complete with merchandise to narrow-gage trucks and vice versa. The passenger service includes high-speed passenger trains with full Pullman accommodations. The present locomotive equipment consists of heavy-type locomotives for freight service with high-speed engines for passenger service. All are equipped for burning wood. The variety of wood most used is known as quebracho, which gives satisfactory results except that, of course, the quantity required for a 100-mile run is very bulky. Recently there has been difficulty in procuring even wood that is suitable for this work.

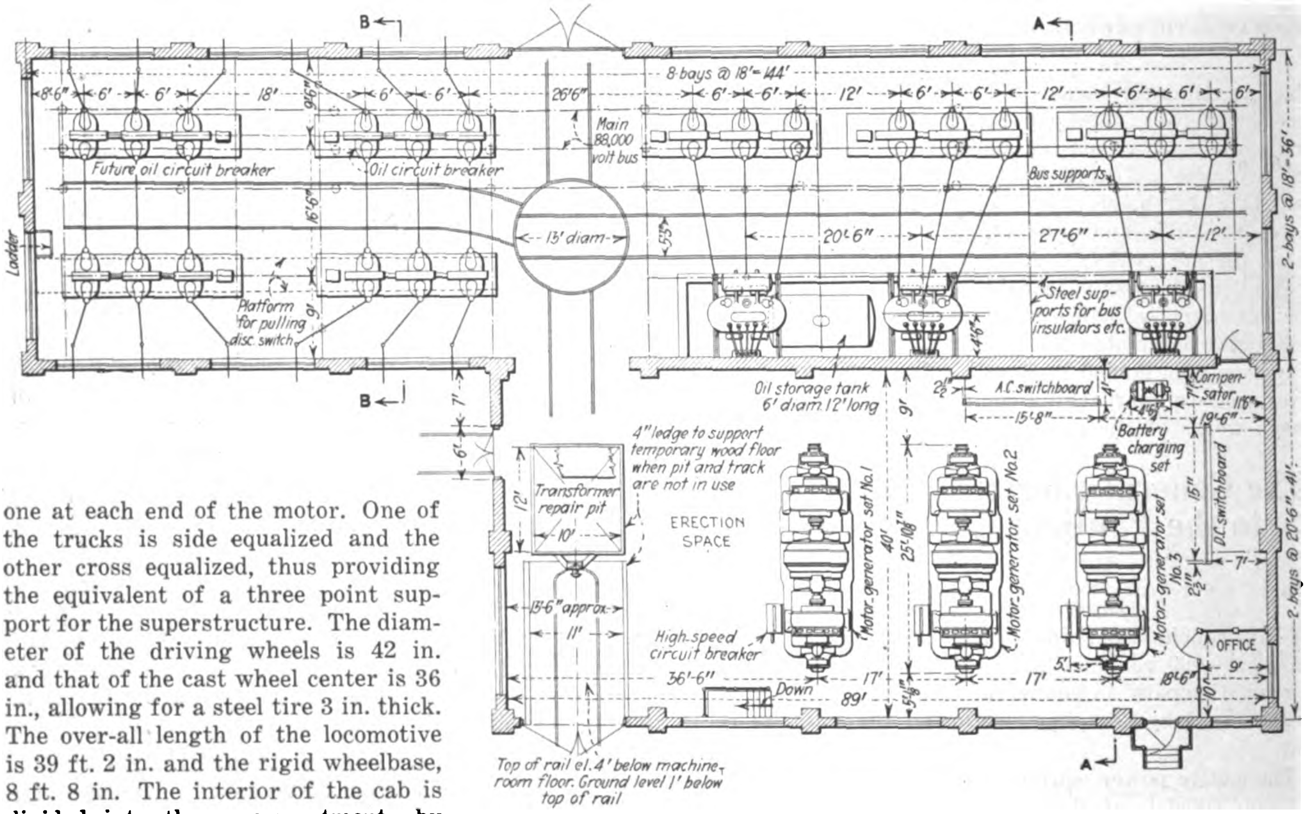
ENORMOUS TONNAGE HANDLED ON SECTION BEING ELECTRIFIED

The section selected for electrification presents a rather difficult profile, including maximum grades of 1.5 to 1.8 per cent. While the immediate plans of the Paulista company contemplate electrification for only a distance of 73 miles, the design and capacity of all apparatus and equipment are suitable for operating on an extension to São Carlos, a total distance of 128 miles. The approximate traffic handled over this line during the year 1918 from Jundiahy to Cordeiro was about 275,000,000 ton-miles, including freight, passenger and non-revenue service. The electrical equipment is designed for handling approximately double this amount, as is also the substation and line equipment. As a basis for estimates it was assumed that the number of trains per day over the initial electric zone will be six passenger and twenty-one freight in each direction, making a total of fifty-four trains per day.

LOCOMOTIVE DESIGN FOLLOWS UNITED STATES MODELS

The initial order for locomotives included eight freight and four passenger for handling a trailing train of 770 short tons on the maximum 1.8 per cent grade at speeds of from 12 to 16 m.p.h. The maximum allowable speed on tangent level track is 30 to 35 m.p.h. It is expected that because of the greater capacity and higher speed characteristics the electric locomotives will provide an appreciable improvement over the existing steam service, both as regards schedule speed and weight of trains handled.

The freight locomotive has a running gear consisting of two two-axle trucks coupled together by an articulated joint, and a single cab of the box type. The draft gear is mounted on the trucks, and all hauling and buffing stresses are transmitted through the truck frames and articulated joint, thus eliminating any possibility of damage to the cab and platform structure. Each truck is equipped with two GE-267 motors of the box-frame type, geared to the driving axle by two sets of gearing, one at each end of the motor. One of the trucks is side equalized and the other cross equalized, thus providing the equivalent of a three point support for the superstructure. The diameter of the driving wheels is 42 in. and that of the cast wheel center is 36 in., allowing for a steel tire 3 in. thick. The over-all length of the locomotive is 39 ft. 2 in. and the rigid wheelbase, 8 ft. 8 in. The interior of the cab is divided into three compartments by partitions or bulkheads so placed as to form two end compartments about 5 ft. in length for the operator's cabs and the remainder for housing the control equipment, compressor-exhauster set and other auxiliary apparatus. Two pantograph trolleys, of the double-pan sliding type similar to that used in other heavy electrification projects, are mounted on the cab roof. These are insulated for 3,000 volts and were designed to operate through a range of from 15 to 22 ft. above the rail.


B
A
8 bays @ 18'=144'
8'6"
6'
6'
18'
9'6"
26'6"
Main 88,000 volt bus
12'
Future oil circuit breaker
Oil circuit breaker
Bus supports
16'6"
13' diam.
5'5"
20'6"
27'6"
Ladder
Platform for pulling disc switch
Steel supports for bus insulators etc.
4'6"
2-bays @ 18'=36'
Oil storage tank 6' diam. 12' long
9'
A.C. switchboard
15'8"
Compensator
19'6"
Battery charging set
4" ledge to support temporary wood floor when pit and track are not in use
7'
6'
Transformer repair pit
10'
ERECTION SPACE
Motor-generator set No.1
Motor-generator set No.2
Motor-generator set No.3
40'
25'10⅛"
15"
D.C. switchboard
2-bays @ 20'6"=41'
13'6" approx.
11'
High-speed circuit breaker
36'-6"
Down
17'
89'
5'
18'6"
OFFICE
9'
Top of rail el. 4' below machine room floor. Ground level 1' below top of rail

PLAN OF THE LOUVEIRA SUBSTATION, CONTAINING THREE 1,500-KW. M. G. SETS

TWO TYPES OF BRAKE NECESSARY

To conform to the equipment on this road it was necessary to provide control for the vacuum type brakes used on the cars. Two entirely different systems of brakes are therefore provided for—a straight air brake system for the locomotive and vacuum-type brakes on the train. The two systems are manipulated like the usual all-compressed-air type, the locomotive brakes being applied automatically simultaneously with the train brakes under normal running. Brakes can be applied on the locomotive alone or on the train alone if desired. During regeneration, however, a magnet valve insures that straight air cannot be applied while power is being returned to the trolley. However, should an emergency application be made, regeneration is discontinued and the brakes are applied on the locomotive.

WIDE GAGE PERMITTED USE OF MOTORS OF SELF-VENTILATING TYPE

The motors are of the box-frame commutating-pole type designed for self-ventilation, made possible by the ample room due to the wide gage. To supply clean air for ventilation of the motors, a ventilating pipe is provided, reaching to the outside of the locomotive truck. The fan is of the multiple type made integral with the armature-head flange on the end opposite the commutator. Air is taken into the frame at the commutator end through a screened opening and divides into two streams, one passing over and around the armature and field coils, while the other is drawn through longitudinal ducts in the armature core. All of the air is expelled from the frame at the end opposite the commutator. These motors are designed for operation at 1,500 volts per commutator with two motors connected permanently in series for the 3,000-volt supply. The gears are of the forged steel type with a reduction of 82 to 18 or 4.56.

NON-AUTOMATIC SINGLE-UNIT CONTROL INSTALLED

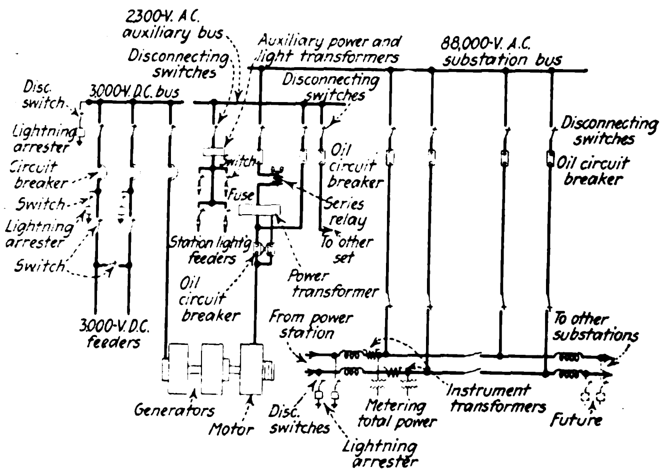
The control equipment is the type M, designed for non-automatic single-unit operation of the locomotives. All contactors, rheostats, transfer switches and the reverser are located in the central compartment of the cab. The master controllers, brake control, sander control, pantograph and other control devices are in the operator's cabs at the ends of the locomotive.

Energy for operation of the control is obtained from a 65-volt generator which is a part of the compressor exhauster unit. A 65-volt storage battery is connected in parallel with the generator to maintain constant voltage and to supply auxiliary lighting when the set is not running.

The motors may be operated all four in series through fourteen steps of resistance, and with two motors in series and two groups in parallel through ten steps of resistance. Regenerative braking is provided for returning energy to the line on descending grades. Ten steps are used for the regenerative braking control. The lighting and miscellaneous equipment includes the necessary lamps, switches, fuses and wiring for illuminating the cab and for headlights and accessories. The headlights are of the incandescent type with side number plates and are supplied from the 65-volt generator or battery. Speed recorders are included as a part of the locomotive equipment. The draft gear is attached to the end frames of the truck and is of the usual European type. The compressor-exhauster set is a combined unit having a compressor with a total piston displacement of 48 cu.ft. of air per minute at a pressure of 90 lb. per sq.in., an exhauster with a displacement of 150 cu.ft. of air per minute and a 65-volt direct-current generator above mentioned. The unit is driven by a 3,000-volt, direct-current motor, operating from the trolley.

PASSENGER LOCOMOTIVES HAVE GUIDING TRUCK AT EACH END

The passenger locomotives are similar in design to the freight units except that a two-axle guiding truck is provided at each end to comply with the railway company's specifications for high-speed service. The motors used are identical with those on the freight locomotive except for the change in gear ratio to provide for maximum speeds of from 56 to 62 m.p.h. The running gear consists of two two-axle driving trucks, the inner ends of which are connected by an articulated joint. The outer ends are extended and supported on the guiding trucks by roller centering devices over the front axle and an articulated joint over the rear axle which also connects the guiding and motor trucks. The general arrangement of motors and control is the same as that on the freight locomotives, and a similar system of regenerative braking is also provided. This locomotive is designed for hauling a train of 440 tons trailing up a 1 per cent grade at a speed of 38.8 m.p.h. The gear ratio on the passenger locomotive is 70:30 or 2.33.

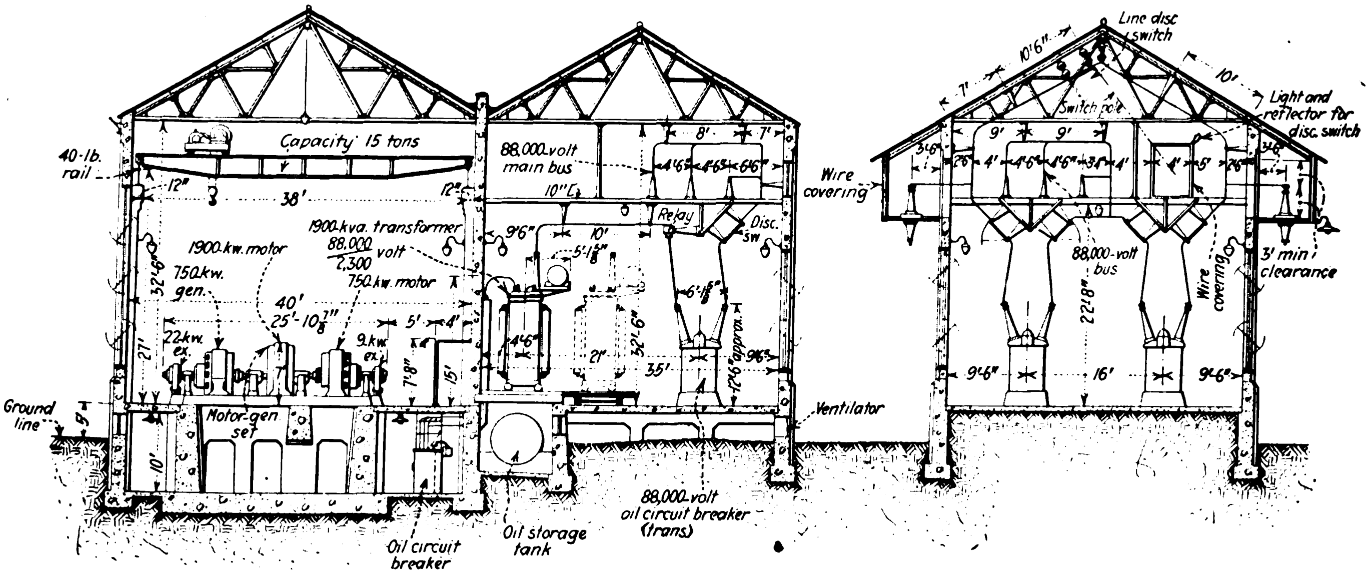

2300-V. A.C. auxiliary bus
Disconnecting switches
Auxiliary power and light transformers
88,000-V. A.C. substation bus
Disc. switch
3000-V. D.C. bus
Disconnecting switches
Lightning arrester
Circuit breaker
Switch
Lightning arrester
Switch
Switch
Fuse
Oil circuit breaker
Series relay
To other set
Station lightg. feeders
Oil circuit breaker
Power transformer
Disconnecting switches
Oil circuit breaker
3000-V. D.C. feeders
From power station
To other substations
Generators
Motor
Disc. switches
Metering total power
Instrument transformers
Future
Lightning arrester

SIMPLIFIED WIRING DIAGRAM, LOUVEIRA SUBSTATION

For speeds above the full series and full parallel connections a shunted field connection is provided by means of which the field current is reduced for maximum speed running.

Regenerative braking is accomplished by connecting one motor in such a way that it excites the field of three other motors and also its own field. This scheme is in general similar to that used on the Chicago, Milwaukee & St. Paul gearless passenger locomotives; it eliminates the necessity for a separate motor-generator set for excitation. A balancing resistance is connected in the circuit to protect the motors against sudden surges of the line voltage and to give effective protection against line voltage changes. In order to begin regeneration the main controller handle is turned to the first notch series position and the selective handle to the braking position. The main handle is then notched up until the desired braking effect is obtained.

A high-speed circuit breaker is placed between the 3,000-volt trolley and the locomotive apparatus. The duty of this breaker is to protect the motors and equipment from injury due to short circuits or overloads. In case of a short circuit this breaker cuts in a protective resistance and then opens the line contactor. The


Capacity 15 tons
40-lb. rail
12"
38'
12"
88,000-volt main bus
10" ⊏
8'
7'
1900-kva. transformer 88,000/2,300 volt
1900-kw. motor
750-kw. gen.
750-kw. motor
40'
25'-10⅞"
5'
4'
22-kw. ex.
9-kw. ex.
32'-6"
27'
7'-8"
15'
Relay
Disc. sw
9'6"
10'
5'-1⅝"
6'-1⅝"
4'6"
21'
32'-6"
35'
12'-6" approx.
Ground line
Motor-gen set
10'
Oil circuit breaker
Oil storage tank
88,000-volt oil circuit breaker (trans)
Ventilator
Wire covering
Line disc switch
10'6"
7'
10'
Switch pole
Light and reflector for disc. switch
9'
9'
88,000-volt bus
22'8"
Wire covering
3' min clearance
9'-6"
16'
9'-6"

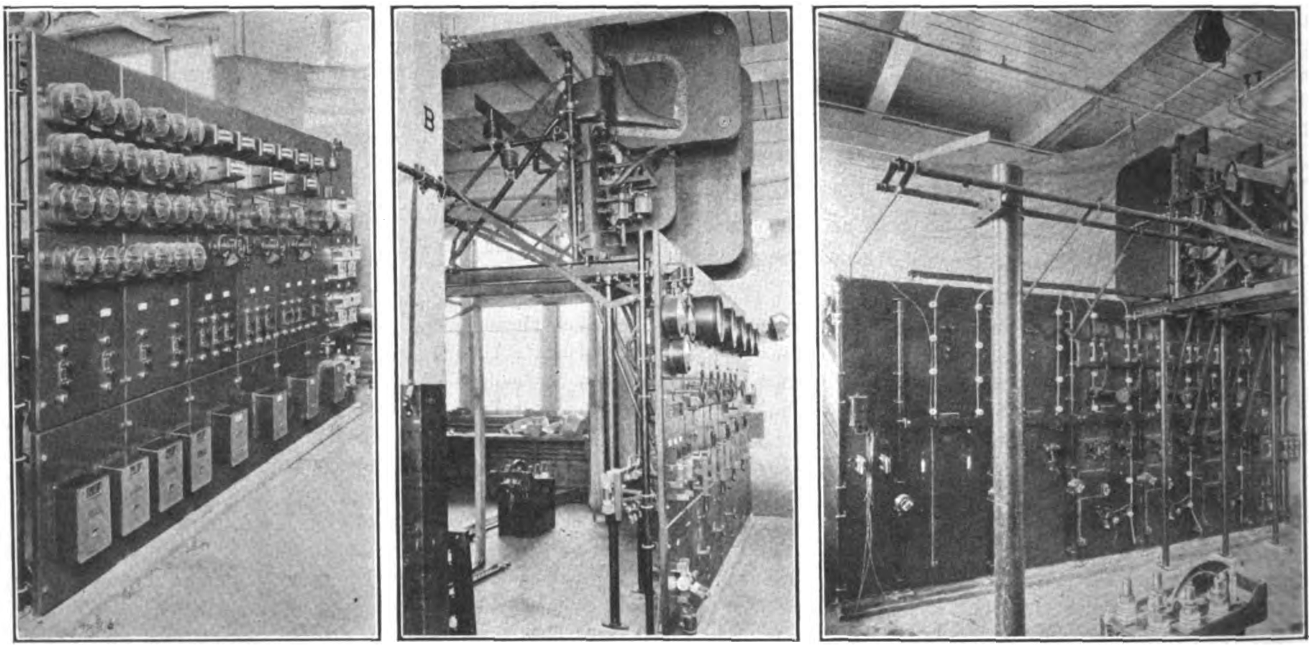
VERTICAL SECTIONS OF SUBSTATION (SEE A-A AND B-B IN PLAN) action is very rapid so that in case of heavy overload, or short circuit, the possibility of damage is reduced to a minimum. Breakers of a similar type are in operation in many parts of the United States both on locomotives and in substations.

Table III gives the dimensions, capacity and weights of the two locomotives.

SUBSTATION INSTALLED AT LOUVEIRA

For the initial electric zone between Jundiahy and Campinas one substation is being installed located at Louveira, a distance of 9.5 miles from Jundiahy. This station contains three 1,500-kw., three-unit synchronous motor-generator sets, each arranged to operate its two generators in series for 3,000 volts. Power is received from an 88,000-volt, 60-cycle transmission line and stepped down through three three-phase, 1,900-kva. transformers to 2,300 volts for the synchronous motor.

The three-phase oil-insulated and oil-cooled transformers are rated at 1,900 kw. and are inclosed in tanks of steel plate with all joints welded. Four separable steel radiators are mounted on the outside of the tank to provide sufficient radiating surface.


SWITCHBOARD VIEWS, LOUVEIRA SUBSTATION

At left, 90-in. feeder and synchronous motor switchboard. In center, 3,000-generator and railway feeder switchboard. At right, back of the generator and feeder board shown from another angle in the center illustration.

Each transformer is provided with an oil conservator or auxiliary tank mounted on the cover. This device permits the main tank to be completely filled with oil and differences in volume of oil due to temperature changes take place entirely within the conservator. This prevents the condensation of moisture within the transformer. Such condensation as may occur in the conservator is collected in a sump, is indicated on a gage glass and may readily be drawn off through a pet-cock.

Since there is no air in the main tank above the oil there is no possibility of explosion due to ignition of gases formed from hot oil. The guaranteed efficiency of these units at normal load is 98.3 per cent.

Four 2½ per cent taps are provided in the low-voltage winding to compensate for variation in the transmission line voltage and 50 per cent starting taps are also provided for starting the motor-generator sets.

The motor-generator sets are substantially similar to those furnished for heavy electric railroad work in the United States. The generators are designed for 1,500 volts per commutator and are permanently connected in series for 3,000-volt operation. They are separately excited from a 125-volt, direct-current exciter mounted at one end of the set. The series field is designed to provide flat compounding from no load to 150 per cent load. They are equipped with commutating poles and compensated pole-face windings to insure sparkless commutation at all loads. A load of three times normal rating can be carried for five minutes without injury, and under tests made before shipment loads of from five to six times normal were carried without sparking.

All of the fields of both generators are connected to the "low" side to reduce the possibility of injury from high voltage. A simple form of flash barrier is provided for the commutators similar to that supplied on other high-voltage, direct-current machines.

The synchronous motor is excited from a second 125-volt exciter direct-connected to the opposite end of the set. This exciter carries a compound winding excited from the main 3,000-volt conductor so that the motor

TABLE III—DATA ON GENERAL ELECTRIC LOCOMOTIVES FOR PAULISTA RAILWAY

	Freight	Passenger
Length over all	39 ft. 2 in.	55 ft.
Width	10 ft. 1¾ in.	10 ft. 1¾ in.
Height over trolley down	14 ft. 3 in.	14 ft. 3 in.
Total wheelbase	26 ft. 8 in.	46 ft. 0
Rigid wheelbase	8 ft. 8 in.	7 ft. 9 in.
Total weight, pounds	200,000	240,000
Weight on drivers, pounds	200,000	160,000
Weight per driving axle, pounds	50,000	40,000
Weight per guiding axle, pounds	None	20,000
Weight of mechanical equipment, pounds	115,400	155,400
Weight of electrical equipment, pounds	84,600	84,600
Diameter of drivers	42 in.	42 in.
Diameter of guiding wheel	.....	36 in.
Number of motors	4	4
Gear ratio	82:18	70:30
Total continuous rating, horsepower	1,600	1,600
Total (one-hour rating) horsepower	1,680	1,680
Tractive effort, continuous, pounds	28,820	14,720
Tractive effort, one hour, pounds	30,600	15,680
Speed, continuous rating, miles per hour	21 (34. km.)	41.25 (66.4 km.
Speed, one-hour rating, miles per hour	20.8 (33.5 km.)	40.5 (65 km.)
Maximum safe speed, miles per hour	28	53
Tractive effort, 30 per cent adhesion, pounds	60,000	48,000

field excitation varies in proportion to the load on the set. This provides for the proper excitation to give correct power factor with varying loads and also insures stable operation under heavy overloads. The equipment is designed for inverted operation to take care of reverse power in cases of regeneration.

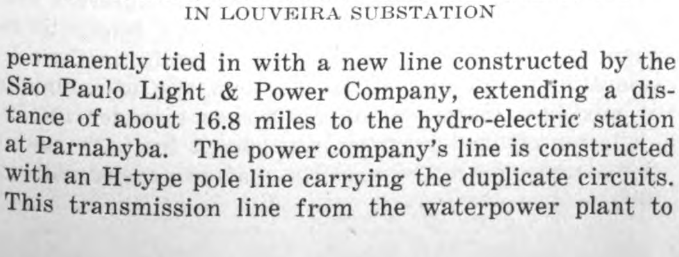
The switchboard is similar in design to other 3,000-volt, direct-current equipment. The 3,000-volt panels are installed together with the auxiliary station lighting panel. The high-voltage panels include one for each of the motor-generator sets and one for each outgoing feeder. The main circuit breakers are located above and to the rear of the switchboard panels so as to be well out of reach to prevent accidental contact. They are remote-controlled from operating levers located on the front of the panels. A 3,000-volt line switch is also included with each circuit breaker. These switches are remote-controlled from the front of the panel, as a safety measure. The switch handles for the circuit breakers are inverted to distinguish them from the line switches. The alternating-current switchboard is electrically controlled throughout. For lightning protection, a 96,000-volt aluminum-cell arrester is installed in the high-tension room of the station.

As a protection from short circuits and excessive overloads a high-speed circuit breaker is furnished with each motor-generator set. This is connected to the negative terminal of the machine and arranged to connect a limiting resistance into the circuit upon opening. At the same time the station circuit breakers are opened, completely cutting off the power supply. The speed of these circuit breakers is such that resistance is inserted in the circuit before the short circuit current reaches sufficient value to injure the apparatus.

Other auxiliary equipment supplied to the station includes a 15-ton hand-operated crane, a portable oil filter press and oil testing equipment, and a stationary compressor set. For control current a 4¾-kw. battery-charging motor-generator set is used with a 170-volt storage battery.

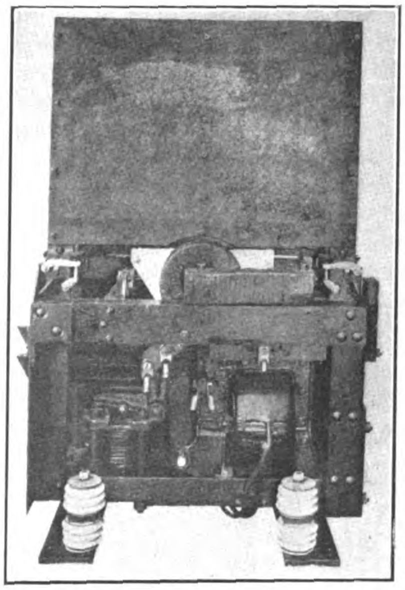
HIGH-TENSION CONNECTION WITH POWER COMPANY'S LINE

The railway company's high-tension transmission line has been constructed with duplicate circuits mounted on separate wood poles between Jundiahy and Louveira, a total distance of 10 miles. At Jundiahy this line is permanently tied in with a new line constructed by the São Paulo Light & Power Company, extending a distance of about 16.8 miles to the hydro-electric station at Parnahyba. The power company's line is constructed with an H-type pole line carrying the duplicate circuits. This transmission line from the waterpower plant to **the substation will thus be operated over a distance of 26.7 miles as a single system at 88,000 volts, three-phase, 60 cycles. The line is designed ultimately to supply three substations and the conductors are of No. 0 B. & S. stranded copper which will insure a very low line loss under ordinary operating conditions. On the railway company's lines two crossarms are used, with large pin-type insulators. A ground wire is also carried on each transmission line for lightning protection.**



THREE-UNIT, FOUR-BEARING, 1,500-KW. M. G. SET IN LOUVEIRA SUBSTATION

The overhead line construction is of the same general design as that used on the Chicago, Milwaukee & St. Paul. This is known as the twin-catenary construction, with two No. 0000 contact wires supported from the same steel messenger by loop hangers. Wood poles suitably guyed support the catenary. Hangers for the two contact wires are attached at alternate points to give a flexible construction and to insure the elimination of all "hard spots." Bracket supports are used on single-track and cross spans on multiple-track construction. The normal height of the contact wire is 21 ft. above the rail. For all sidings and yard tracks a single wire is used over each track. The General Electric Company furnished hangers, pull-offs, copper and steel wire, miscellaneous hardware, etc., for 76 miles of track.



HIGH-SPEED SUBSTATION CIRCUIT BREAKER

The twin-catenary construction is particularly successful on lines operating heavy trains requiring the collection of large amounts of current through pantograph trolleys. In addition to the advantage of the two contact wires for handling the current required, this construction also insures practically sparkless collection at the point of contact, both for heavy freight and high speed passenger operation.

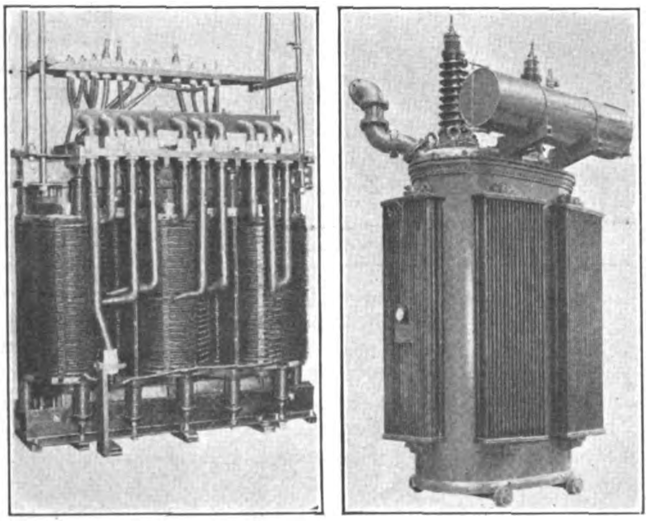
The rails on this line weigh 91 lb. per yard. They are bonded with pin-terminal-type bonds, 42 in. in length and of 211,600 circ.mil cross section. Cross bonds are also used for interconnecting the rails of the same track and for bonding between tracks on the multiple-track section.

TESTING AND SHIPPING THE LOCOMOTIVES

In the preparation of the locomotives for testing and for export shipment there were a number of unusual features. As the gage of track on the Paulista Railway is 5 ft. 3 in., special arrangements were necessary to provide for removing the locomotives from the shop to the test track and other arrangements were necessary to provide the necessary test track. For this purpose about 1 mile of extra rail was laid on the East Erie Commercial Railroad with 5 ft. 3 in. gage. In order to transport the locomotives from the shops to the test track, a distance of about ¾ mile, special transfer trucks were used, one for each truck of the locomotive. By means of these trucks, which operate on their own wheels of standard gage, the locomotives were moved out over the usual transfer table and standard-gage track to the special-gage section provided for testing. Upon reaching this section they were moved off the transfer trucks over a ramp, the end of which was elevated to the same height as the special trucks.

A complete set of tests is made on all locomotives, including regenerative braking and high-speed running. After test the locomotives are transferred to the shipping department, where they are dismantled and prepared for export shipment. The cab complete is removed from the truck and the pantograph, bells, etc., removed from the cab roof. Each truck is shipped separately without removing the motors from the truck frame. In the case of the passenger locomotive, each bogie truck is shipped with the adjacent motor truck without dismantling. As large vessels were available for making this shipment it was not necessary to reduce the locomotive to small packages.

As to progress on the construction of these locomotives, the first freight machine was ready for test on March 15. During May three freight and one passenger locomotives were shipped and progress on the balance of the order indicated that similar shipments will be made the following two months in accordance with the terms of the contract.



AT LEFT, THREE-PHASE TRANSFORMER FOR LOUVEIRA SUBSTATION, HIGH-TENSION SIDE

At right, case for a single-phase transformer, showing type to be used at Louveira. (Exterior view of actual case not available at this time.)

Responsibility for Accident Fixed

THE Interstate Commerce Commission in fixing the responsibility for head-on collision between a passenger train and an extra freight train of the Northern Ohio Traction & Light Company near Ravenna, Ohio, on Dec. 8, 1920, resulting in the death of four people and injury to seventeen, finds the conductor and motorman of the extra train to blame. The conductor of the extra train, which was being operated ahead of the regular train, proceeded from a siding at the sound of a whistle from the regular train intended as a signal to move ahead so there would be room for it to clear the switch. The extra train proceeded on this signal, the conductor assuming that the following train had orders to meet the opposing train at the next station.

Recommends Electrification Commission

Frank J. Sprague Points Out the Advantages of Such a Body at the Meeting of the Chicago Traffic Club on June 2—He Includes Representation of the Interstate Commerce Commission in Its Personnel

ACCORDING to Frank J. Sprague the time is ripe for the formation of a national engineering commission to consider electrification problems, the commission to be selected by the American Railway Association and to include representatives of the Interstate Commerce Commission, the National Electric Light Association and the water power, telephone and telegraph interests, in full touch with manufacturing developments. This suggestion was made by Mr. Sprague in the course of an address by him before the Traffic Club of Chicago on June 2, in which he considered also the development of the electric railway.

In Mr. Sprague's opinion the demand for electrification will come not because of superior fuel economy or savings in operating expenses possessed by the electric locomotive but because of the need for increasing the capacity of the railway by "that increase of speed which can only be obtained when unlimited power is at the command of operative officials and a type of equipment is used which will permit radical changes in methods of train handling, both on the road and at terminals." Mr. Sprague recognizes that electrification must come progressively, but he believes that the financial problems concerned with main-line electrification would be ameliorated if the railroads recognized that their primary province is the transportation and distribution of passengers and freight and that their power requirements should be supplied from central generating stations.

He then points out that the railway power demands in the city of Chicago, for instance, could be met by the Commonwealth Company by the addition of only a fraction of its present capacity and that this could be added in less time than the railroads could possibly be electrically equipped. He also expressed the belief that electrification in Chicago should be determined not according to the needs of a single railroad, but by that of all the railroads centering in the district, in co-operation with the local authorities, keeping in view the ultimate best interests of the railroads and of the community.

In answer to any criticism of his suggestion that the proposed national engineering association should include in its membership representatives of the Interstate Commerce Commission, Mr. Sprague called attention to the fact that the equipment and operation of trunk-line railways, in fact of all railways crossing state bounds, is a matter of national concern and under the jurisdiction of the Interstate Commerce Commission. Moreover, it alone today has the right to demand intimate comparative statistics and data covering the equipment and operation of railroads by different systems and its power and authority are likely to be augmented rather than restricted. Finally, in the consideration of another railway problem, that of automatic or auxiliary train control, the power to order the installation of such a system was placed in the hands of the commission in the recently enacted general railway bill.

N.E.L.A. Meeting Well Attended

At Its Annual Convention, Held at Chicago May 31 to June 3, National Electric Light Association Considered Railroad Electrification, Power Generation and Distribution, and Other Technical Subjects, but Laid Special Stress on Public Relations, Finance and Operation in Their Broad Aspects

THE convention of the National Electric Light Association, held in Chicago last week, occupied itself largely with finance and public relations. Executives, engineers, bankers and heads of the manufacturing and jobbing concerns were in attendance. The questions of regulation were discussed from all angles by managers of utilities and by public service commissioners. Public relations, to the betterment of which the association has devoted so much time and publicity during the past few months, received earnest consideration. From without the industry, manufacturers, bankers, publicists and government officials contributed their impressions of how utilities may best win public recognition and support, while from within the testimony of executives and others showed that the electric public utilities of the country are doing their part through excellent service at fair rates and through various channels of public information to carry the message of the utilities to the man in the street.

Samuel Insull, speaking on future expansion in the use of central-station power, touched on some of the vital issues of the day and gave wholesome advice on superpower systems. It is fair to say that no session of the very many held during the week was without its important feature. In fact, the program was so crammed with excellent reports, papers and addresses that their immediate absorption and appreciation was out of the question during the sessions of the convention.

A masterful analysis of the fundamental economics affecting electric light and power company service, in which the attention of the industry was focused on the points of primary interest, was made by Martin J. Insull in his presidential address. Mr. Insull stated that the industry is in a strong position but in need of tremendous sums of money to take care of the program of expansion demanded by the public. Money, he believed, must be obtained from the public, which fact necessitates careful attention to good public relations. Finally, he saw the cessation of municipal regulation and operation in favor of state regulation. The small-town plant is going; the big system feeding the small towns from a transmission line is taking its place.

In general, said Mr. Insull, the electric light and power business continues its growth. It is estimated that there is necessary and will be installed 1,000,000 kw. of generating capacity during this calendar year. The industry may, therefore, look forward to a promising future. It is estimated that for the next five years the electric light and power industry, in order to provide for the demands that will be made upon it by the public, will require approximately $1,000,000,000 per year.

At the second general and executive session, in reporting for the Superpower Survey, M. S. Sloan said that the government had appropriated $100,000 for the study and that a number of utilities and manufacturing companies had contributed $50,000 more to complete the work. The chief difficulties were legal and financial rather than engineering. It was the purpose, he said, to seek a federal charter because of limitations imposed by state laws and the charters of the large public utilities involved. The committee was unanimous in its opinion that the superpower system should be controlled by the existing public utilities and financed by private capital.

R. H. Ballard of Los Angeles, in reporting for the public policy sub-committee on inductive interference, told of the meetings held between executives of the National Electric Light Association and the American Telephone & Telegraph Company for the purpose of correlating their activities and jointly working out solutions to inductive-interference problems. While the engineers will continue their work, it was agreed that no precedents would be invoked in establishing the rights of either the telephone or electric light companies, but that both interests would seek the best economic solution of the problem.

The report of the underground systems committee was of special importance because of manufacturers in the country now being able to construct cables capable of withstanding voltages up to 33,000. Discussing higher voltages for underground cables, Mr. Roper said that the Commonwealth Edison Company is planning to distribute 33,000 volts over cables which during the last two years have been installed for 22,000 volts. No trouble is expected with the higher voltage. The report of the committee on prime movers was a complete one. It will be abstracted in a later issue of this paper. That of the committee on railroad electrification is abstracted below.

Electrification of Steam Railroads

THE committee on steam railroad electrification presented a general study of the subject with a view to showing the members of the association how and why the railroads will furnish an increasing market for electric power. The committee comprised L. A. Ferguson, vice-president Commonwealth Edison Company, Chicago, Ill., chairman; A. H. Armstrong, General Electric Company; W. C. L. Eglin, Philadelphia Electric Company, and F. H. Shepard, Westinghouse Electric & Manufacturing Company. The following abstracts from the report will indicate its general form and spirit:

The steam locomotive has been developed to a point where it meets the conditions imposed upon it by the transportation problems of freight and passenger services, satisfactorily in most cases and in all cases where the traffic is light. As the traffic has increased on roads on which there are heavy grades, additional capacity has had to be provided by laying additional tracks. It is not the intention of the committee at this time to advocate the abandonment of either the freight or the passenger steam locomotive in places where it can be used to economical advantage.

The steam locomotive suffers from the disadvantage that the steam generator must be carried with it, and it must be capable of withstanding shocks and vibrations, thus limiting the design of the fire-box to a metal fire-box of relatively small size and materially reducing the efficient burning of the coal. The standby losses of the locomotive must be high and these losses increase in the larger units, as the coal must be consumed whether the engine is running or not, as long as the locomotive is in service.

REAL ESTATE CONSIDERATIONS IN ELECTRIFICATION

The economical advantages of moving freight in bulk, requiring the use of heavy trains, are causing increase in the size of the yards and the terminal facilities so as properly to assemble these trains. With the growing value of real estate in the large communities, the cost of these terminals now forms an important part of the total railroad investment, and with the development of the city with buildings surrounding the existing yards it is becoming very difficult to enlarge these facilities to meet the growing requirements. Thus means must be provided to increase the capacity of yards and terminals. It seems logical and rational that both the railroad tracks and especially the yards and terminals must be operated at a number of levels to increase their capacity in the existing areas. This must be accomplished by the elimination of the steam boiler from the locomotive.

For two essential reasons—the ability must be had to increase the locomotive capacity to any desired limit for haulage purposes on the existing main tracks and it must be possible to permit the tracks to be placed on various levels—some method of delivering power to the locomotive other than in the form of coal in the present locomotive tender must be employed.

WHERE THE ELECTRIC LOCOMOTIVE FITS IN

The application of electricity to the railroads will naturally follow the line of its application to the industries. It will permit a better accomplishment of the functions of the railroad by increasing the speed of trains and reduction in the investment cost of terminals or the increase in their capacity. Its application must come where the greatest advantages of its use will be shown. Probably the most notable examples will be in the operation of trains through long tunnels, where the ventilation problem makes it more mandatory; in meeting the increasing requirements of terminal and yard facilities; in maintaining the highest speeds on the roads with heavy grades, and in its use on sections in which increased speed of general or special movements is necessary to handle existing or growing passenger or freight traffic.

The committee believes that the extension of the use of electricity for motive power must come through its economic advantages and its ability to assist the railroad organization in meeting the growing requirements of traffic and reducing the cost of operation and maintenance.

VARIETY IN TYPE OF MOTIVE POWER WILL CONTINUE

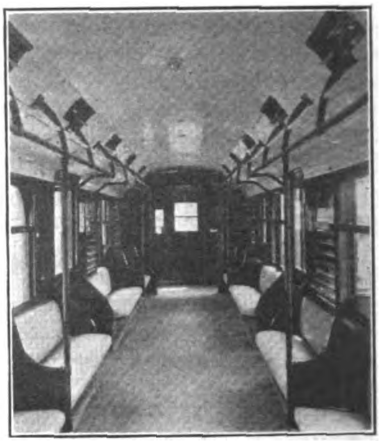
There are now available methods and apparatus such that electrical energy may be supplied to the train to meet the requirements of speed, load and grade. The selection of the type of apparatus will vary with the requirements of the railroads, and it is probable that there will be as many different sizes, types and designs of electric locomotives as there are at present of steam locomotives.

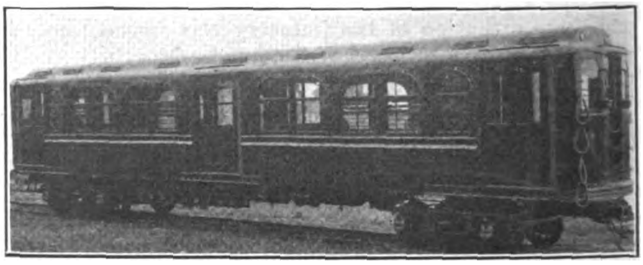
The power companies of the United States should be ready to furnish electrical energy to take the place of the coal which is now delivered to the railroads at the mines, enabling the railroads to obtain promptly and in any quantity the required electrical energy produced by the large generating stations of the power companies, and that at a rate which would compare favorably with the cost of its production in power houses built for the railroad load alone.

New Tube Cars

Hudson & Manhattan Railroad Lengthens Doors on Latest Twenty-five Cars and Makes a Few Changes in Interior Equipment of Car

THE Hudson & Manhattan Railroad has recently purchased twenty-five additional steel cars to accommodate the traffic of the road. The construction of these cars follows very closely that of the cars previously used by the company, but they have wider side doors and are 3 ft. longer over all than the older cars. The use of the wider center doors does not change the seating capacity, but adds greatly to the convenience of passengers in entering and leaving the cars. Another point of difference is that while the system of vertical posts and horizontal rods for passenger support in the car is retained the posts directly on each side of the side doors have been omitted. This change is shown in the view of the car interior. The purpose of this change is to prevent passengers from blocking the side entrance by holding on to one of these posts.





THESE NEW HUDSON & MANHATTAN CARS EMBODY SEVERAL CHANGES FROM THE FORMER TYPE

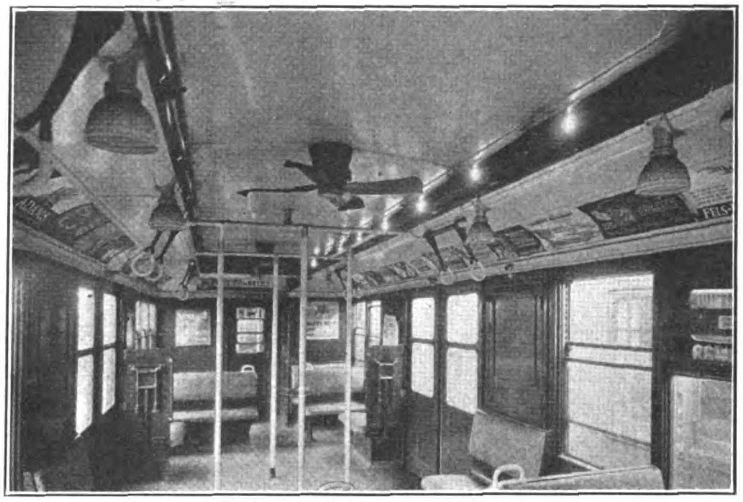
The new cars are equipped with ceiling fans. Similar fans are also to be applied in the older cars to provide for a brisk circulation of air even when the cars are standing at stations. The fans do not show in the interior view of the car as they had not yet been installed when the picture was taken.

The cars are equipped with GE-259-A motors, G. E. P. C. control and Westinghouse A. M. L. E. air brake equipments, all adapted to function with the older equipment, which has been fully described in the ELECTRIC RAILWAY JOURNAL.

New York Municipal Car Improvements

Since the Introduction of the Large Multi-Side-Door Cars on the Lines of the New York Municipal Railway Various Additions and Refinements Have Been Made to Provide Increased Comfort and Safety for Passengers

WHEN the Brooklyn Rapid Transit System offered to operate a part of the vast subway and elevated network as suggested by the city of New York in 1911 the design of a car most desirable was one of the vast problems presented to the engineers of this company for solution. When the various details of design were finally settled the most noteworthy characteristics of this car in which it differed from other designs were its large size, its unique seating arrangement and its multi-side-door construction. The value of these new features embodied in the design has now been demonstrated by more than five years of service under the most severe traffic conditions that can be found in any city. At present 900 of these cars are in service or on order and in the fundamental considerations the last cars, namely, the 2,800 series, are identical with the first ordered. Quite a number of refinements and improvements have been added, but the changes which were made in construction were very few.


LOW MONITOR TYPE ROOF CONSTRUCTION WITH DECK-SASH VENTILATORS, VENTILATING FANS AND REARRANGED LIGHTING

The essential characteristics of the design, construction and equipment of these cars were very completely covered in a series of articles published in the issues of the ELECTRIC RAILWAY JOURNAL for June 6, 1914; June 13, 1914; Dec. 26, 1914; March 13, 1915; March 27, 1915, and May 8, 1915. The purpose of the present article is to describe some of the improvements and changes incorporated in the last 100 cars ordered and include additions made since this series of articles was published.

MONITOR TYPE ROOF FOR VENTILATION

The form of roof used with the 2,800s is of a low monitor type with twenty deck-sash ventilators on each side of the car. This construction provides a clearstory 4 ft. 11 in. wide inside by 12¾ in. deep. The deck-sash ventilators are arranged in four groups, so that those in a quarter of the car can be operated separately from a lever near the center of the car. The ventilators swing horizontally and have an opening of 25 in. by 4½ in. This type of roof construction lends itself particularly well to the ventilation system using five ceiling fans in each car.

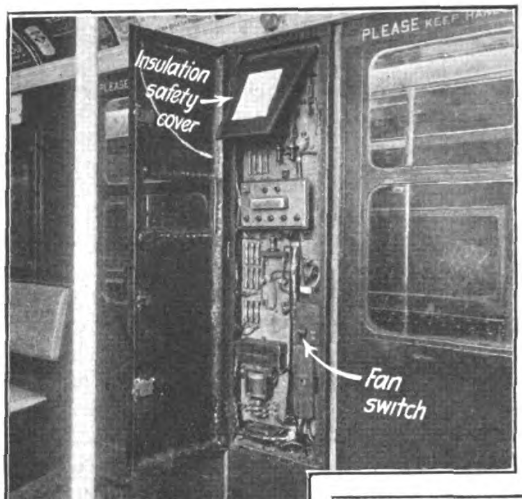
The five ceiling fans are arranged with one opposite the center pair of doors and the others at about equal distances along the center of the headlining. The five fans of each car are connected in series across the line, so that each fan is wound for 115 volts. The fan motor frame is designed for direct attachment to the car ceiling and a metal canopy incloses the top part of the motor.

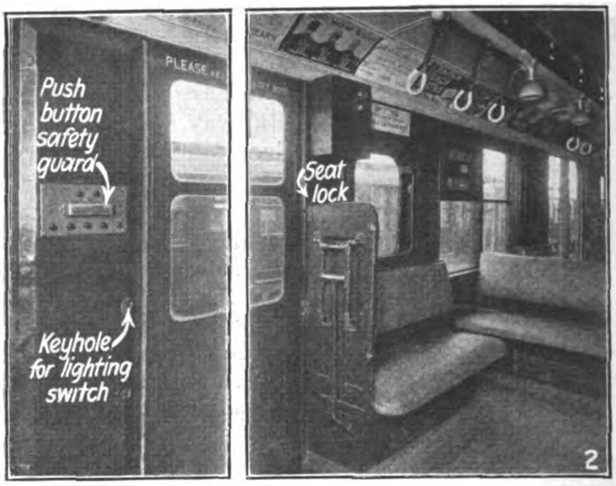
With the use of the ceiling fans the arrangement of lights consists of fourteen side lights, seven on either side, installed just at the edge of the clearstory, and six center lights, two of which are end lights. There is thus a total of twenty 56-watt lamps with shades per car. The fundamental principle of the seating arrangement adopted for the New York Municipal cars was to obtain maximum seating capacity during hours of normal traffic and maximum standing room plus a reasonable proportion of seating capacity during the rush hours. In order to facilitate movement to and from the door openings the space opposite each active doorway was kept free, except for vertical stanchions installed for the accommodation of standing passengers. Study of the conditions that existed with the cars loaded to their maximum capacity indicated that a few hand straps on either side of the door openings provide comfort for the standing passengers, and accordingly twenty-eight hand straps, fourteen on either side of the car, have been installed. These are grouped with two hand straps on either side of the end side doors and three hand straps on either side of the center pair of side doors. These are of the Henry type, all metal with white enameled hand grips, and arranged to be held back close to the side of the car by spring pressure when not in use.

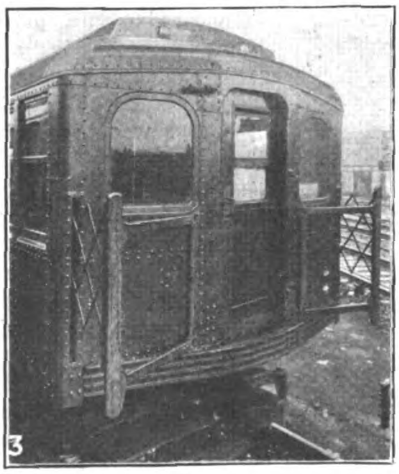
IMPROVEMENT IN FOLDING SEATS

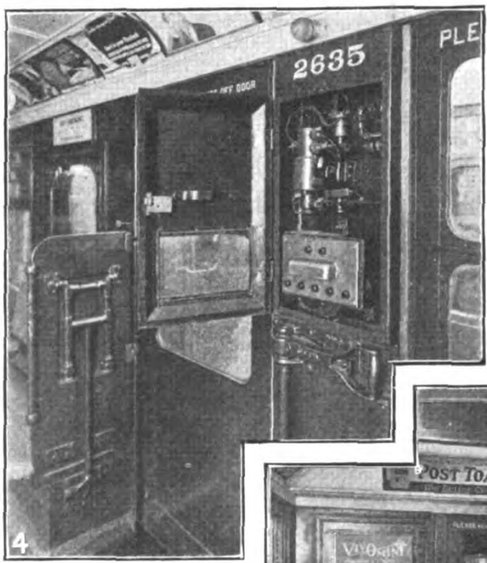
In order to increase the seating capacity during hours of normal traffic, hinged folding seats are used on either side of the door openings. In their raised position these folding seats serve as ends for the longitudinal seats and a grab handle along the front edge enables standing passengers to get a firm hold. These folding seats are held in their raised position by a lock catch which can be released only by the aid of the key used for the end doors and the operator's push-button box. With the seats in their "down" position a prop swings out from the under side and rests on the floor. This seat prop is made of a pipe framework with two legs which have rubber cushions at the points where they

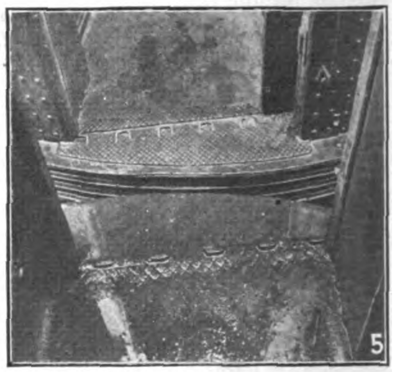
Some Features Embodied in New York Municipal Railway Company's Cars

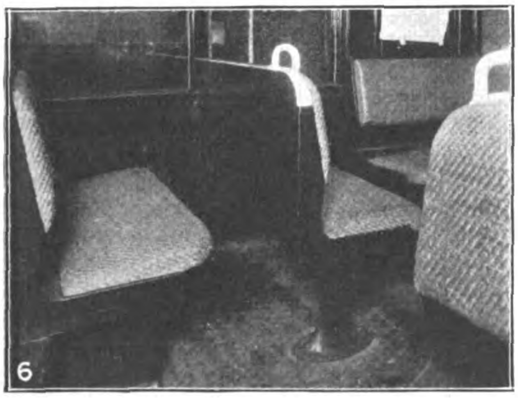

Insulation safety cover
Fan switch
1

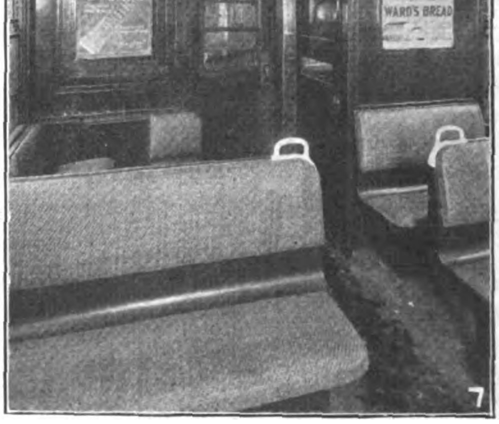

Push button safety guard
Keyhole for lighting switch
Seat lock
2

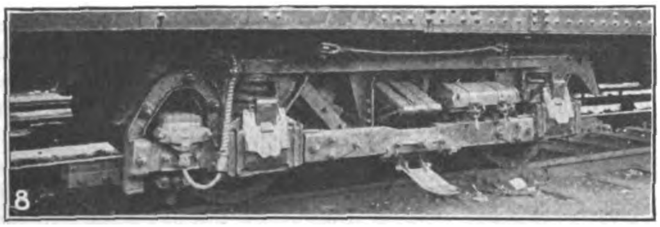


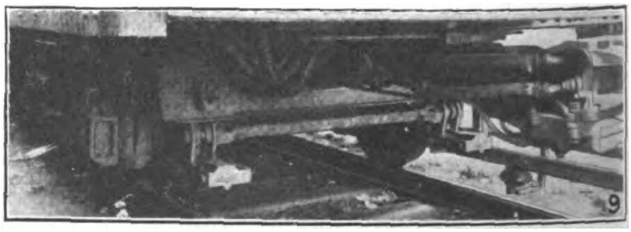







POST TOASTIES
WARD'S BREAD
7





1—Interior of switchboard panel.
2—Push-button section of switchboard panel, pipe framework footrest interlocked with door engine, cut out, coasting recorders, destination sign and hand straps.
3—Wide type pantograph shoes.
4—Small panel box with push-button switch, recess provided for hand brake.
5—Types of end-door threshold plates.
6—Cross-seat recessed to provide knee room for passengers in seat behind.
7—Paneling at end of car, design of motorman's cab door and end door with drop sash.
8—Truck mechanism, cast steel contact shoes and shoe-fuse box cover.
9—Safety hangers for truck slack adjusters and shoe hangers cross connected.

rest on the floor. All parts are rounded so that no sharp corners or projections are presented, which might prove injurious to passengers or their clothing, and as this framework is mounted so that it extends out from the side of the seat it also serves as a grab handle for standing passengers, with ample space for their fingers to provide against accident. A center leg of this framework is attached to a lever which is connected to the door engine underneath the stationary seat at this point. The lowering of the folding seat cuts off the air from the door engine, so as to insure that the door behind the seat cannot be operated with the seat in its down position.

It is the practice of the New York Municipal Railway to operate trains with the end doors of the several cars closed, and the seating arrangement provides a small seat just to the left of each end door with hinges, so that it can be raised but cannot be removed.

Two cross seats are located just to the rear of the motorman's cab. This is the only position in the car where two cross seats come one behind the other. To provide additional leg room for passengers in the rear seat, the back part of the front seat has been constructed with a cut-out portion, which comes just below the back seat cushion. By this ingenious arrangement, an additional 3 in. of leg room is provided for passengers without change in the other parts of the seat construction.

NO DANGER OF INTERFERENCE WITH MOTORMAN

To provide maximum privacy for the motorman the door of the cab has been provided with a steel panel in the top portion and a small length of wire-ribbed glass in the center portion. The bottom of the door is also provided with a dust guard, as it is found that with the car in motion a current of air from the end door blows in through the motorman's cab, particularly when the window is raised. Thus dust and other particles are blown under the bottom of the door. The steel panel in the rear of the motorman's cab is utilized for an advertising sign rack.

Several window positions have steel panels. One of these is just to the left of the end door and others are provided just to the side of the end side doors. The use of steel panels reduces the maintenance cost for broken glass considerably and also provides increased revenue from their availability as advertising sign racks.

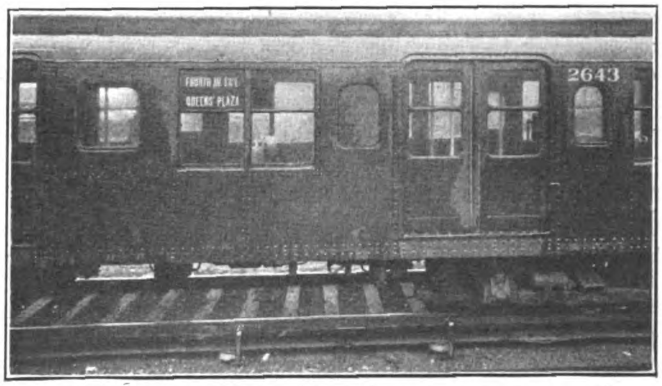
Drop sash have been provided in the end doors which are arranged for the dropping of the top part of the sash, the window being made in two parts. This gives increased ventilation and a circulation of air through the entire train.

In one of the accompanying illustrations showing exteriors of the cars the paneling of the small window to the left of the end-side doors can be seen. In these cars the car number has been placed on the side of the car over this window. It was found that this is preferable to numbered glass which when broken causes considerable delay in returning the car to service, as a new glass has to be numbered and the paint thoroughly dried before it can be installed. The routing and destination sign is located in the second window to the right of the center side doors. This location provides for use of signs with large letters which can be distinctly and easily read, and also gives more space for the sign proper, as the number of destinations and routes are increasing considerably due to the addition and operation of new lines.

In the illustration of the outside end of the car the pantograph safety gates are shown. A wide shoe now used insures proper contact even on sharp curves. Another view, taken between two cars, shows the threshold plates at the end doors. In the new design the outside ends have been cut off so that they extend but a few inches outside of the end doors.

ELECTRIC TRIP SWITCHES ADDED

In the views showing truck construction and equipment electric trip switches are shown at the left end of the truck. Two of these are installed per car on diagonally opposite corners. This truck mechanism for the trip switches consists of a lever which extends down toward the rail and engages the track trip. This lever is self-centering by heavy springs and acts through a gear and pinion to operate a contact device and open the circuit whenever it is operated. The opening of this circuit de-energizes the holding coil of an electro-pneumatic valve installed in the small cabinet over the push-button switches on the inside of the car. This electro-pneumatic valve operates a dead man's valve which opens the brake pipe and causes an emergency application of the brakes. As soon as the track trip has been passed, the truck trip switch returns automatically to its central position, closing the circuit at that point. However, the circuit still remains open, due to the dropping of the electro-pneumatic valve. A reset circuit is used for restoring the valve to its normal position, with a reset switch in each motorman's cab. There is also a pneumatic switch in this circuit, which is connected directly to the brake pipe. This closes whenever the brake pipe pressure has been reduced to 5 lb. or less. The electro-pnuematic valve can then be reset without the motorman moving from his cab, but as the brake pipe pressure must be reduced to 5 lb. before this circuit is closed ample time is given to insure that the train comes to a stop before the normal condition can again be re-established.



DESTINATION SIGN WITH LARGE LETTERS, AND NUMBER ON SIDE OF CAR

The cast-steel contact shoe is also shown in the second illustration, and the shoe-fuse-box cover. The cover is of wood, reinforced with wide steel bands having spring mounting.

The journal boxes provide substantial support for the shoe beams and heavy brake-shoe release springs assure prompt release from the wheels. Following the general practice in this design of providing safety straps for all brake-rigging parts, additional safety straps have been added under the truck slack adjusters. A cross-connection has also been added between the brake-shoe hangers at the end of the truck. This gives a rigid construction and prevents brake shoes from developing false flanges or wearing out of true.

All doors of a car are controlled from push-button boxes forming a part of switchboard panels located on either side of the car between the center pair of doors. The push buttons are arranged in three rows, those in the center row being for opening the doors. To energize any of the push buttons it is necessary for the operator to insert a key in the key switch at the upper left-hand corner of the box and to turn this to close the circuit to the button. As an extra safeguard on the opening buttons, a cast-bronze guard is installed over them. With this in place there is no danger of false operations with the cars in motion should the operator forget to remove his key from the key switch.

The lighting, heater and compressor switches are located at the top of the panel board. An ingenious method of preventing the operator from hanging on to the steel door of the panel board or other grounded metallic parts while he is throwing these switches involves the use of an insulated safety cover. This cover is hinged from a point just above the top of the switches, and in its normal position extends down so as to cover the switches and the fuses completely. In order to throw a switch it is necessary for the operator to raise this insulated panel, and the most natural method of doing this is to hold it in its raised position with the left hand while the switches are being thrown with the right hand. The operator must maintain his hold on this insulating panel, which insures his being insulated from ground without danger of receiving a shock should he inadvertently touch any live part. This insulated panel also forms a very conspicuous place for posting information regarding the various fuses and switches. All fuses and switches are given numbers on the panel board and the instructions tell what circuits they are used in, so that should trouble occur in service the operator does not need to test several circuits to find the trouble, but can locate it immediately by referring to the instructions.

CONVENIENT METHOD OF OPERATING LIGHT SWITCH

Another ingenious and trouble-saving device is the key-lighting switch, located at the right-hand center part of the panel. As these cars operate in the open as well as in tunnels, it is necessary to turn the lights on and off during each trip. With the usual type of lighting switch this would require the opening of the panel board door each time it was necessary to throw this switch. This requirement has been done away with by the use of a key switch in the lighting circuit which can be operated by the insertion and turning of a key without opening the panel board door. The keyhole for this switch is made with a large funnel-shaped guard, so that the operator can readily find the keyhole even should he neglect to turn the light on in the car until after it enters the tunnel.

This panel board also contains the switch for operating the ventilating fans. This is a safety switch located just underneath the safety lighting switch. All exposed parts of this switch are insulated, so that the operator cannot come in contact with any live parts.

The hand-brake handle folds back against the side of the car just underneath the small switchboard panel and is held in position by a safety catch. The steel side panel has been cut out just at the handle to provide additional space for the inserting of the hand for operating the hand brake.

The storage batteries of the car are charged from the line as well as through the compressor circuit. A battery-charging relay operates to connect the car batteries to line through a resistance whenever the pressure drops as low as 26 volts. With the batteries connected for charging directly from the line a 2-amp. charging current is received. The normal voltage for these batteries is thirty-four, and whenever this voltage is reached the battery-charging relay automatically cuts out. In normal operation the batteries are charged through the compressor circuit.

Electro-pneumatic line switches, Westinghouse type 267-E-9, are used on these cars. These are found desirable on account of the large number of times that the main operating circuit is opened and closed while going over gaps in the third rail.

Improvements in the electro-pneumatic brakes used provide for a quick application of the brakes throughout a train at all times whether they are applied pneumatically or with the electric features cut out. An indicating pilot lamp is connected so as to show whenever the brakes on a car are cut out. This pilot lamp is located inside the car just to the right of one set of the end side doors, and its conspicuous location insures that cars are not operated in service with brakes cut out unless it is essential due to trouble on that particular car. The motorman is then advised of the condition, so that safe operation is assured.

California Association Meets

THE sixth annual meeting of the California Electric Railway Association was held at the Palace Hotel, San Francisco, on May 11. At the close of the meeting W. R. Alberger, vice-president and general manager of the San Francisco-Oakland Terminal Railways, was re-elected president for a third term. W. V. Hill was re-elected manager, and the executive committee, composed of the following, also was re-elected: Paul Shoup, president Pacific Electric Railway; W. E. Dunn, vice-president Los Angeles Railway; William Clayton, vice-president San Diego Railway, and William von Phul, president Market Street Railroad.

W. V. Hill, the manager, is now in Washington, D. C., having accepted the office of Washington representative of the tax committee of the National Utilities Association.

Applying the Stethoscope to Machinery

A RECENT issue of *Engineering*, London, gives details of an ingenious scheme for permitting supervision of the condition of bearings and other vital parts of machinery. A specially constructed telephone microphone is screwed to each bearing or other possible source of trouble and supplied with current from a dry battery cell. All of these "trouble detectors" are wired to a central point where a simple switchboard permits plugging in of a telephone receiver on the circuits in succession. A milli-ammeter forms a part of the switchboard and is used to insure the continuity of the test circuit, so that silence in the telephone due to a broken circuit may not be taken as an indication of a perfect bearing. This device is an application and extension of the familiar stethoscope used by physicians in studying the action of the human heart. It virtually places the ear of the superintendent at every essential bearing in the plant.

Elimination of Waste

Report of Engineering Council's Committee Contains Concrete Suggestions Which Are Applicable to all Industries—High Labor Turnover One of the Commonest Wastes

THE report of the American Engineering Council's Committee on Elimination of Waste in Industry was presented on June 3 to the executive board of the Council in St. Louis. After discussion on the acceptance of the report, its publication was authorized not as a report of the Council but as the findings of the committee.

The report declares that between 4,000,000 and 5,000,000 workers were idle during January and February of this year, that billions of dollars are tied up in idle equipment and that high labor turnover is a rough index of one of the commonest wastes. Nationwide machinery to obtain continuous information concerning unemployment conditions throughout the country is called necessary, means for regularizing employment in the principal industries is urged and an elaborate plan of nationwide co-operation between the government, the public, trade associations, the industries, labor, bankers and engineers is outlined.

The waste inquiry was in charge of a committee of sixteen headed by J. Parke Channing of New York as chairman and considered particularly the industries of housing and building, ready-made men's clothing, shoes, metal trades and printing, but the results are said to be typical of all industries in all parts of the country.

The economic loss annually from preventable diseases and death according to the report is over $3,000,000,000; 42,000,000 persons gainfully employed lose 350,000,000 days from illness and disease and non-industrial accidents annually; 42 per cent of the wastes of ill health is preventable. In 1919 there occurred in industry 3,000,000 accidents, resulting in an economic loss to the country of about $853,000,000.

Trade associations, it is declared, should help and can do so, among other ways, by promoting programs for standardization of production of cost accounting methods, of material specifications and of equipment and by encouraging industrial research.

The duties of management include a reduction of the high labor turnover, establishment of improved relationship with employees, maintenance of inspection control, and detailed planning of work in advance.

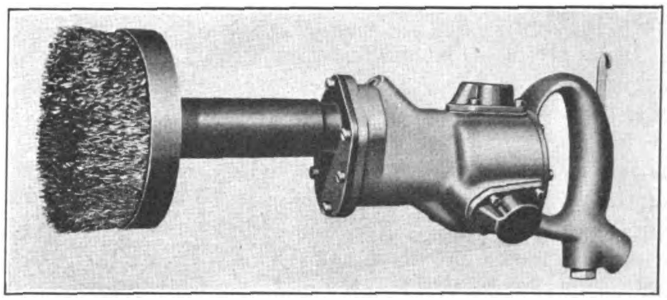
Organized labor, the report says, should develop a policy for increasing output; the attitude of opposition or indifference to proper standards for production should be changed to a frank and aggressive insistence on such standards; there should be a scientific examination of the bases for wages; certain union rules should be modified in regard to machine operation, apprentices and craft distinctions which result in restriction of output, and individual workers should realize their responsibilities for waste resulting from ill health and disregard of safety measures.

The banking interests, it was said, should especially encourage the stabilization of industry, and it is the duty of the engineers of the nation to support a wide and more thorough research into the following problems: Collective bargaining, hours of labor; methods of compensation; means of preserving and stimulating the creative instincts and the pride of craftsmanship of industrial workers; a standard labor and management terminology; common principles for the methods of management, and the measurement of production standards.

The building industry was said to be about 60 per cent efficient. In the shoe industry the waste is put at about 35 per cent. The average plant in the metal trades group is from 25 per cent to 30 per cent behind the best plant in output per employee. In the ready-made clothing industry, the report says, it should be relatively easy to save three-quarters of a million dollars a day—an increase of 40 per cent in effectiveness.

Wire Brush Cleaner Attachment for Air Drill

WIRE brush cleaning of metal surfaces offers an opportunity for saving time and labor over that required by hand methods for removing paint, rust, scale, etc. Manufacturers have found difficulty in obtaining a wire brush of proper design and material which would work effectively and still not wear out too rapidly. A wire brush of very rugged design has recently been placed on the market by the Ingersoll-Rand Company, New York, which is intended for use with its standard No. 6 "Little David" drill. The face diameter of this brush is 5 in. and the wires are made of special heat-treated steel, which has been found to possess good wearing qualities.


AIR-OPERATED BRUSH CLEANER ATTACHMENT

The No. 6 drill which is used with this brush has bearings designed particularly to take up the end thrust when pressing down on the work and the motor has a particularly high speed, which is also desirable. The whole outfit weighs but 11½ lb.

A New Structural Material

A NEW structural material called "Plymetl" has been produced by the Haskelite Manufacturing Corporation, Chicago. It is a composite of wood and sheet steel. It is manufactured by cementing thin sheet-metal faces to a relatively thick core of light-weight material. The two sheet-metal faces form smooth, impervious and durable surfaces. The non-metal core places the faces relatively far apart, giving the material great strength for its weight. Plymetl is furnished from stock in panels 3/16 in., ¼ in. and 5/16 in. thick, with faces of black or galvanized sheet metal, No. 30 gage, and with planed fir wood veneer cores. These panels are made 30 in. by 96 in. and weigh 1.6 to 1.8 lb. per square foot. It is also manufactured to order in 24, 26, 28, 30 and 36-in. widths and in lengths of 96 and 120 in., and in thicknesses from 3/16 in. to ¾ in. The material can be cut with light machine shears and such cutting gives a desirable bevel to the edges.

A panel of this material, 5/16 in. thick and made up of No. 30 gage sheet steel and fir wood core and weighing 1.8 lb. per sq.ft., is claimed to have eighty times the stiffness of a sheet steel of the same weight, namely, No. 19 gage. Its elastic limit in bending is claimed to be about five times that of the No. 19 gage sheet steel. The shearing strength of the cement that binds the metal to the core is even greater than the shearing strength of the wood.

Some of the advantages claimed for this new product are that it is strong and of light weight, that the even surface afforded by the metal does away with the cheap appearance of sheet metal, that the wood core takes away the metallic sound of sheet metal, and that the material will stand great abuse. Its use is suggested for car roof, interior panels, bins and shelves.

Repairing Decayed Poles

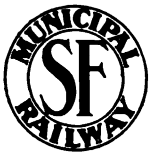
THE George C. Eggers Company, distributer of the Harding process for the reinforced concreting of pole butts, has given some results of the use of poles with concreted butts used by the Kootenai Power Company at Cœur d'Alene, Idaho. These have now been in service about six years.

In applying this method the ground is excavated around the butt. All decayed wood is removed and the butt of the pole is brush-treated to a height of 2 ft. above the ground line. A template is then adjusted around the butt of the pole at the proper height and twelve nails for supporting the reinforcing iron and the sheet metal form are driven to the proper depth. The template is then removed, the rings are put in place and the vertical tension rods are hung on. The lower form is then wrapped around the six lower nail heads and is backed up with earth as it is being filled with concrete. The lower form is next withdrawn and the upper form is adjusted at the proper height around the upper and lower nail heads, and a rubber form for casting the sealing groove is wrapped around the pole and tacked in place. The upper form is then filled with concrete and the top is sloped and smoothed off by means of a trowel. After twenty-four hours the forms are removed. When the concrete has become thoroughly dry the groove around the pole as well as the checks in the pole itself are well filled with a special sealing compound which is applied hot. The use of this process makes it unnecessary to replace old poles due to ground-line rot, as the concrete reinforcement can be applied to give a substantial construction and add much life to that of the pole.

DECAYED POLE WITH CONCRETE BASE APPLIED

Seal Replaces Lettering

A CONSIDERABLE saving in paint and painters' time is expected to result from a recent decision to do away with all lettering on the San Francisco Municipal Railway cars and to substitute a simple seal. Inasmuch as the municipal cars are painted a distinctive gray color, the seal will serve all purposes as well as the more elaborate lettering, it is believed. The seal bears the words Municipal Railway in letters 1¾ in. high encircling the letters S. F. All letters are of gold leaf with 1/16-in. black borders. The diameter of the outermost circle is 15 in.



SEAL

Letter to the Editor

Stick to Safety-Car Design Standards

BROOKLYN RAPID TRANSIT COMPANY
BROOKLYN, N. Y., June 6, 1921.

To the Editors:

I have read with much interest the article by J. C. Thirlwall of the General Electric Company appearing in the issue of the ELECTRIC RAILWAY JOURNAL for April 16, 1921, and again the article of May 7 by W. H. Heulings, Jr., vice-president and general sales manager the J. G. Brill Company, both emphasizing the fact that there is no real reason for changing the design of the standard Birney safety car. I write to indorse their views.

It is one of the unfortunate phases of the electric railway industry, excusable in part on account of its newness, that some men in responsible charge of executive and operating departments believe that they are not measuring up to the expectations of the owners of the property and their local public unless they stamp their own individuality upon the property. They alter railway equipment that has proved generally successful elsewhere, forgetting that the real field for effort lies in the direction of initiative in design rather than in such changes. We are far from having reached standards in any respect, and in the field of car equipment it is improbable that one or even two or three types of cars will ever be generally adopted for general use. While the advantages to the purchaser of standardization are obvious, individuality in design on the part of the car builder, often involving patents upon parts, and the attitude of the purchaser in desiring to adhere to designs which are locally popular or which fit in with some well-founded policy, make such a course impracticable if not impossible.

It is particularly unfortunate, therefore, that certain properties should be engaged in efforts to make changes of doubtful value in the Birney safety car, the one prominent example of standardization falling within the scope of car design. It is the only example of consequence that illustrates what might be termed *standardization of design or direction of design.* Great credit is due the man who first conceived the idea of this car and those interests that first applied it. But credit is also due the manufacturers who have co-operated with the users in developing a standard car with standard electrical and mechanical equipment that has done much to keep down the initial price of the complete unit and to make possible prompt delivery of repair parts at reasonable cost. All of the manufacturing interests concerned are represented by a manufacturers' committee, of which the writer and one other railroad employee are members. In this every consideration is given to the further improvement of any part or feature of the car and its equipment and with especial reference to keeping down car weight. The sentiment is against increasing the weight without a real and compensating advantage.

Probably many one-man double-truck cars will be operated in the near future, cars fully equipped with the safety devices now used on the Birney car. I believe that there will be a very general adoption of such cars, either through the modification of existing cars or the acquisition of new units more suitably equipped for economical operation. But this is entirely separate from the suggestions that have emanated from a few quarters to the effect that "something different" be furnished, thereby entailing additional first costs and future operating costs.

What is needed are broader conceptions of the principles involved, closer co-operation with the manufacturers in the development of standard railway equipment of whatever character, and less effort to change unnecessarily what some one else has designed in the effort to obtain the highest efficiency and the greatest economy in the management of properties that now need such a service as never before.

W. G. GOVE,
Superintendent of Equipment.

Association News

Committee of One Hundred to Give Dinner

ANNOUNCEMENT has been made this week of a dinner party to be held on July 8 at the Commodore Hotel, New York, to celebrate the second anniversary of the creation of the Association's Committee of One Hundred. The dinner will be at 7 o'clock and the tickets are priced $7.50.

Each member company is invited, under the plan of holding the dinner, to send one accredited delegate. In addition the members of the Committee of One Hundred are also extended an invitation to attend.

The speakers' program calls for a review by President Gadsden of the activities accomplished during the existence of the Committee of One Hundred and an outline of what can properly be done in the future. In addition there are to be other speakers of prominence who are to talk on subjects that pertain to national situations other than the electric railway problem.

Recent Presidential Appointments

PRESIDENT GADSDEN of the American Electric Railway Association, chairman of the joint tax committee of the National Utilities Association, has appointed W. V. Hill, manager of the California Electric Railway Association, as representative of this committee. Mr. Hill's office is located at 950 Munsey Building, Washington, D. C., and all matters relating to federal taxation can be taken up directly with him there.

President Gadsden has appointed several new members on the American Association committee on company sections and individual membership, the personnel of which is now as follows: Martin Schreiber, Public Service Railway, Camden, N. J., chairman; P. S. Arkwright, Atlanta, Ga.; J. P. Barnes, Louisville, Ky.; F. G. Buffe, Kansas City, Mo.; J. H. Mallon, Chicago, Ill.; H. H. Norris, New York, N. Y.; Charles C. Peirce, Boston, Mass.; E. F. Wickwire, Mansfield, Ohio.

Chicago Men Well Entertained

THE monthly meeting of the Chicago Elevated Railroad company section was held on May 17, with an attendance of about 150, with President J. H. Mallon in the chair. F. W. Shappert, who accompanied Secretary Denby on his recent inspection of the Atlantic fleet, reviewed this event with the aid of stereopticon slides. H. A. Johnson, organization engineer Chicago Elevated Railroads, talked of his recent trip through the West as the representative of the Elevated Railroads on Mayor Thompson's Chicago transportation committee.

Stock Offering to Employees at Section Meeting

THE regular monthly meeting of company section No. 13 was held on May 19, at Camden, N. J., with a large attendance. President C. V. Wallace introduced E. G. C. Bleakley, city solicitor of Camden, who, in his talk, spoke on the way in which the general public left the responsibility to the operators of the trolley cars, depending on them for their safety and speed in being taken from town to town. He added that the trainmen not only received the pay which comes in an envelope but also that which comes from the appreciation of the daily riders, who place their confidence in these worthy men for work well performed. Martin Schreiber, manager of Southern Division Public Service Railway, outlined the plan of the Public Service Corporation under which it plans to sell $2,000,000 of cumulative preferred stock to the general public and employees at the par value of $100 per share, payable $10 down and $10 monthly. The stock is to pay 8 per cent, and 6 per cent is allowed during the time that payments are being made. He outlined also the many advantages to be derived from having the general public as part owners of the corporation.

Spraying Car Cleaner Fluid

AT THE Wheaton Shops of the Aurora, Elgin & Chicago Railroad H. A. Barbero, master mechanic, is working on a plan of using Wilson ONC cleaner by spraying it on under the 90-lb. shop air system pressure, instead of rubbing it on by hand. The hand method of cleaning takes four men about four hours per car. Experiment has gone far enough so that it is thought that four men will be able to clean a car in one hour with the spray method, assuming that proper equipment is afforded, including a tank at either side of the car. The present facilities at the shop are limited and it is necessary to place the car first on one track and then on another in order to get space in which to spray both sides. It is planned to build a shed outside of the shop particularly for car-cleaning.

The ONC cleaner is diluted with water and the car sprayed all over and then permitted to set about ten minutes. A wet brush on a long handle is then run over the car, windows and all, and they are rubbed as much as can be with this soft brush. The whole car is then rinsed down with a fountain brush. This latter process avoids the necessity of wiping the windows. The spray process requires about one-quarter more of the fluid than the hand process. At the same time, it saves considerable labor and provides a cleaner car, mainly because it will be possible to clean it more often with the same force of men. The present cleaning system is inadequate, though it is costing the company a large sum. At the Chicago terminal alone $35 a day is being spent for cleaning cars on the inside only. It is planned ultimately to do away with this $900 a month charge entirely at Chicago by concentrating all of the car-cleaning work at the shops, and it is believed that this can be done with the present working force under improved methods.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Railroad Labor Board Cuts Wages 12 per Cent

Highest Reduction of 18 per Cent on Section Workers Should Provide Stimulus to Track Construction

Reductions in the pay of railway workers averaging 12 per cent for all classes of employees have been authorized in the decision of the United States Railroad Labor Board handed down on June 1. The decrease becomes effective July 1, on which date the national working agreements are also abrogated. Nullification of these agreements, it is estimated, will mean a saving of about $300,000,000 annually to the railroads of the country, while the wage decrease is expected to lop off about $400,000,000 more.

The decision in general grants reductions of from 5 to 13 cents per hour or about 5 to 10 per cent, and reduces section laborers approximately 18 per cent, in this instance completely wiping out the increase in pay granted that class of employees in the $600,000,000 wage increase of July 20, 1920. On other classes of workers, however, the wage reduction does not meet the increase in pay granted last year, and some disappointment over this has been expressed by the railroads. It is significant, however, that the largest decrease, or 18 per cent, affects section workers, for with lower costs in maintaining and constructing track, greater activity in this much neglected field may logically be expected.

Segregation of City and Suburban Lines Talked

While no definite future policy has been announced for the Detroit United Railway since the election of Harrison Williams and Alex Dow as directors, city officials believe that one of the main steps to be taken by the new organization will be the segregation of the city lines from the interurban system. It is also believed that the policy indicated by the company in agreeing to sell the day-to-day and non-franchise lines at such times as the city desired, and in agreeing to co-operate with the city in the matter of crossings by the municipal line, will be followed with a view to harmonizing the company and the city in the city's municipal program.

If complete harmony results, the disposal of the company's entire city system to the city would ultimately result in bringing about a unified municipal system, although it is not believed by city officials that a project to take over at one time the entire city system of the Detroit United Railway would be approved by the voters.

Following the defeat of the service-at-cost ordinance at the April election the company signified its willingness to allow the city to make crossings at the intersection of the municipal ownership lines and the company's lines. Agreement has been reached between the company and the city providing for submitting the matter of crossings to the United States Bureau of Standards.

The city officials hold that the company and city should share equally the cost of crossing non-franchise and day-to-day lines, while in general practice the junior system bears the entire cost. The Corporation Counsel claims that the company has no rights on such streets except by permission of the city. Company attorneys do not accede this point and cite that the company is willing to sell the non-franchise lines on Fort Street and Woodward Avenue when the people vote to purchase them.

D. U. R. in Charge of Administrative Committee

Announcement was made in New York on June 7 that the operating properties of the Detroit (Mich.) United Railway will be in charge of an administrative committee composed of Harrison Williams, New York, as chairman; Alex Dow, president of the Detroit Edison Company, recently elected a director of the railway; J. C. Hutchins, A. F. Edwards and R. W. Martin. This committee, just formed, will immediately consider the problem with which the Detroit United Railway is confronted. At the present time there is no announcement to make regarding any future plans or policies. It is not anticipated that any further changes will be made at this time in the board or in the operating organization.

Third Des Moines Arbitrator Chosen

After more than a month's dickering in trying to secure a third arbitrater to hear the wage dispute between the Des Moines (Iowa) City Railway and its union employees Judge Scott M. Ladd, for many years member of the Iowa Supreme Court, was agreed upon by Rev. J. E. Kirbye, for the men, and B. F. Elbert, for the company. By reason of the fact that Rev. Kirbye plans to leave for Asia on June 22 it is thought that the wage dispute will now be pushed to a speedy settlement.

California Legislation Reviewed

Tax and Labor Bills Defeated Which Would Have Burdened Electric Railways Further

More than seventy bills were introduced at the recent session of the Legislature of California effecting directly or indirectly the electric railways of the state. The two most important measures were those dealing with taxation and hours of labor. A tax bill was introduced during the first half of the session providing for a uniform increase of 33 per cent in taxes of public utilities. As an illustration the bill proposed to increase the electric railways tax rate from 5¼ per cent of gross receipts to 7 per cent.

This measure resulted in one of the bitterest fights that has ever been waged in the Legislature of California. The first bill having passed the Senate was defeated by a narrow margin in the Assembly, whereupon a very similar bill was introduced in the closing hours of the first half of the session.

During the thirty-day recess the Governor and his administration stumped the state in advocacy of the passage of this measure. The public utilities and the banks, however, carried on an intensive campaign taking the position that, first, public utilities and banks were paying their just proportion of taxes as compared with general property taxes; second, that the state government was extravagant. They presented figures to substantiate the first claim and submitted facts with respect to the second claim showing that the budget could be cut many millions without impairing the proper functioning of the state's business.

The second bill passed the Senate by a margin of one vote, but was defeated in the Assembly by a margin of four votes. On reconsideration, however, over a period of ten days the Governor's machine supported by the farmers' association (fearing an ad valorem tax on their property), automobile interests and labor organizations, the bill was finally passed by the necessary two-third vote which is required on revenue measures. The electric railways succeeded, however, by an amendment to the bill, in avoiding the increase tax, but their representatives refused to abandon the fight after their interests were excluded from the measure. Thus about $3,000,000 will be saved to the electric railways during the next two years.

Companion bills providing for an eight-hour day within ten hours for electric railway platform men were introduced and were strongly supported by representatives of the Amalgamated Association. The Senate bill was reported favorably out of committee, but was defeated on the floor of the Senate by three votes after a strenuous fight. The Assembly bill was then taken up in committee, amended to read nine hours within eleven and was defeated in committee.

The bill against the one-man car was not taken up, the author realizing that it could not be passed. The electric railways were involved in an amendment to the "full-crew act," which bill was defeated in committee. Numerous bills were defeated, limiting the Railroad Commission's power with reference to contracts and franchises. Other bills were defeated requiring gangways or sidewalks along bridges, prompt adjustment of damage claims, construction of caboose cars, septic toilet retainers, abolition of grade crossings. The electric railways were excluded by amendments to other bills affecting their interests.

The indeterminate franchise bill in which all public utilities were interested passed the Assembly by a substantial majority, but was not pressed for passage in the Senate, owing to strong opposition brought to bear by the Governor as a result of the defeat of a bill providing for a power commission and the fight made by the public utilities against the tax bill.

A bill was passed repealing the paving section in the state statutes, which should bring considerable relief to the electric railways providing the Governor can be induced to sign it. Several bills were passed affecting the jitney interests, requiring them to file reports of their operations with the Railroad Commission and subject to restrictions on the issuance of free and reduced transportation; also placing them under constitutional amendment No. 1, relating to taxation, under which other public utilities are classified for taxation, and a bill imposing a 2 per cent license tax on motor carriers, which will apply until the amendment to the constitution becomes effective.

A constitutional amendment reclassifying public utilities for taxation purposes was passed. This will enable the electric railways to be classified separately from the steam railroads. On this measure the contention was made that the electric railways should be given a lower percentage than that of the steam railroads owing to the additional burdens imposed in their franchise conditions.

It is interesting to note that the automobile interests maintained the largest lobby of any interests represented.

Wage Reduction to Be Made.—Britton I. Budd, president of the Chicago, North Shore & Milwaukee Railroad, has notified the employees of the company that effective on June 16 working conditions will be revised and wages reduced. The amount of the reduction and other changes to be made are under negotiation.

$1,022,276 Program

Duluth Company Gives Details of Work to Be Carried Out in Next Two Years.

Improvements, extensions and new equipment involving expenditures aggregating $1,022,276 are planned by the Duluth (Minn.) Street Railway within the next three years, according to schedules filed by the company with the State Railroad & Warehouse Commission supporting its previous request for an emergency fare of 7 cents or four rides for a quarter.

The program outlined includes several extensions which have been long contemplated, the construction of additions to the general shops at a cost of $305,000 in addition to the purchase of considerable equipment and the relaying of several tracks.

In setting forth its financial condition, the company asserts that if it were forced to comply with the City Council's request of Jan. 10 last for increased service it would have to spend $145,000 more annually for the increased cost of operation, or more than the company has been able to credit to profit and loss in any one of the last three years.

In addition, the company claims, it would have to lay out $196,000 in new equipment and it now faces litigation in which the city is asking more than $108,000 on account of paving about the track space on various streets.

A total of $345,000, or approximately one-third of the total expenditure, is planned for 1921, in the event that the request for an emergency fare of 7 cents is granted. If the commission grants the emergency fare the new rate will hold until engineers employed by the city and by the company have presented their figures on the company's valuation. After that the law provides that the permanent rate of fare shall be based so as to permit a reasonable return on a fair valuation of the company's assets.

The classification of the proposed expenditure of $1,022,276 for the next three years is briefly as follows:

In 1921	
Relaying tracks account street paving	$211,784
Conduits and underground feeders	46,683
Building improvements and renewals	23,134
New tracks	11,400
New equipment	55,000
In 1922 and 1923	
Relaying tracks, account street paving	$88,745
Conduits and underground feeders	8,270
Building improvements and renewals	345,100
New tracks	115,158
New equipment	120,000

The following is the income and expense account as presented to the state commission:

	1918	1919	1920	1921*
Operating revenues	$1,263,873	$1,477,701	$1,486,053	$475,931
Operating expenses	984,717	1,215,092	1,203,314	380,460
Net revenue	279,156	262,609	282,739	95,471
Operating income	209,972	177,937	192,206	65,956
Gross income	226,317	196,222	212,130	73,059
Total deductions from gross income (interest on bonds, amortization and miscellaneous debits)	127,311	125,382	125,618	41,734
Net income transferred to credit of profit and loss	99,005	70,840	86,511	31,325

* Four months.

Argument Concluded for New Plan at New Orleans

After several conferences with the City Commissioners and the Mayor, C. C. Chappelle, utility expert, brought to a close on June 3 his advocacy of the "assured service" railway plan for terminating the city's railway troubles. Mr. Chappelle in concluding his argument for the immediate adoption of the plan submitted by him drew a gloomy picture of the future of the city and the fate that awaited its people if those interested in its welfare delayed action further in the matter.

According to Mr. Chappelle the railway is carrying 50 per cent more passengers now than were carried in 1910 and has fewer cars now with which to do the work. Those responsible for the future of the company could not accept a valuation of less than $44,700,000 as a basis of settlement.

Wage Cut Accepted at Toledo

Trainmen in the employ of the Community Traction Company, Toledo, Ohio, accepted on June 7 the proposed wage scale of 45, 57 and 60 cents, which has been in operation for two weeks. They will continue their efforts to retain their vacations with pay. This matter was not voted on.

Negotiations for a new scale have continued since March. Two weeks ago the new scale was fixed by the company and since that time the men have been at work while international union officials attempted to have the matter arbitrated.

The men were first offered a cut of 2 cents an hour from their maximum of 60 cents. This was flatly turned down and further negotiations extended after the time of settlements made at Cleveland and Detroit, which cities set a pace for Toledo.

In addition to the cut of 10 cents an hour several changes in working conditions are also included in the new agreement. Overtime pay will be effective after nine and one-half hours' work rather than after ten as first proposed in the new agrement. Arbitration of wages is not provided for in the new service-at-cost franchise.

New City Official Suggests Settlement

Corporation Counsel Rules City May Control Buses and Fix Adequate Fares for Railway

Judge Miller, the new corporation counsel at Des Moines, Ia., has pointed out the way for the settlement of the railway problem there. Individual members of the Council have also expressed their opinions freely, but tangible action still remains to be taken. It is generally agreed that a settlement must be brought about quickly if Des Moines is not to suffer irreparable loss through further disintegration of its railway system.

REMOVAL of equipment from the substations and central power station of the railway was simply a business arrangement to which the General Electric Company was forced by the inability of the railway to meet payments due on the equipment supplied by the manufacturer.

At the very time the General Electric Company was authorized by Federal Judge Martin J. Wade to seize the equipment approximately $90,000 of the cost of the equipment remained unpaid. No criticism of the equipment was in any way attached and officials of the railway publicly announced that they could offer no objections to the General Electric Company starting suit to recover the property.

New Franchise Burdensome

The entire Des Moines case offers an almost impossible situation to an unprejudiced observer, particularly one who is not a resident of the city. Five years ago, before the United States had entered the war that turned business conditions upside down, the railway sought and was granted a twenty-five year franchise with a fixed fare of 5 cents with six tickets for a quarter.

As the purchasing power of the dollar declined the railway, in common with many other public utilities, began to feel the pinch of the franchise rate provisions. In the summer of 1919 the question was submitted to the people of granting the company relief in the shape of a 7-cent fare. The proposition was defeated.

Shortly after this the North American Construction Company, Chicago, which had rebuilt the Des Moines plant, brought action to throw the company into the hands of a receiver, and since that time the company has been operated under the direction of the federal court with F. C. Chambers, general manager, and Homer A. Miller, a Des Moines banker, as receivers.

Court Increased Fare

Last August Judge Wade over-rode the franchise provision and allowed a 6-cent fare. This failed to furnish sufficient revenue to meet wage awards secured to the men through arbitration and later there was a material service cut. A few months ago Judge Wade again reviewed the case and upon the agreement of the railway to increase service approximately 45 per cent he granted an 8-cent fare.

With the fare increased to 8 cents a flock of motor buses appeared, handling largely the short haul business and charging a nickel fare. By this time wage and salary reductions were well under way and Des Moines in common with the rest of the country suffered a considerable business depression which to a great extent still prevails.

The bus operators pooled their interests and have a fairly compact organization. They operate almost exclusively along railway lines and have picked up the cream of the business. Their service, however, is intermittent and unreliable. As an example Des Moines had her heaviest snow of the winter after the middle of April. Buses were helpless until the streets had been cleaned by railway sweepers.

With their incomes decreased Des Moines people have looked at the 3 cents to be saved by patronizing the autos, have ignored the merits of the question and have ridden in the buses, with the result that for the past three months the railway has been operating at a deficit which has been increasing steadily.

When the General Electric Company refused to wait longer for payment on equipment supplied and Judge Wade allowed a 46 per cent service cut, fair-minded citizens were of the opinion that this would serve as the last straw and that the city would be so aroused that the agitators would be squelched and a way found to settle the difficulties.

Problem Allowed to Drift

To date this has failed to be the case. Des Moines has sat placidly back and let the railway problem take care of itself. It is true that a Chamber of Commerce-Greater Des Moines committee has three representatives working on a service-at-cost franchise and that a few organizations have held meetings but there has been no general popular demand for a solution.

The City Council has been as lackadaisical as the citizens and even in the face of advice from its new corporation counsel that it had the right to take the situation into its own hands, rule the buses off the street and fix a fare which would permit the railway to operate successfully, no real steps have been taken to bring the farce to an end. Five days have elapsed since Judge Miller sent his first communication to the Council and on June 6 he reiterated the opinion expressed by him previously, in answer to a newspaper editorial. There have also been newspaper interviews from individual members of the Council, but nothing tangible has been done.

More than a week ago the president of the bus owners' association said that if the city would grant a franchise for a definite term of years they would put eighty buses in service and guarantee to handle the traffic. To date the matter has been entirely newspaper talk, and nothing has developed.

Judge William E. Miller, newly appointed Corporation Counsel in Des Moines, Ia., who has displaced H. W. Byers in charge of litigation between the city of Des Moines and its public utilities, forecast a complete change of front for the city in its relations with the Des Moines City Railway in a sweeping opinion which he filed with the City Council late during the week ended June 4.

Judge Miller not only advised the Council that it had full power to rule the buses off the streets, but that it had the power to increase railway rates without a vote of the people. He held that the franchise ordinance passed a few years ago was invalid.

Judge Miller suggests that the buses be ruled off the streets entirely or be compelled to operate on streets other than those occupied by railway tracks. A portion of his opinion is as follows:

> Assuming that the city through its Council had and has power to regulate fares by franchise, contract or by ordinance (a power the city never had and does not have now), and assuming that the 5-cent fare and transfer privileges provided for do not yield a fair return to the owner, it would be within the power of the Council to change the fare provisions.
>
> The state courts have held that a franchise ordinance or a contract between a city and public service corporations fixing a flat rate as is done in your ordinance No. 2406 is invalid. Cities such as Des Moines have no right to fix street car rates. The rate clause in the franchise ordinance No. 2406 is and always has been void.
>
> It is manifest that the competition of the buses is proving ruinous to the railway. The company shows an estimated deficit of $46,000 a month. A new franchise, however liberal in its general terms, would not remedy this condition if unfair competition were still permitted. Ordinances passed by the Council regulating buses could be revoked at any time. The way is open to you to remove the buses that are competitors destructive of the railway. It may be they could serve in other territory without material detriment to the car company. There is an obligation on the part of the city not to obstruct efficient car service.
>
> I am inclined to believe, or at least to hope, that if the foregoing propositions are wisely and fairly handled a strong inducement would be furnished the owners of the Des Moines City Railway and its creditors to back the enterprise with additional funds and rehabilitate the physical property.

Judge Miller's stand is a complete opposite to the baiting methods adopted and maintained by Mr. Byers during his ten years as Corporation Counsel. It came as a surprise to members of the City Council when read to them in open meeting. No definite action was taken at the meeting.

Iowa Electric Railway Association

The Iowa Electric Railway Association will hold its annual meeting at "The Inn," Lake Okoboji (near Spirit Lake, Iowa), on June 24, 1921.

The Iowa Section, N. E. L. A., is holding its annual meeting at the same time and place, and it is intended that on Friday morning a joint session will be held to consider subjects of mutual interest and on Friday afternoon a separate "round-table" discussion of matters of particular interest to street railways will be conducted.

Wages Cut Materially in Jackson

New rates of wages were put into effect by the Michigan Railways, Jackson, Mich., on June 1. These rates in cents per hour compared with previous rates are as follows:

	June 1, 1920 to June 1, 1921	June 1, 1921 to June 1, 1922
City Divisions		
First twelve months	60	44
After twelve months	62	46
One-Man Safety Cars		
First twelve months	60	49
After twelve months	62	51
Interurban Divisions		
First six months	65	49
After six months	70	54
Extra Work		
Work in excess of regular runs	10 addl.	5 addl.

Extra men are not to participate in the 5 cents per hour additional until they have been in the service of the company for six continuous months. City men transferred to interurban work will participate in the 5 cents an hour additional after they have been in interurban service six months.

Wage Cut Proposed by Jersey Company

Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., operating about 1,000 miles of line, has notified William Wepner, of the Amalgamated Association, that the company cannot renew the present contract with the men. That agreement expires on Aug. 1. The present scale calls for 51, 53, and 55 cents an hour. Mr. McCarter desires to revert to the award of 41, 43, and 45 cents an hour made by the War Labor Board in 1918.

In his communication to Mr. Wepner, Mr. McCarter says:

> It must be apparent, I think, to you and your associates that these companies are not in a position to pay the rates of wages set forth in the draft of contract nor to continue after Aug. 1 the rate of wages now being paid.

While no distinct mention is made in the correspondence of the new scale sought by the men it is understood that the employees desire a continuation of the present rates, but seek important changes in the other terms of the operating arrangements. In their communication to Mr. McCarter the men, through Mr. Wepner, "respectfully insist that the financial condition of any company does not determine a reasonable and living wage and further protest that the profits of an industry shall not be obtained through the unreasonable lowering of any already very low standard of living."

Mr. McCarter refers to the recent unsuccessful effort of the company to obtain relief in the matter of advanced rates, also to the inability of the company to secure just consideration at the hands of the public authorities with respect to the regulation of the jitneys. In this connection he says:

> Thus far, however, all its efforts have failed, and in addition to having had practically no money for the depreciation reserve account and none whatever for dividends it has lost upward of $2,000,000 in operating the property in the last three years.

Mr. McCarter said in his communication that quite a number of matters of lesser importance than the question of wages are referred to in the draft of contract submitted, and suggested that these could best be threshed out to a friendly basis of agreement by negotiations between the committee of the union and the company's own operating forces.

Byllesby Property Suffers Loss

The greatest damage to electric railways in the recent Colorado flood was suffered by the Arkansas Valley Railroad, Light & Power Company, a Byllesby property operating in Pueblo. This loss is estimated at $100,000. One of the officials of the company has announced that electric current would be supplied by the Colorado Fuel & Iron Company. He said he was confident of being able to run the electric cars in a few days. Every attention is being given to equipping the local utilities so that operation will be resumed as early as possible.

News Notes

Railway Opportunity at Miami.—The Miami Chamber of Commerce and all other civic bodies, as well as the City Council, desire to secure an electric railway for the city. They will gladly assure their assistance in getting a franchise without restrictions as to rates, paving of streets or other outside expense. Additional information may be obtained from the City Council or the Chamber of Commerce.

Arbitrators Selected for Wage Matter.—The five arbitrators have finally been selected to hear the arguments of the Utah Light & Traction Company, Salt Lake City, Utah, and its employees over the proposal of the company to reduce wages 25 per cent. The five arbitrators are: George H. Dern, the neutral member; A. L. Hoppaugh and Stephen H. Love, representing the traction company, and George H. Islaub and James H. Wolfe, who represent the employees. The first session of the arbitration board was held on May 27.

Interurban Men Accept Cut.—Trainmen and freight handlers and motormen and conductors of the Cincinnati & Dayton Traction Company, Hamilton, Ohio, have accepted a decrease in wages after the matter had been referred to arbitration. Affecting approximately 150 employees the reduction makes a decrease of 5 cents an hour in wages of freight helpers and of 3 cents for motormen and conductors. Although the trainmen demanded 80 cents an hour, where they were receiving 51 cents, arbitration resulted in trainmen being offered 48 cents and freight helpers 40 cents an hour, commencing on June 1.

Program of Meeting

C. E. R. A. Summer Meeting

The tentative program for the summer meeting of the Central Electric Railway Association, which is to be held on board the S.S. *South American* en route from Toledo to Chicago by way of Lake Huron, St. Mary's River, the "Soo" Locks, Mackinac Island, Lake Michigan, Green Bay, Sturgeon Bay and Benton Harbor, has been drawn up by the program committee, of which Sam W. Greenland, Fort Wayne, is chairman.

Two formal sessions have been arranged, one on Wednesday morning, June 29, and one on Thursday afternoon, June 30. The subject that will be treated on Wednesday morning is "Automatic Substations," led by a paper by C. A. Butcher, Westinghouse Electric & Manufacturing Company. As there has been a feeling on the part of a number of the electrical engineers that there has not been opportunity at any meeting to give this subject the full discussion warranted, and as this subject is now up for very keen study in many cities and on many interurban lines, the committee has planned that ample time shall be given for a full discussion. Several written discussions will be presented by men particularly able and experienced in this study and several other electrical engineers are taking the trip expressly to hear this discussion and to take part in it.

On Thursday afternoon the theme is to be "Merchandising Transportation." This subject will be led off by the report of the Committee on Education and Training of Employees, of which James P. Barnes, Louisville, is chairman. Mr. Barnes has been giving the training of employees, particularly that phase of the subject looking to their functioning as salesmen for the company, a great deal of study, and it is expected that he will have some very worth-while thoughts to express to the association.

Arrangements are being made for running several special cars from various points in Indiana and Ohio to Toledo or Chicago, where the members will embark on the cruise. As a great many of the members desire to make the entire trip from Chicago to Toledo and return, leaving Chicago Sunday morning, June 26, at 8:30 a.m., it is expected that some of these special cars will be routed to Chicago. The committee on arrangements, for which John Benham, 15 South Throop Street, Chicago, is acting as secretary, reports that reservations from the railway men are coming in satisfactorily and that every effort is being put forth to furnish plenty of entertainment and to insure a highly successful meeting and trip. As the meeting of the association which voted to have a boat trip this summer was unanimously and enthusiastically for the boat trip and was unwilling to substitute anything else it is expected that there will be a large attendance.

Financial and Corporate

New Bedford Earnings Gain

Nearly 12 per Cent Return on Capital Stock from a Five-Cent Basic Fare

The annual statement of the Union Street Railway, New Bedford, Mass., shows a surplus of $92,630 after payment of 8 per cent dividends on capital stock for the year ended Dec. 31, 1920, as compared with a deficit of $28,435 the previous year. This is especially notable as the city lines are still being operated at a 5-cent fare. During the year, however, transfers were eliminated, and a traffic center in the heart of the city was established, beyond which a second 5-cent fare is charged. This company also operates a 14-mile suburban line between New Bedford and Fall River, on which a 25-cent fare is charged. The company owns and operates two summer amusement parks which it reports are self-supporting. According to the 1920 census, New Bedford has a population of 121,217.

INCOME STATEMENT—UNION STREET RAILWAY COMPANY

Year ended Dec. 31	1920	1919	Per Cent Change
Gross earnings from operation	$1,729,396	$1,439,769	20.12
Operating expenses	1,303,582	1,123,851	15.97
Net operating revenue	$425,814	$315,918	34.80
Non-operating income	3,570	1,090	227.00
Gross income	$429,384	$317,008	35.4
Deductions from gross income:			
Interest on funded debt	$11,250	$11,250	....
Interest on unfunded debt	16,510	16,076	$2.70
Taxes	113,994	123,118	*7.41*
Total deductions	$141,754	$150,444	5.77
Net corporate income	$287,630	$166,564	72.80
Dividends, 8% on $2,437,500 capital stock	195,000	195,000	....
Surplus for the year	92,630	*28,436*	....
Surplus end of preceding year	322,314	402,782	....
Adjustments of losses and depreciation	*2,511*	*52,032*	*95.2*
Surplus end of current year	$412,433	$322,314	28.0

STATISTICAL INFORMATION—UNION STREET RAILWAY COMPANY

	1920	1919	Per Cent Increase
Number of revenue passengers carried	31,730,868	27,354,946	16.03
Number of revenue passengers per mile of main track	755,496	592,552	27.50
Passenger car-miles run	3,046,484	3,015,824	1.02
Number of employees as of Dec. 31	514	480	7.08

Italics indicate deficit or decrease.

Fixed Charges Earned by Beaver Valley Line

According to the annual report of the Philadelphia Company two of its subsidiary traction properties, the Beaver Valley Traction Company and the Pittsburg & Beaver Valley Street Railway, were operated very successfully during the year, and at a time most difficult to formulate and carry out a new policy.

During the year, the report says, a new 5-cent zone fare system was established with the zones located to take care of the short haul travel within the various boroughs. The unusual condition of high labor cost and high material cost which prevailed was offset to a large degree by the thorough co-operation of the cities, towns and municipalities along the line (particularly by the chambers of commerce and boards of trade at these places), together with the active and earnest consideration of the employees. With such co-operation it was possible so to operate the properties as to serve the people better and earn fixed charges.

Much, however, has yet to be done to give better car service to meet the demand for transportation in this rapidly growing industrial community, and it is expected that with the continued co-operation of employees and the public-spirited citizens it will be posssible to improve the service constantly, so that within a reasonable time every proper demand for these facilities can be met.

Gross earnings for the calendar year were $705,242, an increase of $114,136, or 19 per cent more than those for the previous year, while the net income of $3,189, together with certain credit adjustments, enabled the deficit, which at the commencement of the year amounted to $342,243, to be decreased by $16,222. The car mileage operated during the year was 1,544,335, an increase of 21,583 miles, or 1.4 per cent over the previous year.

Five new safety cars for one-man operation were purchased during the year and have proved satisfactory in every respect. Thirty per cent of the price was paid upon delivery, and the remainder will be paid from earnings. It is expected further to increase the number of such cars in service so that a more frequent service can be provided. This increase in service, it is hoped, will be reflected in the earnings.

Wider Securities Market

Representatives of N. E. L. A. and Members of Chicago Stock Exchange Discuss Plan

At a conference between representatives of the National Electric Light Association and members of the Chicago Stock Exchange in Chicago on June 2, at the time of the annual convention of the N. E. L. A., plans were discussed for establishing a wide market in Chicago for public utility securities. The plan would be to list on the Chicago market all of the leading utility securities of the country, give publicity to utility companies and create a broad market for the securities of these companies. It was pointed out that while there are $21,000,000,000 of these securities in the hands of the public there is an open market now for only a small portion of such issues.

Samuel Insull, president Commonwealth Edison Company and other utilities, said:

> There can never be a real market in utility securities until we have a free and open market. Take the Commonwealth Edison Company. Its various issues are listed, and its securities have never been more easily salable. I am a very strong believer in the public having the full light of day shed on any of the affairs of the utilities with which I am affiliated, and that comes when the securities are listed. I believe it would do the utility industry good. Chicago is the natural place for such a market and I welcome any interest bringing its securities to Chicago for sale.

It is the plan of the members of the Chicago Stock Exchange and the bankers to go ahead at once with the work of broadening the market for utility securities in the hope of making Chicago the great central market for utility securities just as Boston is for the coppers.

Suspension Suggested Pending Better Business

The North Carolina Public Service Company has thrown itself on the mercy of the State Corporation Commission with respect to the future operation of its lines in Concord. The lines there consist of 3 miles of track and 3 cars. An 8-cent fare is charged. The population served is less than 10,000.

The plant with all equipment is valued at $123,000. Last year the company spent $1,800 in actually running the cars, and $5,000 more on paving required in the franchise. Business is still falling off with the idleness of many of the cotton mills, and the owners of the property seek the advice of the commission with respect to the future of the road.

Ten-cent fares were suggested as a remedy, but neither the commission nor the municipal authorities thought that 2 cents added to present rates would materially increase the gross income. It was suggested that the line suspend temporarily business in the hope of better conditions, but this plan was not generally acceptable. No further suggestion was offered, and the commission took the matter under advisement.

Answers to Accounting Questions

Another Series of Questions and Tentative Answers Under the Uniform System of Accounts for Electric Railways

Another series of tentative answers to questions raised in connection with the uniform system of accounts, prescribed by the Interstate Commerce Commission, has just been issued. As these answers have not received the formal approval of the commission, however, it should be understood that the decisions do not represent its final conclusions and that they are subject to such revision as may be thought proper before final promulgation in the accounting bulletins of the commission.

THE case numbers covered below are from A-565 to A-587, with certain omissions. Other installments will follow. The omitted numbers represent cases which either are not of sufficient importance to justify publication or involve questions upon which a definite conclusion has not been reached.

Q. (*A*-565). To what account should be charged the pay and expenses of a detective employed to recover stolen feed wire and to apprehend the thieves?

A. To account 23, "Miscellaneous electric line expenses."

Q. (*A*-566). To what account should be charged the excess of liabilities over assets acquired in connection with the purchase of a road?

A. The excess shall be considered as part of the purchase price and charged to account 527, "Cost of road purchased," from which it shall be cleared to the appropriate primary accounts as provided in the text of that account.

Q. (*A*-567). To what account should be charged the cost of water supplied to an automatic sprinkler system in car barns?

A To account 24, "Buildings, fixtures and grounds."

Q. (*A*-568). A carrier's coal crane is occasionally used by others for unloading their material. To what account should be credited amounts received for such use?

A. To account 117, "Rent of buildings and other property."

Q. (*A*-570). To what account should be charged the pay of a watchman at a power plant, the operation of which has been suspended?

A. To account 52, "Power plant employees."

Q. (*A*-571). A carrier pays dues of its officers and other employees in various clubs, business organizations, and associations. What should be the accounting?

A. Dues of traffic associations are chargeable to account 82, "Miscellaneous traffic expenses." Dues of other railway associations are chargeable to account 89, "Miscellaneous general expenses." Dues paid to other organizations for employees not in connection with the general management of the company shall be charged to the accounts to which their pay is charged.

Q. (*A*-572). The tax on income of a given year is not payable until the succeeding year. In the accounts of which year should the charge be made?

A. The tax is chargeable and should be set up by accruals in the accounts of the year in which the income accrues.

Q. (*A*-573). To what account should be charged the loss, other than depreciation, on a passenger car converted to a service car?

A. Loss assignable to the period subsequent to July 1, 1914, shall be charged to account 41, "Equipment retired," and loss assignable to the period prior to that date shall be charged to profit and loss account 315, "Loss on road and equipment retired." (See Cases 183 and 315, Accounting Bulletin 14.)

Q. (*A*-575). A carrier acquires an option on a piece of property, the consideration for the option being an immediate partial payment and payment of interest on the remaining amount of the agreed purchase price. What is the correct accounting?

A. The amount paid for the option, together with the interest accrued, shall be charged to account 420, "Other unadjusted debits," and carried therein for the period the option is pending. No entry shall be made during that period for the full cost of the property to which the option pertains. If purchase is consummated the amounts charged to account 420 shall be transferred to the appropriate asset account. If purchase is abandoned the amount in suspense shall be charged to account 317, "Miscellaneous debits."

Q. (*A*-577). A carrier's operations of miscellaneous physical property show in some months a net income and in other months a net loss. What is the proper method of using accounts 205, "Net income from miscellaneous physical property," and 219, "Net loss on miscellaneous physical property," in connection with these operations?

A. Ledger accounts may be set up to show separately the revenues and expenses of the operations, and when periodical or annual income statements are made the net balance of the two accounts shall be assigned to account 205 or to 219, as may be appropriate.

Q. (*A*-578). To what account should be charged the net loss sustained on account of the destruction of foreign freight cars in the carrier's revenue service?

A. To account 31, "Freight, express and mail cars."

Q. (*A*-579). A carrier has installed coasting clocks—devices attached to cars for registering operation without power. What accounts should be charged with maintenance costs, supplies for operations and pay of clerks recording the results?

A. The cost of repairs and renewals is chargeable to account 33, "Electric equipment of cars"; the cost of motormen's keys to account 67, "Miscellaneous car service expenses"; and the cost of tape and ribbons for clock records to account 94, "Stationery and printing." Pay of clerks engaged on clock records, if employed in the general office, is chargeable to account 84, "Salaries and expenses of general office clerks," or to account 63, "Superintendence of transportation," if employed in other offices.

Q. (*A*-580). What disposition should be made of loss in connection with the retirement of property the cost of which is classable in accounts 536, "Shop equipment," 537, "Furniture," and 538, "Miscellaneous equipment?"

A. These accounts are grouped under general account II, "Equipment," and the retirement of property charged thereto shall be in accordance with the rules prescribed for the retirement of property chargeable to accounts 530 to 535, inclusive, as shown at the top of page 102 of the Uniform System of Accounts. The difference between the original cost of equipment and the salvage recovered shall be prorated on the basis of the life in service prior and subsequent to July 1, 1914, and the difference between the amount thus determined to be applicable to the period prior to July 1, 1914, and the amount of depreciation for such prior period for which accounting has been made, shall be adjusted through profit and loss account 315, "Loss on road and equipment retired." The difference between the amount determined to be applicable to the period subsequent to July 1, 1914, and the amount of depreciation which had been accrued for such period shall be adjusted through operating expense account 41, "Equipment retired."

Q. (*A*-583). A carrier purchases the power it uses and incidentally sells small quantities of the current purchased. To what account should the amount received from the sale of current be credited?

A. To revenue account 118, "Power."

Q. (*A*-584). To what account should be charged war taxes paid on transportation charges for material and supplies?

A. War taxes, when assumed as such, on express charges or on foreign line freight charges on company material shall be charged to account 215, "Taxes assignable to railway operations," except that these taxes when in connection with road and equipment projects, if assignable, shall be charged to account 549, "Taxes," in accordance with Note C to account 215. (See Cases 589 and 598 (a).)

Q. (*A*-586). What accounts should be charged with a bonus paid to all employees?

A. The amount of such bonuses shall be included in the same accounts as the wages or salaries of the employees to whom the bonuses are paid.

Q. (*A*-587). To what account should be charged the cost of compiling lists of employees subject to income tax, to be rendered to the Federal government?

A. The pay of clerks engaged on the work is chargeable to account 84, "Salaries and expenses of general office clerks." The cost of stationary supplies used is chargeable to account 94, "Stationery and printing." (See Case 80, Accounting Bulletin 14.)

$650,000 for Needed Improvements

Directors of the Cincinnati (Ohio) Street Railway have approved the plan to lend their credit to the extent of $650,000 to the Cincinnati (Ohio) Traction Company to enable the latter company, which leases the Cincinnati Street Railway, to make needed improvements.

The Cincinnati Street Railway has increased its directorate by electing Judge Rufus E. Smith and Charles F. Windisch members of the board. This makes a total of eight on the board. Samuel Assur was elected second vice-president, while Bayard Kilgour remains as president. Looking toward the early solution of the traction problem a committee composed of Judge Smith, C. W. Dupuis and Robert A. Taft, all members of the board of directors, was named to make special investigation of the traction situation.

This committee with the addition of the new members of the board and the appointment of Mr. Assur as vice-president are in line with the new policy to take an active interest in the developments of the railway situation in Cincinnati.

$15,500,000 Increase in Authorized Stock at Milwaukee

Holders of more than two-thirds of the outstanding stock of the Milwaukee Electric Railway & Light Company voted on May 25 to amend the articles of incorporation to provide for an increase of $15,500,000 in the company's authorized capital stock and to increase the number of directors from nine to twelve. The dividends on the $4,500,000 of 6 per cent non-cumulative preferred stock now outstanding will be cumulative from and after Jan. 31, 1921.

The authorized stock as increased will consist of $4,500,000 of 6 per cent preferred stock, $15,500,000 of preferred stock, issue of 1921, and $20,000,000 of common stock. There has previously been outstanding $4,500,000 of 6 per cent preferred stock and $9,850,000 of common stock. The new preferred stock will be cumulative at not more than 8 per cent and redeemable at not less than par nor more than 110 as fixed by the directors. It will share ratably with the present preferred stock in the rights to cumulative dividends and in the preference over the common stock in liquidation, but will be non-voting except in the event of default of dividends, differing in that respect from the existing 6 per cent preferred stock, which now has and will retain full voting rights.

Additional financing is proposed through the issue of new preferred stock. It is planned to sell $3,000,000 of the new preferred stock, issue of 1921, bearing dividends at 8 per cent and redeemable at $103 per share, to enable the company to obtain funds to retire floating debt incurred for extensions and to permit the company to invest in additional facilities required to furnish the necessary service in various communities.

At a subsequent meeting held on May 28 the following were added to the board: S. B. Way, vice-president and general manager of the company; Edwin Gruhl, vice-president of the company and of the North American Company, and F. L. Dame, New York.

City's Attitude Governs Reorganization Prospects

The annual report of the Philadelphia Company for the year ended Dec. 31, 1920, makes the following comments on the Pittsburgh situation:

> The Pittsburgh Railways remained in the hands of the courts and receivers throughout the year. They made considerable progress in rehabilitating tracks and equipment from earnings, but failed to pay all fixed charges that accrued, and the Philadelphia company was called upon to pay interest due on some of the guaranteed bonds.
>
> The petition of the Philadelphia Company to have returned to its treasury $495,000 which had been advanced the previous year for bond interest is still in the hands of the court. The same condition prevails as to some of the claims of the city of Pittsburgh.
>
> The receivers have clearly demonstrated that some form of financing for new money with which to rehabilitate the property must take place before any marked improvement can be shown in the betterment of the property and the service to the public, as sufficient money for this purpose cannot accrue through earnings. The receivers also report the necessity for immediately adding 150 new cars to the equipment. More than five years have now passed since any new cars were placed in service.

It is recited that some progress has been made toward reorganization, but the opinion is expressed that before a successful reorganization of the properties can take place a definite attitude toward the railway will have to be assumed by the city officials and officers of the municipalities served. This is necessary in order to establish a transportation system which will give adequate service to the public. Because of the physical condition of the properties the problem of successful rehabilitation is a difficult one.

Merger Differences Irreconcilable

Despite the fact that at one time the prospects appeared to be bright for reaching a basis of understanding upon which the Washington Railway & Electric Company and the Capitol Traction Company might be induced voluntarily to merge, all hope of such merger at this time appears now to have vanished. In fact the local Public Utilities Commission, before which possible details were discussed, has issued a statement to the effect that the differences between the companies "are so great as to be irreconcilable."

It is said now that the only remaining possibility for a union of the two railways rests with the committees of Congress. Even this, however, appears very remote, for the Washington *Post*, which has been following the negotiations at much length in its columns, says that "even there the drafting of legislation on the subject probably will prove as difficult a job as that faced by the commissioners in attempting to get the companies to unite voluntarily."

Interurban Saved from the Scrap Heap

Application has been made to the Public Service Commission by the reorganized Buffalo & Depew Railway, Buffalo, N. Y., for permission to operate the interurban line between Genesee Street at the city line of Buffalo to Cheektowaga, Depew and Lancaster. The new company which has taken over the line from the receiver is the Depew & Lancaster Railway Corporation. It is capitalized at $200,000. The purchase price was $6,250 plus taxes due to various towns and villages, aggregating about $40,000.

Action on the petition has been deferred temporarily. The commission's experts will first report their findings in an examination of the physical properties and approval also must be given for the sale of the line.

John J. Lenahan & Son, 53-61 Fulton Street, Buffalo, bid in the property. Instead of junking the road as was the original intention, Mr. Lenahan and his associates will rehabilitate the line and operate it in competition with the International Railway - Buffalo - Depew-Lancaster division.

It is reported the villages and towns along the line have agreed to waive the back taxes in return for an agreement from the new company to operate the railway for a period of at least three years.

Interstate Road Sold at Foreclosure

The property of the Northampton Traction Company, running between Easton, Pa., and Phillipsburg, N. J., has been sold for $430,000 to C. S. Newhall, Philadelphia, chairman of the bondholders' protective committee. Mr. Newhall also purchased the right, title and interest of the company in $100,000 of second mortgage bonds; $44,000 of first mortgage bonds; $81,500 of third mortgage bonds, all of which were deposited by the Northampton Traction Company as collateral security under a mortgage given by the Northampton, Easton & Washington Traction Company to the Bankers' Trust Company, New York, as trustee; $130,000 of second mortgage bonds of the Bangor & Portland Traction Company deposited as collateral security under agreement made with the Easton (Pa.) Trust Company, as trustee; $23,000 of bonds issued by the company under a fourth mortgage and pledged as collateral for the payment of certain loans due various banks; 2,600 shares of the capital stock of the Bangor & Portland Traction Company and 10,793 shares of the Northampton, Easton & Washington Traction Company.

Interurban Sold Under Foreclosure.—The Philadelphia & Eastern Electric Railway, operating between Doylestown and Easton, Pa., has been sold under the hammer for $200,000 to John E. Snyder, Lancaster, Pa., representing the bondholders. The line is approximately 34 miles long.

Commission Checking New Jersey Valuation Figures

The Board of Public Utility Commissions of New Jersey is now engaged in going over with its engineers records and other data used as a basis by Ford, Bacon & Davis in reaching their findings with respect to the valuation of the property of the Public Service Railway and the Trenton & Mercer County Traction Corporation. The board had previously ruled that without information of this kind it could not provide an opportunity for cross-examination on the appraisal.

The valuation by Ford, Bacon & Davis, made at an expense of $100,000 to the State, was started under a special legislative act which provided that the findings of the engineers selected by the special valuation commission which the act created should be accepted by the Public Service Commission without review as a basis for fixing rates. While the valuation was in progress, however, the act was amended by the new legislature to require the acceptance of the valuation by the Utility Commissioners only as presumptive evidence.

In consequence of this change the utility commissioners at recent public hearings called upon the engineers for the original documents upon which they based their findings as to values. At these hearings it was brought out that among other information upon which the engineers had drawn for their guidance was the appraisal of the Public Service Railway as made for that company by Dean Mortimer N. Cooley. Other hearings will be held after the engineers for the commission have had an opportunity to check unit figures used by the valuation engineers with those found by the engineers of the commission for certain property accounts.

Financial News Notes

Rails Will Be Taken Up.—The Fresno (Cal.) Interurban Railway is planning to dismantle its line. Automobile competition has made the operation of the electric railway practically impossible.

Receiver for Subsidiary.—Patrick A. Barry, Mt. Vernon, Ohio, has been appointed receiver of the Columbus, Newark & Zanesville Electric Railway, Springfield, Ohio, controlled by the Ohio Electric Railway, already in the hands of receivers. The appointment was made on the application of the Girard Trust Company, Philadelphia, which charges default of the railway in the payment of interest on $1,211,000 of twenty-year bonds issued in 1906. The trust company asks that the mortgage be foreclosed, the railway property sold and proceeds applied to the payment of the bonds.

Texas Property Sold.—The property of the Corpus Christi Railway & Light Company, Corpus Christi, Tex., was sold at public auction on May 27 by R. U. Culberson, receiver. The railway and the lighting plant were first offered jointly, but as there were no bidders the auctioneer separated the two and offered the railway first. This was purchased by Claud Pollard, Houston, acting in his own behalf, on a bid of $500. Mr. Pollard said the purchase is made preparatory to scrapping the line unless local men are willing to raise money to guarantee operation without loss or will lease the line and operate it themselves.

Railway Property to Be Sold.—The property of the United Traction & Electric Company, Providence, R. I., will be sold under a decree of foreclosure in Providence on June 24. It is believed that the property will be bought in for the United States Electric Railways, the successor company. This latter company recently petitioned the Public Utilities Commission for permission to issue about $21,000,000 in stocks and bonds. The commission will consider the proposition at a public hearing on June 14.

Power Plant Sold to Light Company.—Following approval of the Railroad Commission of California the San Diego Consolidated Gas & Electric Company has issued and sold to H. M. Byllesby & Company, Harris Trust & Savings Bank, and Blyth, Witter & Company an issue of $2,750,000 of first and refunding mortgage 6 per cent gold bonds, due March 1, 1939. Proceeds of the issue will provide needed improvements and extensions to the company's present gas and electric generating equipment, transmission and service facilities. A part of the improvement program provides for the purchase of the power house of the San Diego Electric Railway with 8,200 kw. of installed capacity and for the enlargement and improvement of this station.

Accumulated Deficit $163,688.—The gross revenue of the Memphis (Tenn.) Street Railway in April, 1921, was only $266,729, as compared with $271,156 in April, 1920, when the company was operating on a 6-cent fare. The number of revenue passengers decreased from 4,484,919 to 3,836,639. Although the wage scale now in effect is much higher than that in force a year ago, L. LeMay, secretary-treasurer of the company, says that the operating expense during the month just ended was only slightly in excess of that of April, 1920. The cost of coal and other supplies and equipment is much lower than during the same period last year. The April deficit was $8,067. This brings the total deficit in the fare index fund from July, 1920, to May 1, 1921, to $163,688.

Additional Issue Authorized. — The Transit Commission of New York recently issued an order permitting Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, to issue an additional $3,000,000 in receiver's certificates. An extension of time was also allowed on $15,000,000 receiver's certificates from Aug. 1 to Feb. 1 next. Judge Mayer in the United States District Court signed the decree for maturity extension and in his decison reviewed the improvements undertaken by the company through the aid of receiver's certificates. Since August, 1919, he pointed out that 300 subway cars had been built, the reconstruction work on the Brighton Line between Church Avenue and Malbone Street had been completed and various terminals and power houses have been finished.

City Buys Trolley Liens.—New York City, through the Collector of Assessments and Arrears, recently bought at public sale franchise-tax liens on nineteen lines of the New York Railways and the Third Avenue Railway with a face value of $1,628.508. The railways still have three years to redeem the franchise by tax payments with interest. Protests were made against the sale. Among them was one from Job E. Hedges, receiver of the New York Railways, who contended that the taxes demanded exceeded those justly due. What disposition the city will make of the liens has not been disclosed.

Columbus Bonds Offered. — Stockholders of the Columbus Railway, Power & Light Company, Columbus, Ohio, have authorized the issuance of $2,700,000 in 5 per cent first refunding and extension bonds for the purpose of retiring a similar amount of general mortgage bonds bearing 6 per cent interest, issued in June, 1920. At that time, also, the company was authorized to issue $2,500,000 in refunding and extension bonds, which with the new issue brings the total of such bonds to $5,200,000. The new issue had been authorized by the State Public Utilities Commission a few days before. The stockholders voted to accept the offer of Harris, Forbes & Company, New York, N. Y. The bonds have since been offered for subscription.

$4,180,000 of Acquisition Bonds Authorized.—On May 24 the Western Pacific Railroad was authorized by the Interstate Commerce Commission to issue and sell at not less than 85 per cent of par $4,180,000 of first mortgage gold bonds to acquire the Sacramento Northern Railroad, an interurban electric railway in the vicinity of Sacramento, Cal. The Western Pacific also proposes in event of acquisition to construct certain extensions to the property at an estimated cost of $3,000,000, and is expected to apply to the commission within sixty days for authority to issue $3,000,000 of its first mortgage bonds for that purpose. Although authority was granted for issuance of the bonds for the declared purpose of acquiring the properties the commission made clear it had not finally passed on the question of acquisition. "The merits of such acquisition are not now in issue," the announcement said, "and we express no opinion on that question." A further hearing is to be held.

Traffic and Transportation

Readjustment in Dubuque—Lower Fares, Lower Wages

In view of the great reduction in patronage during the last six months on the lines of the Dubuque (Ia.) Electric Company, the management has found it necessary to cut the wages of its employees as the only possible way of reducing operating expenses. On May 4 the following modifications in rates of pay in cents per hour went into effect in the platform wage scale:

	New	Old
First six months	35	38
Next six months	38	44
Second year	41	50
Third year and thereafter	45	60

A copy of the bulletin listing the changes was posted at the carhouse and was also given to each employee individually. The day previous to the posting of the bulletin the notice was submitted to the Mayor, the City Manager and Aldermen, at whose instance a lower ticket rate was placed in effect for a trial period as another readjustment measure. The rate was changed from seven tickets for 50 cents to four tickets for 25 cents—the cash fare of 8 cents remaining the same.

In its statement the company said that it was unfortunate that the great bulk of the expense carried was represented by wages and that any material reduction in expenses could not be accomplished without a reduction in wages. Moreover, the company contended that it was extremely questionable whether revenues would be proportionately increased if the fare were higher, because riding, already at a low ebb, might be still further discouraged.

Reduced Fare Authorized—Rerouting Plans Under Way

The Indiana Public Service Commission has formally issued the order authorizing the Indianapolis (Ind.) Street Railway to return to the straight 5-cent fare with a 2-cent transfer. The likelihood of this ruling was referred to in the ELECTRIC RAILWAY JOURNAL for June 4. The new fare takes the place of a 6-cent cash fare, twenty tickets for $1, together with a 1-cent transfer. The lower fares will be tried out in the hope of reducing jitney bus competition, which has greatly affected the receipts of the railway.

Rerouting the line of the railway, which was one of the conditions upon which the Public Service Commission ordered a return to the 5-cent fare, will be effected gradually one line at a time. David E. Matthews, chief railroad inspector of the commission, has been placed in charge of the rerouting. He will meet with the City Council soon to consider the first change in routes. The rerouting is to be done in an effort to enable the company to check the inroads of the jitney bus. During the period until Aug. 1, while the rerouting plans are being worked out, the 5-cent fare and 2-cent transfer charge will be effective.

Officials of the railway have indicated that they will co-operate to the fullest extent with state and city officials in revising the routes to improve service. In addition to the rerouting of cars the commission will take up the question of the improvement of service during rush hours. In working out the rerouting plans the commission experts probably will consult with officials in other cities. It may even be found advisable, it is said, to call in engineers familiar with such problems to advise on the matters that arise.

Connecticut Roads Authorized to Run Buses

The Governor of Connecticut has affixed his signature to a bill authorizing electric railways to own and operate motor vehicles for hire. The text of the measure follows:

> *Sec.* 1. Any street railway company may acquire, own and operate motor vehicles running upon a regular route and carrying passengers between the termini or over any intermediate portion of such route at a regular stipulated individual or per capita fare. Any company which shall exercise the authority conferred by the provisions of this act shall be subject to the supervision and control of the Public Utilities Commission to the same extent and in the same manner as with respect to the business of transporting passengers and property by means of street railway cars.
>
> *Sec.* 2. This act shall take effect from its passage.

J. Moss Ives, receiver for the Danbury & Bethel Street Railway, announced in the Superior Court at Bridgeport on June 3 that his company would take advantage of the new law and try out the feasibility of operating buses in place of trolleys over portions of lines which have proved unprofitable.

City of New Orleans Asks for Further Evidence

The Commission Council of New Orleans, La., has made answer to Receiver O'Keefe of the New Orleans Railway & Light Company, in the injunction suit restraining the city from interfering with him in the collection of an 8-cent fare. It is alleged by the city that no proof has been tendered by the receiver that subsidiary corporations of the railways are bound by agreements under the parent concern and in the alternative the court is asked to compel the receiver to produce all contracts, agreements and leases between the railway and the subsidiaries. It is further alleged that the company has not been operated efficiently and economically.

Jitney Regulation Bill Vetoed in Wisconsin

Governor John J. Blaine of Wisconsin has vetoed the so-called Perry jitney bill. This measure would have placed all motor buses and jitneys operating in the state under the jurisdiction of the Wisconsin Railroad Commission and would, as it is claimed, have virtually put the motor bus lines in the state out of business. In his message explaining the veto Governor Blaine stated that his objection to the bill was that it undertook to regulate in a field "where free competition serves the public welfare best."

The Governor pointed out that the law as it now stands requires motor vehicles to furnish adequate service at reasonable rates. He is reported in part as follows:

> My objection to this bill is fundamental. Jitneys and buses may be operated by anyone, and, therefore, there is no opportunity to create a monopoly. It is quite different with respect to a street railway, an interurban railway, or a railroad. There is a limitation on the number of such roads that may occupy the field for transportation.
>
> Wisconsin has spent $42,000,000 on highways in the last ten years, and the people were led to believe that they would receive returns from such investment in better transportation, greater convenience, and in economy of service. The motor vehicles have come to stay; they are the beginning of a transportation system about which it is dangerous to prophesy. My objection, therefore, to this bill is that it undertakes to regulate in a field where free competition serves the public welfare best.

Mayor Seeks Reduction of Fares in Detroit

Action has been started by Mayor Couzens of Detroit, Mich., with a view to bringing about a reduction of fare on the city lines of the Detroit United Railway and having the company cash the rebate slips issued with tickets purchased during the past year. In a letter addressed to Allen F. Edwards, acting president of the Detroit United Railway, the Mayor asks that a conference be arranged for an early date to consider the matter of reducing the fare to 5 cents. Another letter was addressed by the Mayor to the Corporation Counsel asking him to arrange a conference with the company's attorneys regarding the refund of money by the company.

The basis for his action, according to the Mayor, is the fact that the audit of the company's books for the city indicates that the increased revenue resulting from the increase in fares from 5 cents to 6 cents cash, or nine tickets for 50 cents, has exceeded by more than $507,523 the amount used to offset the increase in wages granted to the railway employees.

In the letter to Mr. Edwards the Mayor cites the fact that practically a year has elapsed since the company was granted an increase in rate for the purpose of paying increased wages to the platform men and he states that in view of the fact that on May 1 the wages were reduced to the point where they were prior to last June, consideration should be given to the matter of reducing fares to the rate existing prior to June 9, 1920.

Six Cents in Los Angeles

Return of 7.4 Per Cent Allowed on Rate Base of $26,198,365—Zone Fare Opposed

Under the order of the Railroad Commission of California issued on June 1 the 5-cent fare is continued for Los Angeles. The "nickel" fare, however, is not for the casual rider. It is only for purchasers of ten rides. As indicated in the ELECTRIC RAILWAY JOURNAL for June 4, page 1058, the fare on the Los Angeles Railway will be 6 cents for those who do not buy "tokens" or tickets. Tokens or tickets are transferable. They are to be sold on the cars and at the company's offices.

$2,600,000 FOR BETTERMENTS

The service improvements contemplated by the commission require the purchase by the company of 132 additional cars to cost $1,400,000, construction of additional carhouses, shops and substations, and the making of other improvements to cost $2,600,000.

The company is ordered to establish a depreciation fund and $720,000 a year in monthly installments of $60,000 and is asked to enter into negotiations with the city of Los Angeles for the purpose of exchanging, on reasonable terms, its present limited franchises for an indeterminate re-settlement franchise covering all of the lines in operation within the city limits.

The order requires that monthly statements must be submitted by the company to the commission to show how the order of the commission has been carried out.

In discussing the zone system the commission said:

> It is apparent that there is a very widespread opposition to zone fares within the present 5-cent fare limits, and it is also true that there would be serious difficulties in fare collection if a zone system were adopted. In view of the conditions existing in Los Angeles, we are inclined to believe that zoning of the city should not be undertaken without further careful study and only as a last and inevitable remedy.

As to imposing a charge for transfers the commission said:

> We are satisfied such a charge would result in an unjustifiable discrimination between different users of the street railway and the discrimination would be particularly obnoxious under the peculiar conditions obtaining in Los Angeles, where a large percentage of transfer passengers are short-haul riders. There would also result from a transfer charge a discrimination between various business localities in the downtown district.

DECLINING COSTS A FACTOR

The commission declares that it is apparent that the company is not entitled to the full amount of additional revenue that would be produced by a flat increase to a 6-cent fare and that no burden should be placed on patrons unless entirely necessary and justified.

The company is allowed a return of 7.4 per cent on a rate base of $26,198,365. On this the commission said:

> In a time of declining costs and prices (having in mind the unavoidable uncertainties in estimates of this nature) it may confidently be expected that applicant will earn, under the rates suggested, and under economical and efficient management a full measure of the contemplated fair return. With the income from the rates fixed in this decision, the applicant will be in a position, we believe, to secure the necessary capital for new equipment, betterments, and extensions, and the commission will expect the betterment program be carried out.

Change in Ticket Rate.—Reductions of the ticket fare between Broad Ripple and Indianapolis was decided on by the Indiana Public Service Commission at a conference on May 4. The present rate for tickets is six for 50 cents. Under the new order ten tickets will be sold for 75 cents. The reduction in the ticket fare is slightly less than 1 cent on each ticket. Under the old rate one ticket cost 8⅓ cents, and under the new order the cost of one ticket will be 7½ cents. The cash fare of 10 cents between Broad Ripple and Indianapolis, with a 5-cent fare from Fifty-third Street, will remain unchanged under the modified order which will be issued by the commission. Notice of the change in ticket rates will be given to the public when the order is issued, officials of the commission said. The order establishing the present fares was approved by the commission on Dec. 17.

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170 Applications for Bus Permits

Hearings Being Held Before Connecticut Public Service Commission to Fix Status of Bus

A new campaign for supremacy between Connecticut electric railways and jitney buses has begun with the series of hearings before the Public Utilities Commission on the petitions of bus line owners, rural and interurban, for the most part, for license to operate in competition with the electric railways. The commission has received 170 applications for such certificates from various parts of the State. Its power of regulation in this matter was conferred upon it in a law passed by the present Legislature. The issue has become clearly defined and urgent as is indicated in the statement of Lucius S. Storrs, president of the Connecticut Company, while at Putnam that "either the competitive bus service must be entirely eliminated or the trolley service discontinued."

IN ADDITION to the hearing at Putnam on May 25, sessions were held at Hartford on May 24 and at New Britain on May 27. Other hearings were scheduled as follows: Middletown on June 2 on petitions concerning bus lines between Essex and Middletown, Saybrook-Middletown and Ivoryton-Middletown; at Enfield on June 2, Thompsonville-Agawam, Mass.; at New Haven on June 2. Derby-New Haven (four lines), Derby-Ansonia (two lines); at Hartford on June 1, Waterbury-Hartford.

Richard T. Higgins and Charles C. Elwell of the commission conducted the hearing at Putnam, attended by some 150 persons. President Storrs read a statement in part as follows:

> The Connecticut Company is amply able, to render a full measure of service to these communities, but it must be apparent to all that all public expenditures for transportation must come to the Connecticut Company.
>
> Up to the present time we have been temporizing with the matter, but now that the bus is a medium of transportation upon which the communities can depend as long as those individuals that operate the buses are financially able to continue, or do not become tired of the work, it is time for the Connecticut Company frankly to state its position.
>
> It is a matter of indifference to us as to whether or not we continue to operate the lines between Central Village and points north to Putnam, but the competitive bus service must be eliminated or the trolley service discontinued.
>
> There is no prospect of material profits to the railway even though it is left alone in the field but the company recognizes the obligation to perform public service and is willing again to render a full measure of service if free from competition.

Eight witnesses testified as to the indispensability of the buses. General J. W. Atwood, L. H. Fuller of the local chamber of commerce and other citizens spoke in favor of the trolleys.

Thomas J. McGreevy, assistant comptroller of the Connecticut Company, said that on the lines north of Central Village the operating expenses exceeded the receipts by $37,206 for the year ended April 30, 1921.

At the hearing in Hartford Mayor Newton C. Brainard said that the presence of large buses on the city streets was most objectionable. Consideration was being given a petition for the continuance of a jitney line between the Capital and South Manchester over a route served by the electric railway. There were prominent citizens present who said there was need of both trolley and jitney service and others were unqualifiedly in favor either of one or the other. Competition over the Manchester-Hartford line has been of the keenest.

Nathaniel J. Scott, manager of the Connecticut Company's Hartford division, presented a chart to show what service the company had been rendering prior to August, 1920, and at the present time. The reduction in service, he explained, had been due to the decrease in the number of passengers. A count of passengers on Hartford-bound cars recently showed a maximum of twenty-three and a minimum of three. The seating capacity is fifty-six.

"Trolley cars are essential but they can't accommodate the public," declared Mayor Curtis of New Britain at the hearing in that city. He said that the Connecticut Company had not furnished additional service as the demand for it arose at times in the past when there was no jitney competition. It was his opinion that the company would derive larger profits on a lower rate of fare.

In New Britain the buses are run over routes within the city in direct competition with the electric railway.

The Hartford case concerns only entrance to the city as a terminus to an interurban line.

The Aldermen of Bridgeport have gone on record as believing that the jitney buses are a public necessity and convenience in many parts of Bridgeport and that the present routes for jitney buses should be maintained. Suggestions for jitney bus regulations in Bridgeport also were outlined in a report adopted by the Aldermen.

Work Divided by Commission

Because of the large number of applications for certificates to operate jitney buses in the State, the Connecticut Public Utilities Commission has found it necessary to divide the work. During the past week Commissioner R. T. Higgins has conducted hearings in Thompsonville, C. C. Elwell in New Haven and J. W. Alsop in Middletown.

Before the entire commission on June 1 at the state Capitol petitions were considered from persons desiring to operate buses between Hartford and New Britain and Hartford and Waterbury. Residents of towns lying between these cities said that they saw no advantage in having the jitney service.

The New York, New Haven & Hartford Railroad objected to the issuing of the certificates because the jitney men in Hartford and Waterbury made their headquarters near the railway stations and thus diverted passengers away from the railroad. He also said that the railroad was running eight trains daily between the two cities and thus was furnishing adequate service. The fare on the railroad is $1.21. The buses charge $1.25.

The commission endeavored at a hearing in New Haven on June 2 to determine the present condition of the traffic over the various bus lines radiating from that city, more particularly the New Haven-Derby route. There are about forty cars operating on the line at present, thirteen large buses and twenty-seven touring cars. The buses run every half hour and the touring cars every ten minutes. The trolleys maintain a half hour schedule for a greater part of the day.

It was estimated that each bus earns about $7,000 a year, which with a fare of 20 cents means a passenger traffic of approximately 35,000 persons a bus a year.

$7,000 a Year Earned per Bus

The New Haven-Derby Bus Corporation was incorporated a few weeks ago with a capital stock of $50,000 by nine bus owners who intend to operate ten large buses having a seating capacity of from twelve to sixteen. According to the plans of the incorporators, beginning July 15 buses will run every half hour from 6 a.m. to 12:30 p.m., every 15 minutes from 12:30 to 6 p.m. and every half hour from 6 p.m. to 12 p.m. The time between New Haven and Derby is about 25 minutes.

The owners of the touring cars operated between the cities were represented by P. J. O'Sullivan, Derby. They have already planned an association and operate about twice as many cars as the bus corporation. The touring car fare is 25 cents, or 5 cents less than on the trolley.

Attorney George D. Watrous, general counsel for the Connecticut Company, questioned all the witnesses to show that the trolley can easily accommodate all the traffic. It was found on May 31 that from Derby to New Haven beginning at 5 a.m. and ending at 11 p.m. the trolleys carried 741 and the jitneys 601 passengers. Outbound from New Haven for the same period the trolleys totalled 865 and the buses 703, showing that out of a total of 2,910 passengers the buses carried 1,304, or nearly 45 per cent. Attorney Robert J. Woodruff, in behalf of the buses, brought up the question of the increases in fare which have been made by the trolley. It was finally agreed by representatives of both the trolley and the buses to furnish financial statements for those particular lines during definite similar periods.

Commission Reserves Decision

Commissioner Elwell, together with Mr. Wadhams and Mr. Rudd, heard the testimony. Mr. Elwell examined each of the witnesses.

On June 7 in New Haven the commission heard evidence with respect to bus service between New Haven and Wallingford.

Seventeen per Cent Wage Reduction in Youngstown

A new wage agreement has been entered into between the trainmen and the Pennsylvania-Ohio Electric Company, the Youngstown Municipal Railway and associated companies operating city and interurban lines at Youngstown, Warren and Niles, Ohio, and New Castle and Sharon, Pa. The new scale is 48 cents an hour for the first three months of employment, 51 cents an hour for the next nine months and 56 cents an hour after one year, with 5 cents additional on all classifications for operators of one-man safety cars.

This is a reduction of 12 cents an hour in each classification and of 17.6 per cent on the base rate. The old scale was 60 cents an hour for the first three months of employment, 63 cents an hour for the next nine months and 68 cents an hour after one year, with the 5-cent differential for operators of safety cars.

The old scale expired at midnight on May 31, at which time no agreement had been reached. Operations and negotiations continued and the agreement was reached on June 2 and was ratified by the trainmen by a vote of 348 to 106, about 85 per cent of the men voting. The new agreement continues in force till June 1, 1922. It provides for minor changes in working conditions and removes restrictions on the use of one-man safety cars.

On June 4 a new agreement also was reached by the same companies with their linemen, who had been on strike since May 1. The new wage scale for these men is on the same percentage of reduction as that of the trainmen. The old scale had been on the base rate of $1 an hour. This was reduced to 82½ cents an hour. The linemen had demanded the renewal of the old rate.

Kansas City Residents Hard to Pacify

Weekly adjustment of jitney routes by the city jitney inspector has become necessary at Kansas City, Mo., to meet objections from property owners and the constantly decreasing number of streets available for jitney use is raising a serious situation with respect to routing. It is not always possible to select a route on which jitney operation might be profitable. Citizens have prepared petitions to the Mayor, asking that jitneys be routed away from their streets; and in many cases the Mayor has responded to the petitions by ordering the routes changed. In some instances the City Council has passed ordinances requiring the changing of jitney routes.

In other cases routes have been shortened so that now they are short-haul and jitneys on such routes are finding competition with the railway difficult at the 10-cent rate. In consequence there is a prospect that jitney tickets on such routes may be sold at two for 15 cents.

The chief harassment of city officials is from home owners who point to the hazards to children of jitney operation on residence streets. Downtown the difficulty has not yet been adequately met of so routing jitneys as to avoid serious congestion of normal traffic in busy hours.

Jitneys were recently by ordinance ruled off streets on which the Kansas City Railway operates.

Would Make Operating Ordinance More Explicit

Objection on the ground that it is not sufficiently explicit was made by Mayor John Galvin of Cincinnati to an ordinance submitted by the Cincinnati (Ohio) Traction Company, providing for a decrease in fares. The principal provisions of the ordinance, which was submitted as an amendment to the present ordinance, are as follows:

That school children ten years old and over shall pay 5-cent fare.

That those less than ten years shall ride as minors on half fare.

That payment of the Cincinnati Street Railway franchise tax of $350,000 a year be deferred for 1920 and 1921 until after Jan. 1, 1922.

The proposed ordinance also provided that when fares exceed 7½ cents the company be not required to make any payment into its reserve fund. Under the present ordinance the reserve fund must reach $650,000 before fares can be reduced.

The city officials, after considering the ordinance, asked that it be redrawn to make it more explicit, particularly as to when fares will be reduced.

Bus Men Determined to Fight

A hearing was scheduled for June 7 in the Common Pleas Court at Toledo, Ohio, on the petition for a permanent injunction restraining the city from enforcing the bus regulatory ordinance, which was to have gone into effect on June 1. The court recently granted a temporary restraining order which permitted the buses to operate during the week. The city attorneys claim that the municipality has still the right to regulate any kind of traffic and that the buses do not own any privilege of the streets.

At a recent meeting of fifty-five bus owners and operators the bus men said they would not take out licenses and provide indemnity bonds but would stand arrest and prosecution.

Commissioner W. E. Cann, when the measure was proposed in Council, pointed out that the Community Traction Company pays approximately $300 a car annually in taxes, street cleaning, snow sweeping, pavement repairs, and other ways, for the privilege of operating. Buses, heretofore, have been charged a license fee of $1 merely for police regulation.

Stage Rules Laid Down

At the hearing held at Olympia, Wash., recently on the tentative set of rules and regulations laid down by the auto transportation section of the Department of Public Works, a number of new provisions was set down for the regulation of stage and auto freight lines. The most important ruling made was the announcement that the department would hold that taxi and jitney companies could not carry passengers over lines for which certificates of convenience and necessity had been issued to stage companies. Representatives of the Seattle Taxi Company immediately announced that this was undoubtedly a point to be settled in court.

Considerable objection was raised to one clause in the rule regarding the use of emergency cars, and this brought out the fact that no car will be allowed to operate on any of the stage lines of the State unless they protect passengers by the bonding of the car with a surety company. This provision will also apply to emergency cars. At first the ruling was so drawn that before an emergency car could be placed on a run, it would be necessary to telegraph the department at Olympia and get permission of the head of the stage department there. This, however, was amended so that a record will be kept of the use of emergency cars, and a fee charged therefor, but only bonded cars will be used.

Ten hours of driving was decided upon as the maximum length of time in which a stage driver should work in any twenty-four hours, and eight hours of consecutive sleep was determined on as necessary in every twenty-four hours to keep him fit properly to protect the public. The new rules became effective on June 1.

Transportation News Notes

Seven Cents in Sioux City. — The Sioux City (Ia.) Service Company was recently granted permission to charge a 7-cent fare under a temporary injunction which restrains the city from enforcing the ordinance providing for a 6-cent fare. Refund certificates good for 1 cent each are being issued in case final judgment is against a 7-cent fare. The City Council recently stated its unwillingness to countenance any wage cut affecting employees. The company accordingly brought court action.

Fare Suit Dismissed. — The suit of Reuben Ruthenberg, attorney, to enjoin the Louisville (Ky.) Railway from collecting more than 5 cents was dismissed by Judge Kirby recently because the same questions involved in Attorney Ruthenberg's suit are pending in the United States Circuit Court of Appeals. It was Attorney Ruthenberg's plea that he acted in the capacity of a private citizen, while in the other suit the municipality was concerned. Judge Kirby indicated that it was the rule in Kentucky that the court taking first jurisdiction in a case should carry it to a conclusion.

Fare Rate Excessive. — Examiner Witters recently filed a report with the Interstate Commerce Commission maintaining that the 10-cent fare charged by the Louisville & Northern Railway & Lighting Company, New Albany, Ind., was unreasonable. The line runs between Louisville and New Albany and up to Oct. 31, 1920, operated on a 7-cent fare. Shortly after the inception of the 10-cent rate the city of New Albany, the Chamber of Commerce and several associations filed a protest with the Interstate Commerce Commission asking for a hearing. This hearing took place on Feb. 17 of this year before Mr. Witters.

Rehearing in Fares Refused.—The Board of City Commissioners of Dallas, Tex., has refused the application of the Dallas Railway for a rehearing of its petition for authority to increase fares from 6 cents to 7 cents in Dallas. The refusal to grant the 7-cent fare was based on a report by J. W. Everman, supervisor of public utilities, in which it was shown that the earnings of the Dallas Railway during April showed a net return of 7.275 per cent on its invested capital, while the franchise provisions call for a net return of 7 per cent. It is also claimed that, eliminating the earnings of the Dallas Interurban Building, which is 4 per cent, the Dallas Railway would show net earnings of 78.93 per cent during April. The action of the application for rehearing had been delayed because of the death of J. F. Strickland, president of the company. The 6-cent fare granted the company for a period of one year will expire on June 25, and the city commission has made no intimation as to whether this fare will be continued for another year. It is believed, however, that such an extension will be granted. Action on the matter of resort to the Federal court will likely await the election of a successor to Mr. Strickland.

Fare Increase Authorized.—Determining that the Salem & Pennsgrove Traction Company, Pennsgrove, N. J., under its present operating revenue, will not be able to meet the interest on its funded debt or even the taxes which will become due, the Public Utilities Commission has allowed the company to increase from 7 to 8 cents the rate of fare in each of its five zones. The company's line extends from a point in the Borough of Pennsgrove through the townships of Upper Penns Neck and Lower Penns Neck, in Salem County, a distance of 14.25 miles. The company was formed and the road constructed in 1915 entirely with private capital. When it was constructed there was in operation a large industrial plant at Carney's Point for the manufacture of war munitions and the road was required for the transportation of employees. During 1916 and 1917 the road was operated at a profit on a 5-cent fare, but in February of last year the commission permitted the company to charge 7 cents. Since the cessation of the war the industrial plant laid off hundreds of hands and the road lost money. Residents of the communities using the railway favor the continuance of operations and no objection is expected to the increased rate.

Saltair Road Raises Fare.—The Salt Lake, Garfield and Western Railroad, Salt Lake City, Utah, has been granted permission to increase its one-way fare from Saltair beach to Salt Lake City, in a recent decision of the Public Utilities Commission of Utah. The decision grants permission to increase the one-way fares during the Saltair beach resort season from 25 to 35 cents and the one-way half fare excursion from Saltair to Salt Lake from 15 cents to 20 cents. The decision particularly affects motorists who go to the resort by auto and return on the train. When the round trip fare was increased to 35 cents last year a subfare was published providing for a 25-cent excursion fare from the beach to Salt Lake. The decision now makes the one-way fare the same as that charged for the round trip from the city. The company claimed that it had sustained a loss from operating the road between the beach and the city during 1920 which amounted to $37,000. The increase granted, it is estimated, will increase the revenues by $6,000 during this year, but the company will sustain a deficit, according to testimony given before the commission. The increase will be made effective on ten days' notice filed with the commission. The commutation tickets at present are sold in books of thirty for $7.50 and books of 100 for $20.

Personal Mention

Mr. Beall Texas Electric Railway's New Head

Jack Beall was elected president Texas Electric Railway by directors on June 7. Mr. Beall, who has been one of the attorneys for the interurban for six years, is a brother-in-law of the late Col. J. F. Strickland, former head of the railway. N. A. McMillan, St. Louis, was elected chairman of the board of directors, a position which has just been created.

Operators Advanced to Take Charge of New Department

W. R. Alberger, vice-president and general manager of the San Francisco-Oakland Terminal Railways, Oakland, Cal., has announced several important changes in the duties and responsibilities of various members of his official staff.

George H. Harris, for the past seven years general superintendent of the company, has been appointed assistant to the general manager. The position of general superintendent is abolished. A portrait of Mr. Harris and an outline of his career appeared in the JOURNAL for March 19 following his election as president of the Pacific Railway Club.

In line with the company's policy of keeping abreast or even ahead of modern business methods a new department has been created, the duties of which will be to make an intensive study of all costs and results obtained from various methods of maintenance and operation. This department, which is a decided innovation in public utility management, will secure and compile into comprehensive and graphic reports, definite and conclusive data regarding all activities of the company, not only as to costs of different types of constructions and equipment and their maintenance and operation, but also as to revenues derived from all sources. Such information will serve as a guide to the management in its efforts to furnish to the public proper and efficient service.

S. H. Pickard is appointed manager to head this newly created department, while J. W. Brom, for several years a member of the general manager's office staff, will be associated with Mr. Pickard in the new organization.

F. R. Lloyd has been appointed purchasing agent, the position left vacant by Mr. Pickard's promotion. Mr. Lloyd has been assistant purchasing agent since 1914, with the exception of two years when he served in the army in France during the recent war.

A department of personnel has also been organized to handle all employment for the company and to supervise all training of employees, as well as all personnel work which may be undertaken. John S. Mills, formerly claim agent and assistant superintendent, is at the head of this work.

New Post for Mr. Weber

Former Power and Equipment Engineer Takes Mr. Grauten's Place on Kansas City Railways

The appointment of R. L. Weber as electrical engineer of the Kansas City Railways, succeeding S. H. Grauten, has been announced by the receivers. Mr. Weber came to the railways company in 1914, as engineer of equipment and power for the Board of Control, the bi-partisan supervisory board created by the new railways' franchise of 1914.

During the war, Mr. Weber served in the cruiser and transport force of the Atlantic fleet with duty on the transports *St. Paul* and *Lenape* and on the cruiser *Albany*. On his relief from service in May, 1919, he resumed his connection with the Board of Control, in Kansas City.

R. L. WEBER

Prior to the war Mr. Weber had directed the design and construction of the last two series of double-truck cars which have established an especially satisfactory record. Since the war, the activities of his department have been centered on power house improvements, and under his direction several effective measures have been carried out.

Mr. Weber's change from engineer of the Board of Control to electrical engineer of the Kansas City Railways is, in a measure, incident to the realignment of departments under the receivership.

With his other duties, Mr. Weber has for some years handled the technical features of power negotiations and cases before the Public Service Commission, and his intimate connection with these matters and the importance of power negotiations, pending and anticipated, are stated to have influenced the new appointment.

Mr. Weber is a graduate of Cornell University in the class of 1905. He is a member of the national electrical, mechanical and naval engineering societies. Before coming to the railways company, he had an extensive experience in the power field, where for several years he acted in responsible capacities on the design and construction of steam and hydro-electric properties. His electric railway experience includes connections with the Lehigh Valley Transit Company, the Kansas City, Clay County & St. Joseph Railway, and the Ironwood & Bessemer Railway & Light Company.

Mr. Cady Goes to Utica as Claim Agent

Herbert E. Cady, who succeeds Joseph S. Kubu as claim agent for the New York State Railways at Utica, began his railway duties in 1903 as a conductor on the Syracuse city lines. After a few years as a conductor, part of which time he was employed on the Syracuse-Utica third-rail line, he was appointed to the claim department force as an investigator.

He served as an investigator from 1907 until last year, when he was made assistant to Ansel D. Brown, claim agent for the Syracuse branch of the New York State Railways. He was appointed to succeed Mr. Kubu on May 16, much to the delight of his many friends.

Mr. Cady is a native of Chicago, but at an early age moved to Geneva, N. Y.

Frank L. Smith, Dwight, Ill., took office on April 11 as chairman of the Illinois Public Utilities Commission. At the same time he announced the appointment of William H. Culver, a former Chicago newspaper man, as his secretary. Mr. Smith was the unsuccessful rival of William B. McKinley, president of the Illinois Traction System, in the election for United States Senator last fall.

B. J. Yungbluth, supervisor purchasing and supplies, Philadelphia Rapid Transit Company during the absence of G. A. DuCasse, who was temporarily assigned to other duties, on June 1 resumed his duties as a member of the co-ordinating staff. G. A. DuCasse, temporarily assigned to the staff of the vice-president of accounting and finance, has resumed his former duties as supervisor purchasing and supplies.

E. W. Lewis has resigned as assistant general manager of the Iowa Railway & Light Company, Cedar Rapids, Ia., and has entered the business field for himself, forming the firm of E. W. Lewis & Company, wholesalers of electrical supplies. He became connected with the Iowa Railway & Light Company as superintendent of transmission lines, and he also held other positions with that company before becoming assistant general manager, the office he has just resigned. He was formerly with the Westinghouse Electric & Manufacturing Company, first in East Pittsburgh, Pa., and later in Baltimore, Md.

C. C. Chappelle, who has been representing the eastern security holders of the New Orleans Railway & Light Company, New Orleans, La., in the negotiations with the city looking toward a settlement of the problems confronting the company, is well known in electric railway circles. He was at one time one of the three members of the executive committee of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo. From 1911 until 1914 he was vice-president and general manager of the Federal Light & Traction Company, New York. Previous to this and immediately after his graduation from Purdue University in 1895 most of Mr. Chappelle's associations were with the Westinghouse interests.

Lewis B. Stillwell, consulting engineer, has attained additional distinction. He has just been named a member of the board composed of six engineers to study the country's transportation systems and to suggest ways for bettering the earning power of the railroads. His associates on the board will be John F. Stevens, Col. F. A. Molitor, J. F. Wallace, W. L. Darling and W. W. Colpitts. The board will be known as the "Board of Economics and Engineering." The members will act in the interest of the National Association of Owners of Railroad Securities. Every one of the appointees is an expert railroad man of long experience and national reputation, and the selection of Mr. Stillwell as a member of this company is a tribute to him personally and to the electrical industry, with which his entire career has been associated.

L. H. McCray has been appointed assistant to C. A. Hall, general manager of the Eastern Pennsylvania Railway, Pottsville, Pa. Mr. McCray was formerly assistant manager of the New England District of the Emergency Fleet Corporation, a position he accepted after his resignation as general manager of the Atlantic Shore Railway, Sanford, Me. Mr. McCray began his railway work with the Winnebago Traction Company, Oshkosh, Wis., which he served in various capacities from 1904 to 1907, when he resigned as assistant foreman of the transportation department of the company to become superintendent of the Sterling, Dixon & Eastern Railway, Sterling, Ill. He continued with this company until March, 1908, when he resigned to accept the position of trainmaster and assistant general manager of the Atlantic Shore Line Railway. Later he was promoted to the superintendency of this road and in 1911 was elected general manager of the Atlantic Shore Railway, Kennebunkport, Me., which had succeeded the Atlantic Shore Line Railway.

Obituary

Dr. Edward B. Rosa

Dr. Edward Bennett Rosa, chief physicist of the United States Bureau of Standards, died suddenly in his office on May 17.

Dr. Rosa did very notable work in the scientific field and particularly in electrical research. As a pure physicist alone he by his accomplishments and studies won for himself a place of honor among foremost scientists of the day. Moreover, he was an executive, guiding carefully and intelligently the work of more than 100 technical assistants in the electrical division of the bureau, the department which had been built up and enlarged by him. The details of what is known now as the National Electric Safety Code were worked out in the bureau's electrical division under his supervision.

Some of the scientific work includes the redetermination of the ratio of the units of electrical measurement, the measurement of the electrochemical equivalent of silver, the invention of new methods for measuring capacity and inductance, calculations of electrical characteristics of coils, specifications of the international candle, and electrolysis research. In connection with the last-named study he has made investigations in a great many cities and proposed methods of mitigating electrolysis caused by stray railway currents.

Dr. Rosa was born in Rogersville, N. Y., in 1861, and was graduated from Wesleyan University, Middletown, Conn., in 1886. Five years later he received his doctor's degree from Johns Hopkins University. He returned to Wesleyan as a professor of physics, where he invented a number of measuring instruments, besides conducting important investigations in electrical measurement.

In 1901 he joined the Bureau of Standards as a physicist. He was a Fellow of the American Institute of Electrical Engineers, a former director of the Illuminating Engineering Society, and one of the most active members of the American Engineering Standards Committee.

Henry W. Beebe

Henry W. Beebe, supervisor of equipment of the Connecticut Company, New Haven, Conn., died on May 19. Mr. Beebe had been in poor health for about two years but had been on the job till the end, his final illness lasting about one month.

Mr. Beebe had been in the electric railway business from its start. He was a machinist by trade, starting as an apprentice with the New Haven Clock Company. He was later with the Ansonia Electric Company, manufacturers of telegraph instruments and other electrical appliances. In December, 1893, when the old Fair Haven and Westville Railroad started to electrify, he entered the shops of this company as a machinist, later becoming the general foreman of the road. This position corresponds to that of master mechanic today. When the consolidation was effected which resulted in the Connecticut Company, he became the master mechanic of the New Haven Division. On Oct. 1, 1915, he was made supervisor of equipment of the entire system.

He was a mechanical genius in things having to do with railway rolling stock and was an expert consultant, in which capacity he acted, principally, during the last two or three years. He was sixty-four years old when he died.

William M. Grote, prominently identified with the building of the interurban lines in the Spot River Valley of Illinois, died on May 15 at the age of seventy-one. These lines, 40 miles west of Chicago, have since become a part of the Aurora, Elgin & Chicago Railroad, Aurora, Ill. Mr. Grote had resided in Elgin, Ill., for the greater part of his life and had been for many years the leader in the business activities of that community. At the time of his death he was connected in an official capacity with several banks and business enterprises.

Theron R. Hull, superintendent of the Connecticut Company, New Haven, Conn., until his retirement from active pursuits some years ago, died on May 2 in his seventy-eighth year. His initial street transportation experience dated back to horse-car days. He was superintendent of the Shelton Avenue car line in New Haven and when the Winchester Street Railway absorbed this line Mr. Hull became superintendent of the system. With the advent of the electric car he remained in the service as superintendent after the Connecticut Company, then known as the Consolidated Company, took over all the rails and equipment of the other railway properties then operating in New Haven.

Karl G. Roebling, active head of John A. Roebling's Sons Company, died of apoplexy on May 29. He had been president since October, 1918, when he succeeded his uncle, the late Charles G. Roebling. Mr. Roebling was born July 7, 1873. He prepared for college at Lawrenceville and was graduated from Princeton in 1894. Upon the completion of his schooling he worked at the Roebling mill and was shifted from one department to another until he had become familiar with all phases of the work. The Roebling company has been brought into international fame by the building of the Brooklyn and Williamsburg bridges, the suspension type of construction having been installed by John A. Roebling, the founder of the business. Col. Washington A. Roebling, who has been elected president of the company to succeed his nephew, was the engineer in charge of the bridge construction.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Railway Material Prices in February, 1921 and 1919

Several Products Now Cost Less Than Two Years Ago—Average Price Shows 8 per Cent Increase

From time to time tables have appeared in these columns showing the comparative increase in peak prices of railway material over the pre-war level. Since the downward movement of commodities set in, however, data showing just how great the recession has been in the electric railway field has been incomplete. In this connection one of the large Canadian traction companies has compiled figures which are appended below, comparing prices of material purchased by it in February, 1921, and in 1919. The comparison is made on the basis of actual purchase cost. At the same time the percentage of price increase on these products in 1919 compared with pre-war prices is presented. From the two columns of figures a fair idea of where present-day prices stand can be gained, though it must be recalled that the market represented in most instances is Canada and not this country.

The list presents the latest figures available on any considerable number of items purchased recently, but of course during the three months since February prices in a number of lines have receded still further. The greatest recession over the 1919 cost is shown in trolley wire, with nearly 39 per cent, while linseed oil is a close second with about 36 per cent. White lead, rattan, carriage and machine bolts, dry batteries and cedar poles also show considerable decreases in cost. The price of coal it appears, represents a greater increase since 1919 than any other material listed, with about a 50 per cent increase for both hard and soft coal. Lubricating oil, track bolts, cement, headlights, sand, certain armature coils, brakeshoes and pinions follow next in the order named. The average cost of all the materials given below covering the two-year period past shows an increase of 7.77 per cent.

PERCENTAGE OF INCREASE

Material	Unit	1919 Over 1913	1921 Over 1919
Bases, trolley	Each	113.1	3.73
Batteries, dry	Each	105.0	**e10.56**
Bell cord, No. 9	Lb.	140.0	1.19
Bell cord, No. 7	Lb.	143.0	0.00
Bolts, carriage, 4x¾-in	100	146.8	**6.02**
Bolts, machine, 6x¾-in.	100	135.5	**14.96**
Bolts, track, 3½x¾-in.	100 lb.	75.0	27.85
Brake shoes	Each	180.6	24.75
Bricks, fire	1,000	100.3	***6.24**
Brake hangers	Each	97.9	11.70
Coal, anthracite	Net ton	65.2	49.5[illegible]
Coal, steam	Net ton	132.4	51.35
Coils, armature, 12A	Set	61.6	*24.93
Coils, armature, 101B2	Set	92.2	* 6.76
Commutators, 12A	Set	93.2	10.10
Copper wire (trolley)	Lb.	82.4	**38.71**
Cement	Bag	141.2	27.55
Gears, 12A	Each	305.3	9.38
Gear cases	Each	235.8	12.15
Grease motor	Lb	100.6	6.65
Grease, curve	Gal.	25.9	11.77
Headlights	Each	47.4	27.39
Fittings, malleable iron	100 lb.	117.1	20.00
Oil, ammonia	Gal.	80.5	6.35
Oil, lubricating, black	Gal.	24.1	33.33
Oil, linseed	Gal	171.4	**35.79**
Pinions, 38B	Each	245.1	22.93
Poles, cedar, 45 ft	Each	48.5	***8.50**
Poles, trolley, 12-ft	Each	139.2	16.40
Rattan, seating	Sq.ft.	71.9	**4.08**
Rattan, sweeper	Lb.	244.4	**29.03**
Rails, 72-lb	Gross ton	46.1	19.78
Sand	Load	140.0	25.00
Ties	Each	163.1	*10.00
Uniforms	Each	38.5	14.57
Wheels, car, 33 in	Each	79.6	2.85
Wheels, trolley	Each	91.0	11.52
Waste, white cotton	Lb.	105.9	**5.88**
White lead	Lb.	100.0	**12.59**

* Prices as of Dec., 1920; no material bought since this date.

e—Bo'dface indicates decrease.

Car Wheel Production Lowest in Years

Steam and Electric Road Buying Is at Minimum—Deliveries Are Prompt as Stocks of Raw and of Finished Material Are Fairly Good

A survey of the market among producers of chilled iron and rolled steel car wheels reveals virtually a uniform condition of light demand. Both steam and electric lines are buying the smallest number of wheels possible to meet their requirements, inquiries are scattered, and there are no large orders being placed. A representative producer normally turning out more than 1,000 chilled iron wheels daily reports that except for one or two steam roads there has been practically no business placed for the past six months.

An idea of the extent to which roads throughout the country are stocking wheels can be gained from the business of another manufacturer who is receiving orders for twenty to fifty wheels at one time at present, where the same orders formerly totaled 1,000 to 2,000 wheels. An optimistic note is sounded by a leading producer of rolled steel wheels, however, in reporting that the wheel tonnage holds up much better than other steel products, and that considering the present readjustment period through which we are passing, business is as large as could be expected.

Production, in view of the volume of buying, is down to low levels. Operation in extreme instances is nil, and some wheel manufacturers produce only when they accumulate sufficient orders to run plants for three or four days. Still others report a production as high as 40 to 60 per cent of capacity, but the general operating scale, it seems, is lower than it has been for many years. No trouble is experienced in making quick shipments, especially as competition is very keen at the present time. Foreign producers are making their influence felt too, as evidenced by a recent South American order for 10,000 steel wheels which was carried off by a German company in competition with British and American firms.

Stocks of raw and of finished material differ rather widely as some manufacturers in reducing their inventories carry only sufficient raw material to cover current orders and either no finished wheels at all or only enough to comply with contracts. For the most part, however, raw material stocks in this field are good, with here and there a producer who is overstocked. The same applies to the finished product, as some producers still have wheels carried over from the rush period of last year, but in general only a fair quantity are on hand.

The majority of producers, it seems, remain silent on the question of prices, but one of the leading manufacturers of chilled iron wheels is responsible for the statement that quotations are about 25 per cent below the peak and that future price developments are uncertain. Another view states that big price reductions cannot be made until plants are operated on a normal basis again. Nearly all wheel companies have reduced wages, though here and there one reports undiminished labor cost. The average decrease in wages has been from about 10 to 20 per cent, with an extreme of 25 per cent.

The industry appears to be about evenly divided over the business outlook in the car wheel market. Some producers see little or no prospect of any improvement in conditions this year, while others are optimistic in tone. This optimism is apparently based on the realization of lower railway labor costs and the expectation of freight rate reductions, which it is thought would encourage a gradual return of general business.

Electrification of Philippine Railroad

According to the *Bulletin of Government Commercial Agency in New York*, the Manila Railroad Company plans to develop the water power of the Agno River in central Luzon to supply electricity to operate the railroad. It is estimated that from 12,000 hp. to 15,000 hp. can be developed.

Uneven Conditions in Car Headlight Market

Survey of Situation Among Large Producers Reveals Up and Down Volume of Demand, Stocks and Production

A survey of the manufacturing situation among virtually all the large producers in this country of car headlights used by electric railways reveals uneven conditions of demand. One of the leading manufacturers reports that the volume of business in this line is good, and a couple of others state that though buying is confined largely to replacements, demand is within 80 per cent of last year and at a higher ratio than many other equipment lines. This favorable situation, unfortunately, is not general as a number of other headlight manufacturers are finding very little new business. Some of these state that present orders cover only replacements and repair parts, while some find that new equipment, especially safety cars, accounts for most of the business that is being placed.

KEEN COMPETITION FOR ORDERS FELT AMONG PRODUCERS

It would seem, on the whole, that the headlight market is by no means brisk, as evidenced by the keen competition for orders. This is reflected in the quality of service rendered to customers, as except for one producer who quotes four to six weeks' shipment on standard headlights, virtually every company is able to make immediate shipments. In the matter of stocks of the finished product, however, some variance is shown as a few producers are carrying a normally large supply but the majority are holding their inventory at as low a point as possible. On the other hand, large stocks of raw material seem to be the rule and low stocks the exception, though this feature is constantly tending more toward normal.

Very little uniformity to production is shown. Where stocks are large it is low, as also where few orders are being received, but where headlight stocks are low and a fair volume of current orders are received, operation keeps up accordingly. This accounts for the spread between production at 10 per cent of capacity in one instance and as high as 75 per cent in another. To accomplish this curtailment working forces have been cut in several instances, on an average of 20 to 40 per cent. A number of producers have reduced wages 10 to 15 per cent, but others report that they have made no flat reductions though bonuses and similar extras have been eliminated.

PRICES DOWN 10 TO 15 PER CENT SINCE FIRST OF YEAR

Headlight prices have been reduced 10 to 15 per cent since the first of the year or the peak level, and the further tendency would seem to be still downward inasmuch as at least one producer has just made a further cut this month. The outlook for business the balance of this year in this line is generally thought to be none too bright. A quiet market is expected to prevail, though starting with the fall there is hope that demand will gradually increase and reach normalcy again by next spring.

Increase in Trolley Wire Price Is Not General

Two Producers Advance Base Price One-Half Cent per Pound, but Copper Is Again Weak

In line with the gradual firming of the copper market over the past few weeks, at least two producers of trolley wire have increased their base prices to the extent of ½ cent per pound. This is interesting in the light of the prevailing opinion that an increase in buying will very probably follow a stiff advance of prices.

That this increased demand has not developed, it is thought, is because the copper market does not consistently hold its gains and the advance in base prices by wire producers has not been general. Within the past two weeks spot electrolytic copper touched a high range of 13½ cents per pound, but it has since receded and can now be bought for 13⅜ cents.

At the present time, though base prices are quoted, they do not represent an absolute indication of prices for the reason that the market is so strongly competitive these prices are not strictly adhered to. Among several of the leading producers base quotations range in gradations of ¼ cent per pound from 15 to 16 cents. The market remains fully as quiet as it has been over the past few months. Electric railways are showing little activity and buying is mostly for maintenance, though it is said that an increase in the number of inquiries from the West is noted. The foreign market is flat and, taken all in all, the outlook seems to point to a very quiet summer.

Producers are reconciled to this, however, and are buying copper from hand to mouth for the most part. Production is down commensurate with buying, and in a number of instances plants are operated only as orders are received. Deliveries can be made promptly and on an average range from ten days to two weeks and even better. Producers of trolley wire other than bare copper, such as composition material, report a fair stock on hand that is sufficient to care for orders immediately.

Hopes are now being pinned to the fall months, as it is generally expected that September and October will see a material increase in business in this line. The basis of this belief apparently is the tremendous unfilled need for wire in the industry that is known to be existent.

Dry Cell Prices Are Reduced

Leading manufacturers of dry cells, including "Columbia," "Eveready" and "Red Seal" makes, reduced prices last week. The drop was about 16 per cent.

Rolling Stock

Elmira Water, Light & Railroad Company, Elmira, N. Y., has received the first of the eight safety cars that were ordered from the Osgood-Bradley Company during April. Delivery of the remainder is expected to follow at the rate of two per week.

The City of Miami, Fla., which has been without street car service following the total destruction of existing storage-battery equipment by fire last fall, is erecting steel lighting poles which are also being so equipped as to carry trolley span wires ultimately. Plans leading to the actual purchase of rolling stock, however, have not yet been formulated.

Hartford & Springfield Street Railway Company, Warehouse Point, Conn., has purchased two cars from the Waterbury - Milldale Tramway Company to make up for the loss of four cars which were destroyed by fire in the company's barns a few months ago. Only two cars were bought as additional open cars are being substituted for the others that were burned. The Waterbury company is letting its cars go to replace them with one-man cars.

Franchises

Pacific Electric Railway, Los Angeles, Cal. — A franchise has been granted to the Pacific Electric Railway to construct, maintain and operate a single track on Third Street and other highways in the City of Long Beach, Cal.

Track and Roadway

Portland Railway, Light & Power Company, Portland, Ore.—Officials of the Portland Railway, Light & Power Company have consented to move the tracks on Foster Road to the center of the roadway, the work involving an expenditure of $200,000, in order that other improvements may be made. Franklin T. Griffith, president of the company, explained that at no time had the company refused to move its tracks in accordance with the wishes of the city council; the company, however, did not wish to make the move until such time as it was certain that the improvement would be carried out. Officials of the company agreed to lay new tracks. They proposed that no pavements be laid between the tracks, and that certain important intersections be designated for hard surface. The rest of the roadbed will be built up with crushed rock and macadam, and the city officials have agreed to this plan. It will be necessary for the city to purchase the private right-of-way on which the street-car tracks are now located, the strip being 30 ft. wide and 6,000 ft. long, valued at about $8,000.

Washington & Old Dominion Railway, Washington, D. C.—The Washington & Old Dominion Railway has received permission to construct and operate a bridge across the Potomac River at a point suitable to the interests of navigation, at or near Point of Rocks, in Frederick, Md.

Pensacola (Fla.) Electric Company.—The Pensacola Street Railway is building a spur track to the baseball park, a distance of six blocks from the Kupfrian park main line.

Montreal (Que.) Tramway.—At the present time the company has extensions in contemplation amounting to about 15 miles of track within the city limits. As it is, the requirements demand a thousand tons of rails per year to provide against wear and tear, depreciation and breakages. In all there are about 1,500 men engaged in track work alone for the tramway company, whose summer program of a $1,500,000 expenditure gives assurance of a very considerably extended industrial activity. This $1,500,000, it was pointed out, does not include the company's own renewals and maintenance work, but covers only work necessitated by the repaving of streets by the city, a cause which necessitated most of the work viewed by the officials in a recent inspection.

Dallas-Terrell Interurban Railway, Dallas, Tex. — Construction work will start in earnest on the Dallas-Terrell Interurban line within the next sixty days, according to Richard Meriwether, Dallas, vice-president of the company. Grading work on a two mile stretch near Mesquite is going forward, and the company expects to award the main contract for completion of the line some time before July 1. The interurban committee at Terrell reports that all deals are about closed assuring right of way through Kaufman county. The awarding of the contract will be somewhat delayed on account of the death of J. F. Strickland, president of the new company organized to build this line.

Power Houses, Shops and Buildings

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—The Terre Haute, Indianapolis & Eastern Traction Company will build a new terminal station in Terre Haute, Ind., this summer at a cost of $200,000.

Cincinnati (Ohio) Traction Company.—The Ohio Public Utilities Commission has approved a contract made early this year between the Union Gas and Electric Company and the Cincinnati Traction Company for furnishing electrical current to the latter company.

Toledo Railways & Light Company, Toledo, Ohio.—Toledo's new interurban station was opened to the public on June 1. It is located at the corner of Superior and Jackson Streets, opposite the old station.

Professional Note

Chester M. Clark, formerly head of the corporation department of Stone & Webster, Inc., and during the war secretary of the underlying company at Hog Island, and assistant to Matthew Brush, the president of that corporation, has been elected treasurer of Arthur D. Little, Inc., Cambridge 39, Mass.

Merton R. Sumner has been appointed chief engineer of Arthur D. Little, Inc., chemists, engineers and managers, Cambridge 39, Mass. Mr. Sumner was formerly chief engineer for New England of Fred T. Ley & Company, Inc., in charge of about 135 construction projects and more recently was chief engineer of the Fuller Industrial Engineering Corporation, a subsidiary of the George A. Fuller Company.

L. E. Gould, Chicago, has announced that he is planning to broaden his field to include the study of energy measurement problems for which his engineering staff is well adapted. Thus on any property he is prepared to select the type of cars which will best fit existing operating conditions from an energy conservation standpoint; to determine the comparative energy consumption of various types of motor equipment, different gear ratios, heater and other auxiliary circuits under service conditions; to make surveys on voltage drop, line loss and general characteristics of the distribution system preliminary to a rearrangement of feeder copper, and to measure the energy consumption of interurban cars or freight motors on city or foreign track, so as to give the correct rate of billing for energy consumption.

Trade Notes

Pressed Steel Car Company, Western Steel Car & Foundry Company have recently moved their offices to the Seaboard National Bank Building, seventh floor, 55 Broad Street, New York City.

The Howard-Geeseka Company, 802 Plymouth Building, Minneapolis, Minn., has been appointed sales representative of the Condit Electrical Mfg. Company, Boston, Mass., in the states of Minnesota, North and South Dakota, and the northern peninsula of Michigan.

Colonel Washington A. Roebling has been elected president of John A. Roebling's Sons Company, wire manufacturer at Trenton, N. J., to succeed his nephew, Karl G. Roebling, who died suddenly at his summer home at Spring Lake, N. J., on May 29. Colonel Roebling is 84 years old and has long been identified with bridge construction projects, the most notable of which was the Brooklyn Bridge.

The Stoker Manufacturers' Association will convene for its summer meeting at the Red Lion Inn at Stockbridge, Mass., June 14, 15 and 16. The program as outlined, besides taking in discussions on the handling of stoker business, publicity, advertising, etc., will take up the establishing of a research committee for certain lines of work, new uses of stokers and a discussion of the work of the recently created fuel sections of the professional section and the A. S. M. E. revision of the power test codes.

The Esterline-Angus Company is the new name of the former Esterline Company, Indianapolis, Ind. The original company was organized in 1900 by J. W. Esterline, and in 1910 D. J. Angus became associated with Mr. Esterline in a consulting engineering business. In 1917 he became a stockholder and director of the Esterline company. Two years ago these two men bought the interests of all other stockholders, and in view of their long association in both engineering and manufacturing work they have decided to change the name of the manufacturing company to that given above. There will be no change whatever in the general policy of the company, it is announced. Mr. Esterline will continue to be the executive in charge of sales promotion and advertising, and Mr. Angus will similarly direct production and engineering.

Mica Insulator Company, 68 Church Street., New York City, announces that it has won the suit brought last year against the Mica & Micanite Supplies Corporation, a subsidiary of an English concern, for infringement of the trade-mark "Micanite" which is used to identify the plaintiff's built-up mica insulation. Judge Knox of the District Court of the United States for the Southern District of New York, entered a decree ordering that the defendant corporation be enjoined from using the word "Micanite" in any way, even as a part of its corporate name.

New Advertising Literature

Bronze Products. — The American Brass Company, Waterbury, Conn., is distributing a sixty-four-page booklet covering its copper products, etc., including price lists.

Tobin Bronze.—The American Brass Company, Ansonia Branch, Ansonia, Conn., has issued a fifty-eight-page booklet describing its "Tobin bronze" and its uses, etc., with price lists.

Wire.—The Copper Clad Steel Company, Braddock P. O., Rankin, Pa., is distributing a leaflet showing loading tables and characteristics of its Aristos "Copperweld" wire.

Space Heaters.—Space heaters for commercial and domestic heating are discussed in a leaflet, 3442, just issued by the Westinghouse Electric & Manufacturing Company, East Pittsburgh.

Bus and Board Fittings.—The Erie Electrical Equipment Company, Inc., Johnstown, Pa., has issued supplementary bulletins on split porcelain insulators, wall and floor flanges and main castings for three-way and four-way pipe combinations.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor HENRY H. NORRIS, Managing Editor
H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, June 18, 1921 *Number* 25

The N. E. L. A.'s Contribution to Power Plant Literature

THE National Electric Light Association does a good piece of work for more than its own members in the compilation each year of treatises on power matters. The reports of its special committees are so complete that they are useful to all power consuming industries. This is particularly true of the report of the committee on prime movers, which has now come to be a veritable encyclopædia in its field. The 1921 report, abstracted elsewhere in this issue, is a voluminous document replete with data which are just as applicable in the electric railway field as in that from which they were collected. The American Electric Railway Engineering Association has a committee on power generation and other committees whose activities parallel even if they do not duplicate those of the N. E. L. A. committee. It might be in the interest of economy of money and effort for the corresponding committees of these two and other associations to get together in some way. A practical suggestion to begin with is that the Engineering Association committee on power generation bring up for discussion at Atlantic City some of the high spots in the N. E. L. A. report.

One excellent feature in the compilation of this report is the way in which manufacturers of power machinery and auxiliary devices are invited to tell what they are doing respectively to advance the art. While the N. E. L. A. takes no responsibility for these statements, it does act as the clearing-house for the information. At the same time the manufacturers' statements are brought up for scrutiny and woe betide any one whose expressed hopes for his product do not tally with service performance.

Nominations for Mayor Come Thick in June

LIVELY times appear to be ahead this summer for New York City. The politicians are working overtime, and the near politicians are doing the same. The day is already counted lost upon which some one does not arise to announce himself as candidate for Mayor at the fall election. There are reforms enough ahead for busy hands to carry out, but the one to which all aspirants look longingly is the traction issue. Mr. Hylan, the present incumbent, seeks to preserve the present 5-cent fare. Mr. Bennett, another aspirant, seeks to restore it. Whatever other hopes and ambitions Mr. La Guardia and Mr. Curran, receptive candidates, may have, they also see the traction issue as one of the outstanding questions calling for immediate attention. It seems strange that where there is such unanimity of opinion, there could possibly be so much confusion of thought.

Flimsy pretexts for making an issue of the traction question abound in the reasons advanced by all the prospective candidates, particularly in view of the law enacted by the last Legislature, but the present Mayor cuts the most lamentable figure of all with his claims of preserving the 5-cent fare. The surface lines have practically all been broken up and returned to their original owners, so that 10 and even 15-cent fares are in force in many places where the 5-cent fare prevailed. Moreover, many lines have been discontinued entirely. As for the free transfer, it has become practically a thing of the past except at mass transfer points on the rapid transit lines. The passenger on the subway or the elevated pays a 5-cent fare, but then on these lines, tied in for operation under contract with the city, there is a deficit of many millions of dollars a year exclusive of interest on the city's investment for construction. This latter charge is passed on to the taxpayers and thence to the rent payer, who, in New York, is groaning under a frightful load of increased valuations and increased tax rates. Theoretically, a 5-cent fare. Practically, no such thing. It is not considered good form in the present age to confess to being old fashioned, but if one judges the transit situation in New York on the generally accepted standard of the past it would appear that Mayor Hylan, in contending that he has preserved the 5-cent fare, is guilty on the count of fraud.

A Dangerous Precedent in the Making

UNDER present circumstances, municipal ownership and operation of the entire local transportation system of Detroit seems inevitable—for better or for worse. Thus is the continuous political fight centering about the Detroit United Railway for more than twenty-five years apparently to be ended in the course of the next few years. The people have spurned all offers made by the private company and voted for municipal ownership and for the bond issues necessary to build new lines and to purchase certain existing lines. The municipal program has gained great momentum and it is being pressed forward on a big scale. Undoubtedly, the piecemeal system of purchasing existing lines which is being followed, with the franchises expired on a large part of the D. U. R. trackage, will prove very advantageous for the city. This will enable the municipal authorities to develop quickly a municipal transportation system of importance. Only those lines particularly wanted will presumably be purchased for a time, but as necessity to pay two fares to the two separate companies becomes more widespread, there will probably develop a pressing demand for complete municipal ownership.

The speed with which the municipal system is now being built and acquired is evidenced by the prospect of a mileage increased from 18 at the end of 1920 to 130 at the end of 1921. The project having gained such proportions, there is not an encouraging likelihood that the tide toward municipal ownership in Detroit will be stopped.

When all the circumstances are considered perhaps this is the only solution of Detroit's traction turmoil. The entrance of new interests in the D. U. R., as recently occurred, may change the situation. But if not, the concern of the industry is that the outcome of this particular quarrel while local in origin is far reaching in influence. If by chance the Detroit municipal ownership venture should appear to be a success, it will establish a powerful precedent for the ceaseless use of municipal ownership advocates—the first important precedent in the East and the most important in the country. Furthermore, if there can be such a thing as a successful municipal street railway system, the policies being pursued by the present Mayor, Street Railway Commission and management will tend to make it so. J. S. Goodwin, general manager, has declared that he has been under no political dictation as to jobs, equipment or methods, and that he has been free to build a railway system as a railway man would, taking into account the legal and physical limitations imposed. The railway organization has been built up of seasoned railway men who have years of experience with private railway companies behind them. As for the construction of the physical plant, while it may not be the best the industry has known, it is at least as good as that which has been built in recent years by many privately operated companies.

So far so good. While the present Mayor remains in control perhaps the railway venture will be conducted largely as a business proposition, free from political influence. But when a new administration steps in, what then? What assurance is there that the new Mayor will not succumb to the great temptation to exploit the railway, with its large number of jobs, to take care of his political henchmen and to use it in furthering his political power?

This is one of the great weaknesses of the municipal operation of any utility, especially one having so large a payroll as does a street railway. It is a great point of danger to the interests of the public. And in order that the public may know that its best interests will be served by a private transportation agency, it behooves the private companies continually to demonstrate this fact by providing excellent service at low cost and adopting constructive methods of creating and maintaining good public relations and public understanding of the aims of the company. This is the only dependable antidote for municipal ownership. When such conditions prevail, there will be no widespread demand for it, nor indorsement of the views of the unscrupulous persons who spread pernicious propaganda based largely on high-sounding falsehoods.

Avoid Contentious Publicity

THESE columns have been replete for a number of years with suggestions about the great desirability of the electric railways fostering publicity about themselves and of following the open door policy about all matters of information pertaining to them. Most of the companies that have undertaken this means of improving their relations with the public have met with some success. One example, however, stands out conspicuously as a failure. In this particular city, a persistent and energetic campaign of publicity has been engaged in for several years, but the attitude of the public toward the company has gone from bad to worse.

There is much to support the opinion that the nature of the publicity distributed has helped to undo the company rather than to improve its relations. This publicity has been largely controversial, full of rancor and more destructive than constructive. While all that has been said in the company's publication is probably true and perhaps was mild as compared to the provocation, yet aside from venting the feelings of the utility, not much was accomplished. It seems to have been pretty well demonstrated that the public is not sympathetic toward this kind of publicity and that it is not effective in accomplishing the object sought. This comment is made simply to point out the obvious lesson.

Brake Rigging Is an Important Safety Link in Car Equipment

THE great advantages of electricity as a motive power for use in railway service are its convenience, its economy in power, and the increase in track capacity made possible by its use. This increase in track capacity comes directly from the use of higher schedule speeds, which, in short runs, are made possible through higher rates of acceleration and retardation. In fact, the more adequate the provision for rapid and easy acceleration and retardation, when stops are frequent, the better the purpose of the railroad is served. It is obvious also that the saving in time secured during retardation is just as valuable as that obtained during acceleration. When braking commences, a car may possess substantially the same energy that was put into it from the power plant during acceleration. This energy can be dissipated in seconds or in minutes, but the shorter the time the nearer the company comes to getting double value from the power house, so far as time saved is concerned.

The fundamental necessity of a brake, both as a safety and a capacity increasing device, needs no emphasis, and the link in the braking process which connects the power-receiving end with the power-delivering end is the foundation brake rigging. This is as vital an element in brake mechanism as any other. With an idea of bringing more forcibly to the attention of its readers the value of keeping the foundation brake rigging in a high state of efficiency, this paper has been publishing in the past six monthly mechanical issues a series of articles by H. M. P. Murphy, describing the essentials of brake rigging and the forces developed during braking. This series of articles was written with the definite purpose of presenting this subject to the men responsible for brake operation and maintenance rather than to provide data for construction or design. The information has been given in as simple language as possible, and the mathematical formulas employed should not be confusing to the average workman. The examples have been taken from actual cases now in operation on existing electric railways, and the many illustrations given should enable the reader to see the essentials of the various parts, the functions that they perform and the importance of keeping all in proper condition and adjustment.

The concluding article of this series, which is published in this issue, deals particularly with piston travel and its effect on producing short stops through the saving of time in having this properly adjusted. When all parts are in proper condition, the capacity or pull of the rail is the measure of retardation that can be developed. However, with improper adjustment and worn parts, the condition of the braking equipment is the measure of the retardation developed. This shows the value of proper maintenance and adjustment in this vital connecting link of the braking system, if high braking efficiency is to be maintained.

Investment in Instruction Takes Little Capital

MORE and more of late one reads in the popular magazines and house organs of instances where the patronage of customers is lost through discourtesy, or, to say the least, through thoughtlessness, on the part of the person coming in direct contact with the public. People have reached the stage where courteous treatment is not only expected but demanded, and any lack of a "please-the-public" attitude means the loss of trade, business, etc. If the business is such that a person may transfer his patronage to some other concern, he does so, and probably the incident sinks into oblivion in his mind. On the other hand, any incivility toward him in the sale of a commodity in whose selection or use he has no choice incurs a more lasting enmity.

Here is where the electric railway business meets a problem difficult of solution. Platform labor, perforce, is unskilled, but the industry must have high grade salesmen to sell rides. Regardless of the excellency of service, good will cannot be created or maintained without the utmost co-operation on the part of the employees of the railway.

Electric railways are confronted by this dilemma more than any other utility. Power and lighting are mere matters of maintaining an unimpeachable service over which the managers have a definite control. This is practically their only public contact and the criterion by which the public judges. The telephone approaches the railways in respect to the circumstances requiring the maintenance of pleasant relations with its clientele, but the direct contact in this case is lacking. A speedy connection followed by a good wire is all that is asked or, in fact, expected.

To have the man on the rear end working not only mechanically but in spirit is possible and is being done. The Fifth Avenue Coach Company has accomplished wonders in furnishing a well-liked service by having its conductors cultivate public friendship. There are numerous other properties the managements of which enjoy this reputation, but they are not numerous enough.

Instruction of new employees is a subject to which ever-increasing thought is being devoted, though principally to the mechanical details of the duties required. In this schedule of instruction a place should be given to teaching the fundamentals of salesmanship, a term which includes not only the ability to sell rides but to make the rider glad and satisfied with his purchase. True selling ability instills a "come-again" feeling in the customer. It is a knack that must be cultivated and, when cultivated, capitalized. Now that the labor market is an employers' and not an employees', the men who, by training, can be developed into courteous and efficient salesmen should be sought. The support and confidence of the public can probably be no more quickly restored than through the trainmen, in whom has been instilled the paramount necessity of these virtues. Since the apogee of hardship has been passed, the time is now ripe to regain the public esteem in this respect and reap the valuable benefits therefrom.

Instruction of the sort mentioned requires only a very small capital outlay. This, with the fact that the returns are large, should make an appeal to railway men at this time.

The Function of Every Committee Should Be Clearly Defined

THE editors of this paper attend numerous committee meetings in the course of the year, many as guests, some as members. They thus gain a perspective of the inside work of several associations and secure "atmosphere" for their writing. The general impression gained from this salutary exercise is one of respect for the quality and quantity of the work thus done behind the scenes. At the same time committee activities often, nay generally, give evidence of lost motion through what might be termed "lack of definition of function or purpose."

It is a trite saying that in rifle practice a clear view of the target is essential to accuracy of aim, but the principle applies everywhere else, including committee activities. Hence before starting work, each committee ought to formulate its purpose, the needs of its clientele and the practical results which it can reasonably be expected to secure by consistent effort.

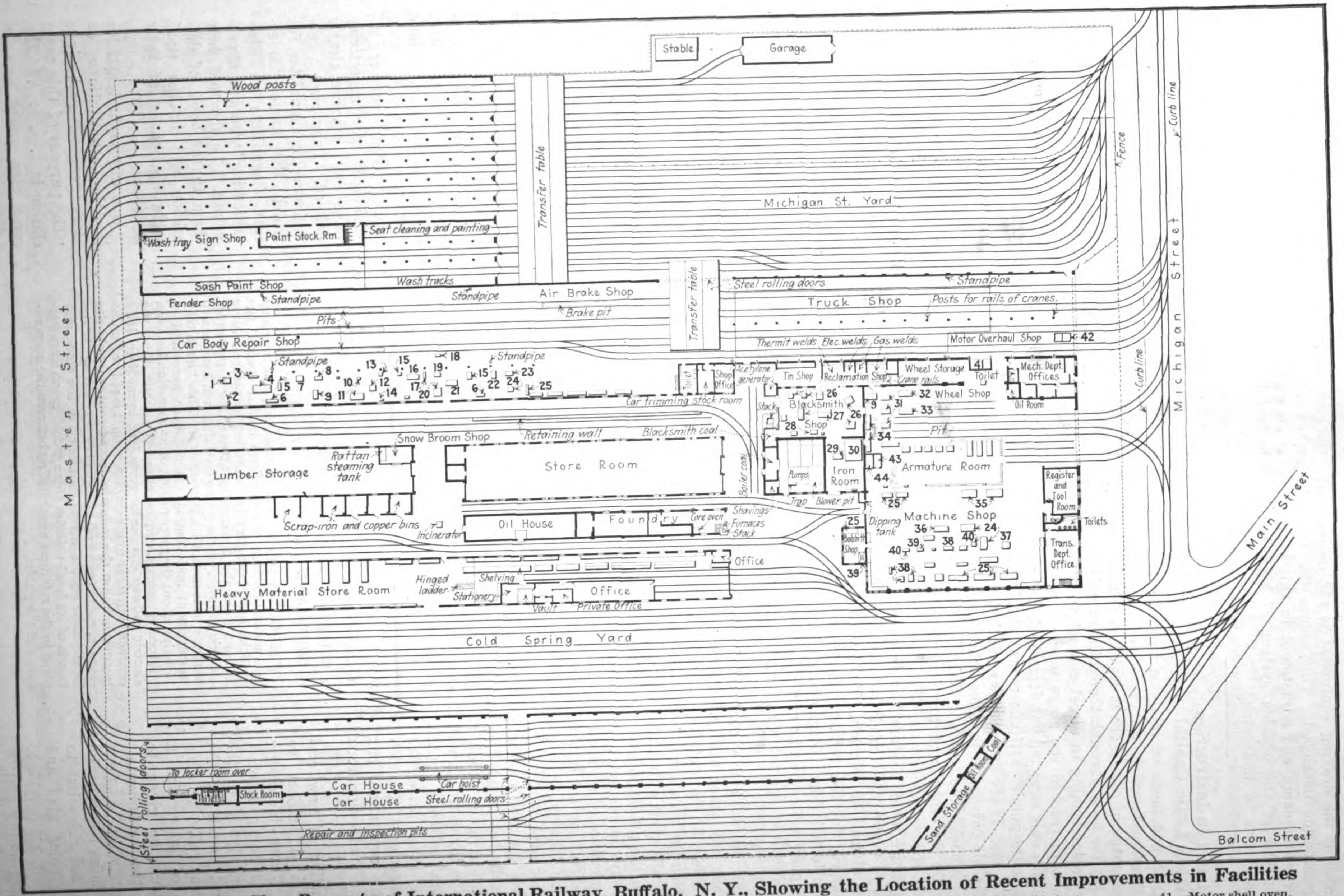
To be sure, many associations now set down lists of topics which committees are expected to consider, and this is all right as far as it goes. But it does not go far enough. Either the men who get up the lists, or the committees themselves, should define the point of view of the work. For example, take the heavy electric traction situation. It is a conspicuous case because committee work in this field is in the formative stage. Eight or nine national associations are active here. Their committees are duplicating work. They neither individually nor collectively have their purpose clearly defined. They need a central steering committee, for which the name "American Committee on Electrification" would be appropriate. This would help them in the work of definition and in the equitable distribution of their activities.

One of the first articles in the constitutions of most organizations begins: "The purpose of this association is . . . ." The same plan might well be followed by committees in their work.

Quotation from the Federal Electric Railways Commission Report

No. 25

THROUGH this system of financing and management (holding companies and banker control) the utilities have been largely controlled by persons living distant from the community affected by a particular electric railway, whose prime consideration has been to secure a return upon the property. This "absentee" management and control has not been successful in bringing about the proper spirit of co-operation between the local managers, employees and the public. Since the electric railway companies come into immediate daily contact with large numbers of people, it is of the utmost importance that the industry should gain and hold the respect, confidence and good will of its patrons. If the local public should invest its money in the stock and bonds of its local utilities there would be an improvement in the relations now existing between the corporation and the public.

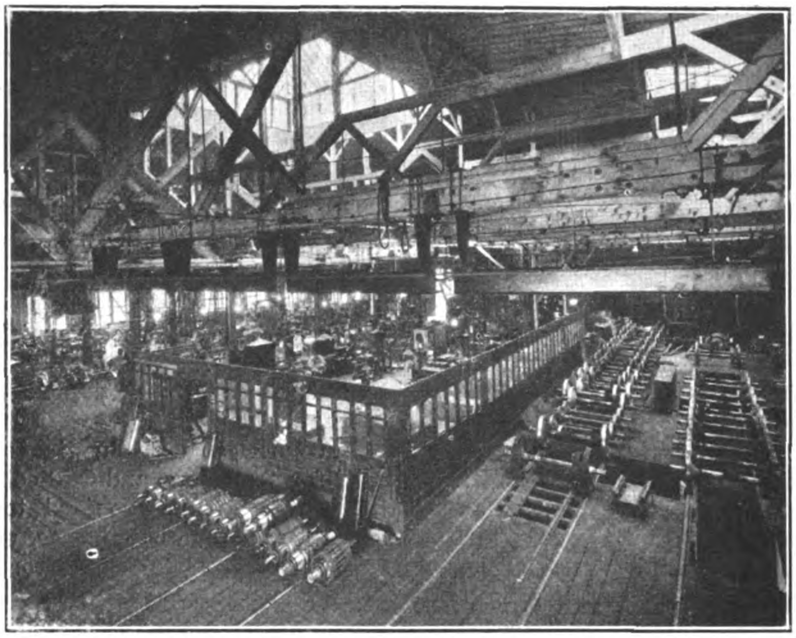

Stable
Garage
Wood posts
Transfer table
Michigan St. Yard
Fence
Curb line
Michigan Street
Wash tray
Sign Shop
Paint Stock Rm.
Seat cleaning and painting
Wash tracks
Sash Paint Shop
Standpipe
Fender Shop
Air Brake Shop
Brake pit
Steel rolling doors
Truck Shop
Posts for rails of cranes.
Pits
Car Body Repair Shop
Thermit welds
Elec. welds
Gas welds
Motor Overhaul Shop
42
Toilet
Shop Office
Acetylene generator
Tin Shop
Reclamation Shop
Wheel Storage
Crane rails
41
Mech. Dept. Offices
Oil Room
Car trimming stock room
Stack
Blacksmith Shop
32 Wheel Shop
Pit
Snow Broom Shop
Retaining wall
Blacksmith coal
Boiler coal
Pumps
Iron Room
Armature Room
Lumber Storage
Rattan steaming tank
Store Room
Trap
Blower pit
Register and Tool Room
Toilets
Scrap-iron and copper bins
Incinerator
Oil House
Foundry
Core oven
Shavings
Furnaces
Stack
Babbitt Shop
Dipping tank
Machine Shop
Trans. Dept. Office
Main Street
Masten Street
Office
Heavy Material Store Room
Hinged ladder
Shelving
Stationery
Office
Vault
Private Office
Cold Spring Yard
To locker room over
Stock Room
Car House
Car House
Car hoist
Steel rolling doors
Steel rolling doors
Repair and inspection pits
Sand Storage
Oil Room
Coal
Balcom Street

Plan of Cold Spring Shop Property of International Railway, Buffalo, N. Y., Showing the Location of Recent Improvements in Facilities

1—Resaw.
2—Stock saw.
3—Sheet metal rolls.
4—Double surface planer.
5—Automatic knife grinder.
6—Jointer.
7—Band saw.
8—Automatic mortising and boring machine.
9—Motor.
10—Mortising machine.
11—Sticker.
12—Pony planer.
13—Drill press.
14—Emery wheel.
15—Circular saw.
16—Boring machine.
17—Grinder.
18—Chain mortise.
19—Carver.
20—Sander.
21—Molder.
22—Tenoner.
23—Band saw.
24—Shaper.
25—Lathe.
26—Forges.
27—Hammer.
28—Oil furnace.
29—Shear.
30—Iron rack.
31—Boring mill.
32—Wheel press.
33—Wheel grinder.
34—Air compressor.
35—Wheel lathes.
36—Grinder.
37—Milling machine.
38—Drill.
39—Radial drill.
40—Saw.
41—Motor shell oven.
42—Motor shell dipping tank.
43—Armature and field baking oven.
44—Impregnating oven.

Shop Notes from Buffalo

Reclamation Shop Is Producing Attractive Savings—Dipping of Motor Shells a New Feature—Ingenious Plan for Portable Mounting of Electric Locomotive Control Apparatus Developed—Shop Layout Changes Here and There Tend to Facilitate Maintenance Practice



IN THE CENTER OF THE MACHINE SHOP IS HOUSED THE ELECTRICAL DEPARTMENT, IN AN INCLOSURE SET OFF BY A PARTITION MADE OF OLD CAR DOORS

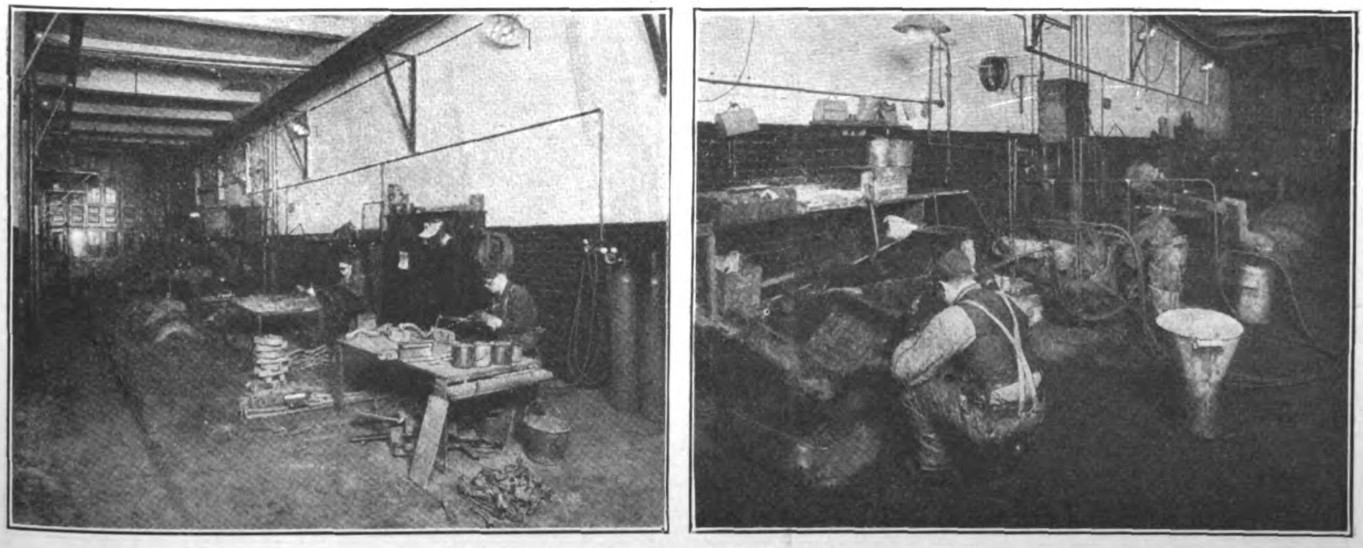
THE practices followed in the Cold Spring shops of the International Railway at Buffalo, N. Y., now operated by the Mitten Management, Inc., have been mentioned and illustrated in the ELECTRIC RAILWAY JOURNAL from time to time. Recent articles have covered dipping and baking of armatures and field coils (Feb. 21, 1920, page 286) and compressor maintenance (March 3, 1920, page 608). Although these shops have been in use for many years they are well adapted to modern maintenance practices and they are being constantly modified to meet changing conditions. The present article embodies the observations of a member of the editorial staff of this paper who visited the shops recently.

THE WELDING SHOP

The outstanding feature of recent changes is a welding shop where gas, electric and thermit welding is done in close co-ordination with the sheet metal and forge shops. The three shops are operated under the foreman of the reclamation department, who is thus able to subdivide the reclamation work among the three to produce the best over-all results. The welding and sheet metal shops occupy a long narrow room, 16 ft. wide, which was created by putting a concrete roof with skylights over a runway between the truck shop on one side and the wheel and blacksmith shops on the other. At present the 150 ft. of available length is divided up by means of light partitions thus: The tin shop has 32 ft.; the welding shop (including small office), 102 ft., and the motor-shell oven, 16 ft.

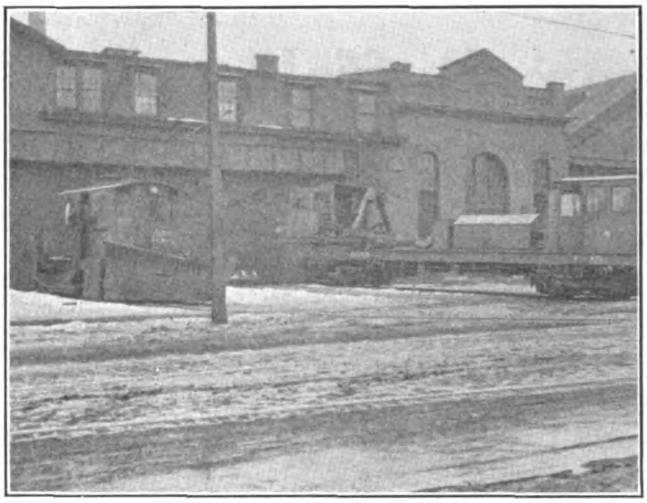
The reclamation or welding shop may be considered as divided longitudinally in half, one side being an 8-ft. runway and storage space, which is served by a trolley crane. On the other side are stalls separated by light, portable partitions, about 8 ft. high, for the three types of welding. The generator used to furnish acetylene for the gas welding is housed in a small "lean-to" adjacent to the tin shop.

A summary of the work which has been done in the

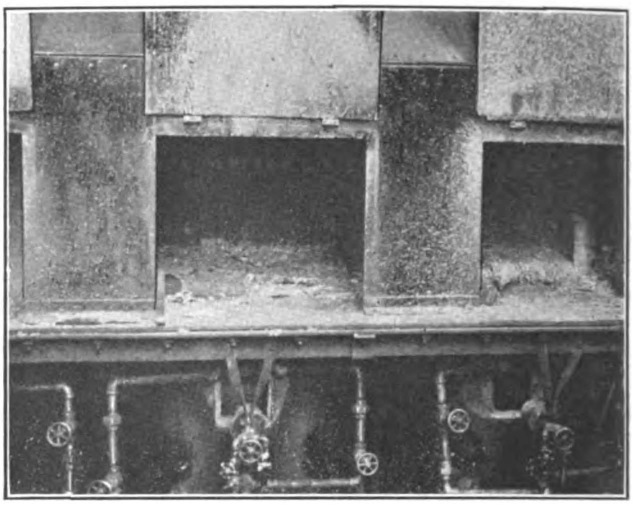


TWO VIEWS IN THE NEW WELDING SHOP

View at left is toward tin shop and shows crane and crane runway, electric welders in foreground and thermit welder in background. View at right shows thermit welder in foreground at work on the repair of a truck frame. The portable partitions between welders' stands were removed for the purpose of making these pictures.



MICHIGAN STREET FRONT OF COLD SPRING SHOPS
The photographer fortunately caught two important pieces of equipment just as they were being put away in the carhouse.



PART OF ROW OF BABBITT POTS
These are heated by gas or kerosene burners and have thermostatic control for babbitt temperature.

reclamation shop during recent months, as gaged by the dollars saved over costs of replacement without reclamation, is given in an accompanying table.

Among recent interesting jobs of welding two were those illustrated. One is a repair to a piece of manganese special trackwork, a switch in which the tread had been broken away. An insert was welded in to replace the broken part and a plate was welded on the side to support it, with the excellent result shown. The second job is the welding of oil boxes on the bearing housings of old motors built for grease lubrication, also illustrated. The routine work consists of the usual run of patching worn and broken gear cases, mending broken motor shells, etc. Thermit is used to a considerable extent on truck frames, the material being bought in large quantities. This is done in the interest of durability, on the principle that where much metal is to be added the thermit process is in the end economical, even if more costly at the time because the metal in the weld is of very high quality.

DIPPING AND BAKING PROGRESS

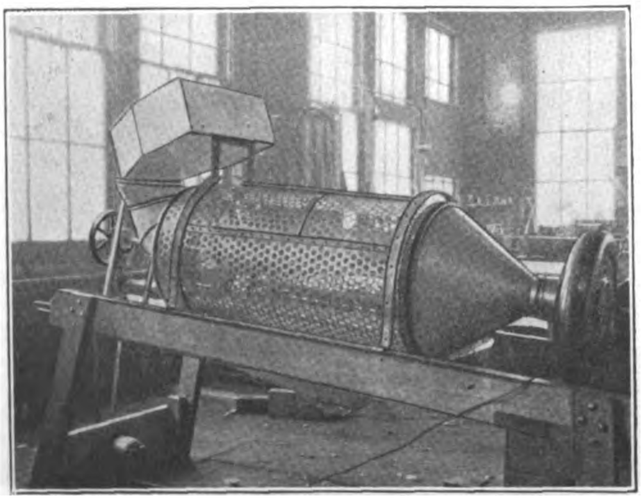
Supplementing former dipping and baking practice, as described in the earlier article referred to, the company is now subjecting small motor shells to this process and is preparing to do the same even with the largest motors. A heavy black varnish is used for fields and clear varnish for armatures. A special large dipping tank has been installed near the front of the motor overhaul shop.

In connection with the dipping and baking equipment used for armatures and field coils, located near the armature room, it is proposed to substitute a monorail crane for the one now in use, which requires the transfer of baskets of field coils from a crane bar outside the oven to one inside. The proposed monorail would run direct into the oven.

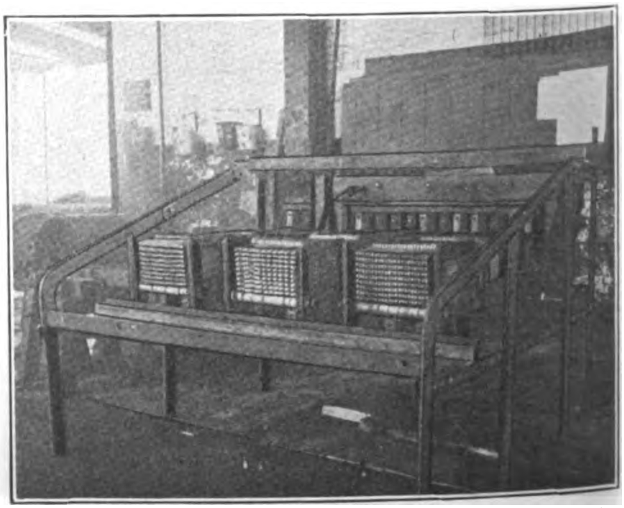
SOME RAPID PIPE THREADING

Among other recent time-savers is a double pipe-threading machine, which has been provided with an electric motor drive. This is installed in the air brake shop, where it is used for threading brake pipe, as well as conduit for use in rewiring cars, a job which is under way near by.

The spindles of the threading machine are geared to run at 75 r.p.m. and an inch of thread can be cut in about 6 seconds on a 1-in. or ⅞-in. pipe. The thread cutting dies kept normally in the machine are those for the two most commonly used sizes of pipe, so that a pipefitter who needs a piece of pipe threaded can do this work with a minimum of time and effort.



THIS MACHINE SORTS PAPER TICKETS AND COINS BY MEANS OF A ROTATING PERFORATED DRUM AND A CENTRIFUGAL FAN



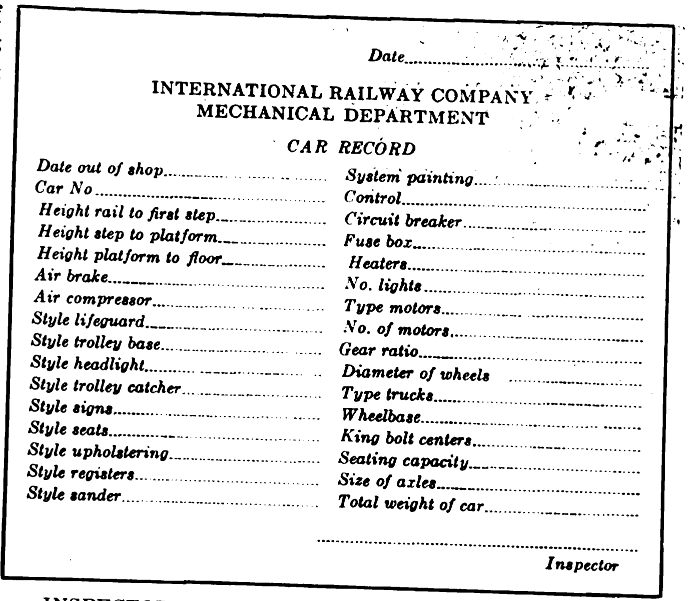
SLIDING FRAME USED IN MOUNTING CONTROL APPARATUS ON ELECTRIC LOCOMOTIVE. ROLLERS STILL TO BE ATTACHED

SUMMARY OF CASH SAVED BY THE RECLAMATION DEPARTMENT FOR THE YEAR 1920 AND PART OF 1921

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Electric equipment:														
Armature parts	$307.32	$124.50	$158.12	$219.29	$28.56	$172.70	$160.07	$54.68	$201.37	$281.12	$313.77	$174.19	$126.28	$193.40
Gear cases	732.52	911.96	626.69	903.14	1,498.35	1,447.79	1,220.99	1,322.35	742.91	2,199.67	1,490.04	1,122.91	1,952.66	1,422.25
Motor shells	....	715.00	615.00	830.00	345.00	865.00	1,015.00	1,885.00	745.00	335.00	260.00	624.50	130.00	390.00
Motor caps	20.79	36.96	25.41	6.93	16.17	20.79	13.86	13.65	35.72	44.16	11.55	56.75	3.60	9.00
Miscellaneous electric	8.77	....	71.85	40.33	65.54	148.59	52.93	34.78	136.79	145.44	146.26	223.42	156.88	65.69
Brakes:														
Air brake and compressor	69.70	....	....	9.61	35.91	55.89	55.90	14.74	111.67	64.02	176.30	91.20	123.49	15.51
Air tank and valves	35.30	....	....	....	....	72.00	36.00	177.90	140.75	224.67	70.60	143.87	19.40	5.12
Brake levers and miscellaneous	72.73	7.05	28.50	66.25	18.29	65.40	83.48	73.58	165.32	330.22	357.03	340.54	566.31	295.34
Car body:														
Seats, doors, steps, etc	416.46	....	47.38	137.58	118.48	272.85	224.72	239.60	301.96	514.37	432.52	439.17	269.42	565.13
Truck:														
Truck frames	1,592.00	2,982.00	4,176.00	2,500.00	4,176.00	4,156.00	2,926.00	2,102.00	1,648.00	1,037.00	1,490.00	4,116.00	1,754.00	6,502.00
Truck miscellaneous	33.85	24.85	285.32	495.21	70.73	164.57	271.33	261.73	436.78	568.25	1,054.90	787.65	868.43	460.77
Track:														
Track and service equipment	52.25	....	25.00	25.00	21.00	64.00	24.00	32.20	9.00	13.50	77.35	73.05	89.25	710.43
Tools:														
Tools and equipment	20.00	2.10	14.00	5.00	9.95	8.00	8.50	5.60	5.00	12.50	38.05	22.20	21.05	37.05
Miscellaneous welding and cutting with gas	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Castings and forgings	113.10	310.69	299.66	251.28	329.87	818.81	838.21	714.19	759.34	813.66	448.64	395.75	618.46	789.84
Total	$3,474.79	$5,115.11	$6,372.93	$5,489.62	$6,733.85	$8,332.39	$6,930.99	$6,932.00	$5,439.61	$6,583.58	$6,367.01	$8,611.20	$6,689.23	$11,461.53

1920—Grand total $76,383.08

1920—Average saving per month 6,365.25



Date..........

INTERNATIONAL RAILWAY COMPANY
MECHANICAL DEPARTMENT

CAR RECORD

Date out of shop..........	*System painting*..........
Car No..........	*Control*..........
Height rail to first step..........	*Circuit breaker*..........
Height step to platform..........	*Fuse box*..........
Height platform to floor..........	*Heaters*..........
Air brake..........	*No. lights*..........
Air compressor..........	*Type motors*..........
Style lifeguard..........	*No. of motors*..........
Style trolley base..........	*Gear ratio*..........
Style headlight..........	*Diameter of wheels*..........
Style trolley catcher..........	*Type trucks*..........
Style signs..........	*Wheelbase*..........
Style seats..........	*King bolt centers*..........
Style upholstering..........	*Seating capacity*..........
Style registers..........	*Size of axles*..........
Style sander..........	*Total weight of car*..........

....

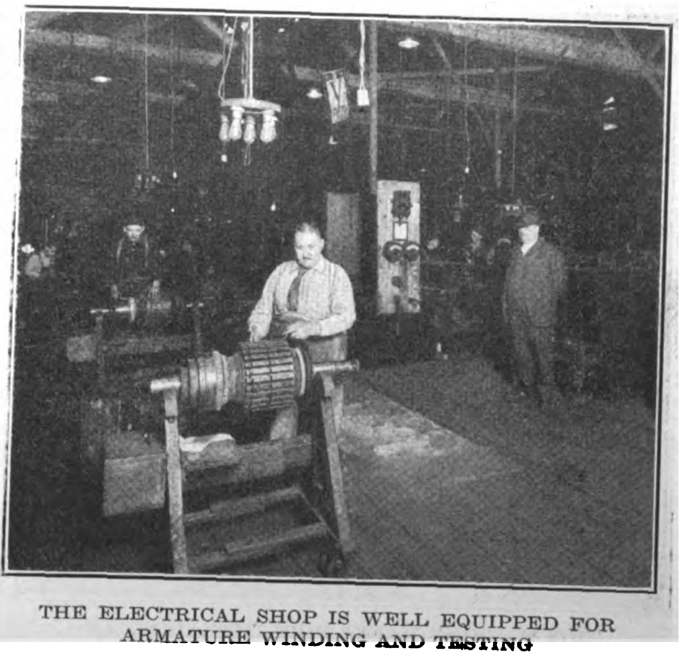
Inspector

INSPECTOR'S RECORD OF CAR CHARACTERISTICS

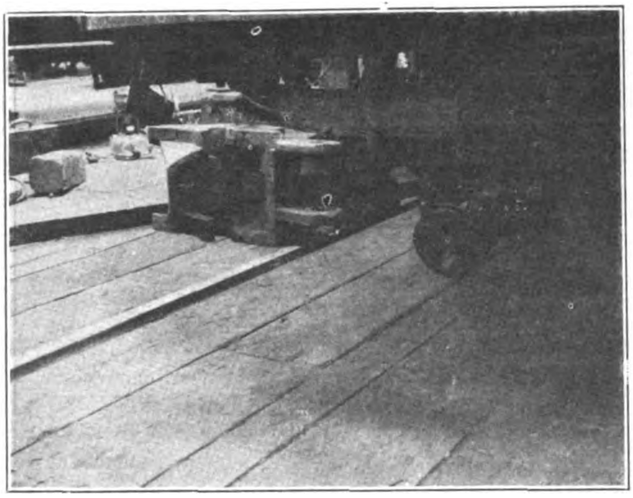
Mention of the conduit suggests that as cars go through for extensive overhaul they are being rewired in metal conduits in accordance with a systematic plan. This will be an important item in reducing car maintenance cost. In connection with this change in wiring, the jumper sockets for cars equipped to operate in trains are being mounted on the drawheads in the manner shown in one of the illustrations. This not only permits the use of shorter jumpers but reduces wear on the jumpers, which was excessive when the sockets were mounted on the bumpers.

An interesting job recently put through the shop was the remodeling of one of the Lockport line freight locomotives, which has been in service many years. This locomotive has the cab in the center with a projecting hood at each end to cover the auxiliary apparatus. The air apparatus is on one end and the resistance frames and connection board are on the other. All of the resistance frames and accessories have been mounted on a framework made up of strap steel, as illustrated, the whole mounted on rollers so as to roll on rails. The photograph reproduced was taken before the rollers had been put on, but shows the resistance frames in place. This gives a portable mounting, by means of which the whole group of devices can be drawn out into the cab for inspection and repair.

Considerable study has been given to the lighting of the shops, particularly in the armature and machine shop. An arrangement which has been found entirely satisfactory is to place 500-watt nitrogen-filled incandescent lamps, 20 ft. apart each way, and about 20 ft. from the floor. These are mounted in home-made funnel-shaped tin reflectors about 2 ft. across the bottom. The effect secured is very much like daylight and except for close work no supplementary, individual lamps are required. As will be noted in the general plan, the electric shop is partitioned off from the machine shop. The partition is made of discarded car doors which were mounted in simple framing. This provides a partition



THE ELECTRICAL SHOP IS WELL EQUIPPED FOR ARMATURE WINDING AND TESTING



MOUNTING THE JUMPER SOCKETS ON THE DRAWHEADS REDUCES JUMPER TROUBLES

which is amply high to give the privacy necessary to efficient work, while at the same time the electrical department quarters are well ventilated and lighted.

In connection with the electrical shop, a feature of interest is a new testing switchboard, with a water rheostat mounted directly behind it. The rheostat consists of a wood tank, with suspended plates operated by a screw, which terminates in a handwheel on the front of the switchboard. The reclamation department is not the only one which makes use of welding and cutting apparatus. For example, in the rehabilitation job on interurban cars, mentioned earlier, it was found economical to use a gas torch in cutting out metal pieces which were scheduled for removal, such as brackets, straps, etc. These large cars are equipped with couplers which connect the air line as well as furnish mechanical coupling, although the electric lines are separate. It was found desirable to supplement the large couplers by extra drawheads to permit coupling city cars to the interurbans.

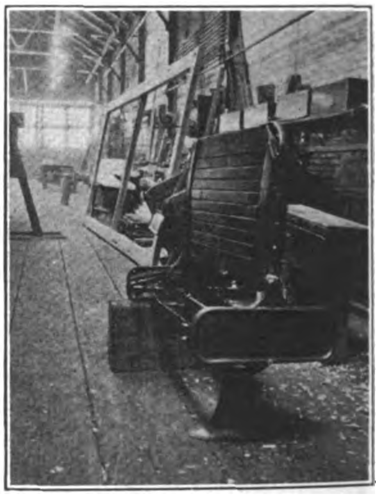
OIL BOX WELDED ON BEARING HOUSING OF OLD MOTOR

The practice of using slat seats and backs has recently been adopted. A photograph reproduced shows one of the seat backs as changed over from the cane-covered cushions formerly used.

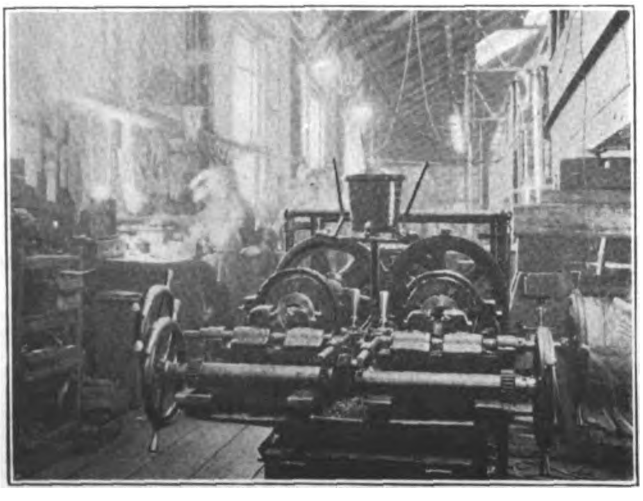
On the interurban cars also the Miller trolley shoe is used. This operates satisfactorily, but it is found that it must not be allowed to run too long so as to wear into grooves.

In the Forrest carhouse of the International Railway an ingenious jib crane has been installed to permit light repairs to be made. The crane was fabricated out of old 6-in. T-rails, two being used to form a column. The two rails for this purpose are placed side by side with heads and base reversed and bolted firmly together. The upright is set 4 ft. in a concrete floor and the upper end is secured to one of the beams forming the roof trussing. The boom, also made of two T-rails, is supported by a diagonal brace of rails below and a guy rod extending from the outer end to the upper support of the vertical column. The boom is hinged to the upright so as to give it range of action ample for the purpose for which it is used.

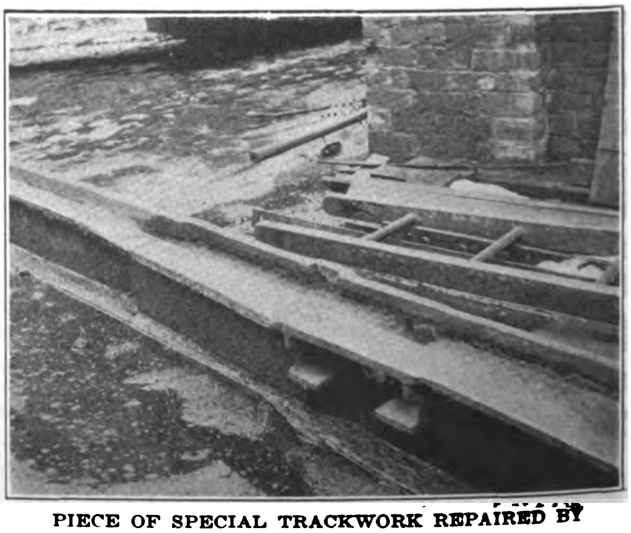
One of the accompanying illustrations shows a machine which has recently been developed in the shops for the purpose of separating the metal tokens and coins from paper transfers. It consists essentially of a motor-driven rotating perforated cylinder with a hopper at one end and a suction fan at the other. The perforations are just large enough to clear the largest coins, and inside are longitudinal veins which raise and drop the contents of the cylinder.



WOOD SLAT SEATS AND BACKS FOR INTERNATIONAL'S CARS



THIS MACHINE MAKES PIPE THREADING AN EASY JOB



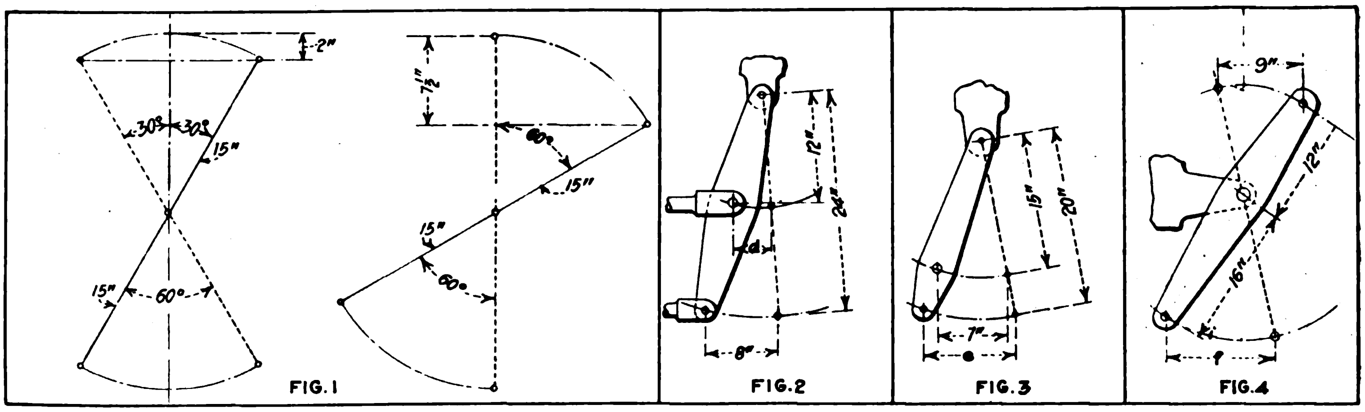
PIECE OF SPECIAL TRACKWORK REPAIRED BY ELECTRIC WELDING

Piston Travel and Shoe Clearance*

The Relation Between Piston Travel and Shoe Travel Is Determined—With a High Total Leverage Slight Shoe Wear Produces a Great Variation in Piston Travel Which Is Objectionable—Various Examples Illustrate Methods for Finding the Motion of Levers and Their Proper Release Positions

By H. M. P. MURPHY

THE term "total leverage" represents the total number of pounds of brake-shoe pressure that are obtained for each pound of force exerted on the brake-cylinder push rod. Consequently it is clear that in order to obtain any desired degree of braking force or percentage of braking power on a given car, with a specified air pressure in the brake cylinder, the greater the value of the total leverage employed the smaller is the size of the brake cylinder required, and, therefore, in order to reduce the cost of installations and also to minimize the amount of compressed air used in an application of the brakes, it is always advisable to use as high a total leverage as is consistent with good practice. On the other hand a very high total leverage is objectionable because with it slight shoe wear produces a great variation in piston travel. The reason for this is explained below.



DIAGRAMS SHOWING MOTION AND POSITION OF VARIOUS LEVERS

The increase in piston travel due to the wear (or travel) of brake shoes is equal to the average amount of wear (or travel) of the shoes multiplied by the total leverage employed. For example, if in a certain brake system the average wear per shoe is 0.2 in. in a given time, and if the total leverage is 9, the increase in piston travel (due to the specified amount of shoe wear) will be equal to $0.2 \times 9 = 1.8$ in.

To secure the proper operation of the automatic brake, which depends largely on the relative volumes of the auxiliary reservoir and the brake cylinder, it is important to use a reasonably low total leverage and thus to maintain an approximately constant piston travel in spite of ordinary shoe wear. In steam-road service, where the cars receive attention at only long intervals and where the piston travel is not adjusted regularly, a lower total leverage is necessary than in electric railway service, where systematic inspection and maintenance can generally be relied upon. Moreover, in traction service the amount of air consumed per car would be excessive if the piston travel were long and the leverage low (a high leverage permitting the use of a small brake cylinder for a car of given weight) as brake applications are usually very frequent in such service. For these reasons it is customary to adhere as closely as possible to the piston-travel standards which have been fixed by the best practice, and which must be carefully maintained in service in order to secure satisfactory results. It is important to note in this connection that the standard piston travel should always be the average of the maximum and minimum values actually obtained.

A further reason for adhering to established standards of piston travel and braking power is that it is most essential to provide for clearance between the brake shoes and the wheels when the brake is released. Now, as there is always a certain amount of lost motion in a foundation brake rigging, the use of either a very high total leverage or an excessively short piston travel might easily result in the dragging of the brake shoes. Of course, if there were no lost motion between the push rod and the shoes the shoe clearance would be exactly equal to the piston travel divided by the total leverage. Thus, if the piston travel is 5 in. and the total leverage is ten, the shoe clearance would be five divided by ten, or ½ in. However, owing to the clearances in the pin holes and to the spring and "give" of the various parts of the rigging, the shoe clearance would actually be considerably less than this value.

Further, the piston travel obtained when a car is standing is usually an inch or two less than that obtained when a car is running, because the vibration and motion of the various parts provide for their better adjustment in the latter case. Consequently allowance should always be made for this inequality, as it is the correct "running" piston travel that must be maintained. Of course, if the brakes are applied while the train is in motion and held on till and after the stop is made and thus measured the piston travel will have the "running" value.

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*This is the sixth and last of a series of articles on forces developed in brake riggings. Others appeared in the Jan. 15, Feb. 19, March 19, April 16 and May 21 issues of this paper.

DETERMINING THE MOTION AND POSITIONS OF LEVERS

A very important consideration in the installation and adjustment of brake apparatus is the motion or travel of the various parts concerned. In dealing with this subject, the primary requirement is, of course, that the location and dimensions of all moving parts be so chosen that each lever and rod will always be unobstructed in its movements, even when the brake shoes are worn down completely and the brake-cylinder piston has traveled to its maximum limit. Otherwise the brake might easily be rendered totally ineffective. An additional requirement of good practice is that all levers, except the truck levers, should stand at right angles to their connecting rods when the brake is fully applied and the piston travel has the standard running value for the case in question. This applies particularly to the two cylinder levers. The connecting rods will thus maintain their required approximately parallel directions much more nearly than would otherwise be the case, for obviously when a lever is moved through half of a specified angle on each side of a perpendicular position with respect to the connecting rods, the resulting deflection of these rods will be much less than when the lever is moved through the same angle but not equally on both sides of the perpendicular. This is illustrated in Fig. 1.

In order to determine the travel or the position of any moving part of a brake rigging, it is merely necessary to remember that when a lever (or standard bell crank) turns about one of its three points as a center, the two other points travel in circular paths, and therefore the length of the path passed over by each of these points is in direct proportion to its distance from the center about which the lever turns.

To illustrate this principle consider the levers shown in Figs. 2, 3 and 4. In Fig. 2 the lower end point is known to travel 8 in., and consequently the distance, d, traveled by the middle point is found thus:

$$d = \frac{12}{24} \times 8 = 4 \text{ in.}$$

Again, in Fig. 3, the middle point is known to travel 7 in. and, therefore, the distance, e, traveled by the lower end point is found thus:

$$e = \frac{20}{15} \times 7 = 9\tfrac{1}{3} \text{ in.}$$

Also in Fig. 4, the upper end point is known to travel 9 in., and consequently the distance, f, traveled by the lower end point is found thus:

$$f = \frac{16}{12} \times 9 = 12 \text{ in.}$$

A general rule may now be readily stated as follows: When a lever or bell crank turns about one of its three points as a fixed center, and the travel of a second point is known, to find the travel of the third point divide its distance from the fixed center by the distance of the second point from the fixed center and multiply this result by the known travel of the second point.

In cases where a lever has no positively fixed point, as for example a cylinder lever or a live truck lever, the problem of finding the travel of a specified point can also be easily solved by the foregoing rule if each of the two points whose travel is given by the conditions of the problem is considered in turn as being fixed. In order to illustrate this method the following examples will be given:

Let it be required to find the total travel of the pull rod, in Fig. 5, necessary to take up 1 in. of shoe clearance on each pair of wheels. The clearances of 1 in. are represented in the figure by the distances BG and EM, the position of the mechanism before the brake is set being indicated by the lines ABC, CD and DEF.

It is obvious from an inspection of the diagram that the total travel of the pull rod is equal to the travel necessary to bring the left-hand shoes against their wheels plus the travel necessary to bring the right-hand shoes against their wheels. Now, assuming that the rigging is drawn in its release position ($ABCDEF$), consider that the point E is temporarily fixed and that the pull rod is moved to the right until the left-hand shoes are brought tight against their wheels, the lever, ABC, assuming the position AGH, the rod CD moving to the position HK, and the lever DEF taking the position KEL. Then, to find the distance FL (*i.e.*, that part of the travel of the pull rod necessary to apply the left-hand shoes) it is only requisite to find the distance KD, which is, of course, exactly equal to the distance HC, and, as A is fixed point, $HC = \frac{28}{21} \times BG = \frac{28}{21} \times 1$ in. $= 1\tfrac{1}{3}$, whence $KD = 1\tfrac{1}{3}$ in. and

$$FL = \frac{21}{7} \times KD = \frac{21}{7} \times 1\tfrac{1}{3} = 4 \text{ in.}$$

The point K, instead of E, may now be considered as a fixed point (which it actually is as it cannot be moved any further to the left) and the pull rod may be moved to the right till the right-hand shoes are brought tight up against their wheels, the lever KEL assuming the position KMN. The distance LN (*i.e*, that part of the travel of the pull rod necessary to apply the right-hand shoes) being found thus, as K is now a fixed point:

$$LN = \frac{28}{7} \times EM = \frac{28}{7} \times 1 \text{ in.} = 4 \text{ in.}$$

Consequently the total travel of the pull rod is

$$FL + LN = 4 \text{ in.} + 4 \text{ in.} = 8 \text{ in.}$$

Let it be required to find the total piston travel necessary to move each of the pull rods in Fig. 6 a distance of 5 in. as shown. The release position of the rigging is indicated by the lines ABC, BE and DEF. The piston travel necessary to bring the lever DEF into the position DKL may be found by considering point C of lever ABC as a temporarily fixed point and then causing the lever ABC to assume the position GHC, for the distance EK is equal to BH, and as D is a fixed point,

$$EK = \frac{16}{36} \times FL = \frac{16}{36} \times 5 \text{ in.} = 2\tfrac{2}{9} \text{ in.}$$

whence, $BH = 2\tfrac{2}{9}$ in.

and, therefore, the piston travel (AG) required to move the left-hand pull rod a distance of 5 in. is,

$$AG = \frac{36}{20} \times BH = \frac{36}{20} \times 2\tfrac{2}{9} \text{ in.} = 4 \text{ in.}$$

about the point H, till it assumes the position MHN. a fixed point (which it actually is as it cannot be moved any farther to the right) and the cylinder push rod moved out still further till the right-hand pull rod has traveled the required 5 in., the lever GHC revolving about the point H, till it assumes the position MHN. It is now clear that the piston travel necessary to move the right-hand pull rod a distance of 5 in. is equal to GM, and as H is now a fixed point,

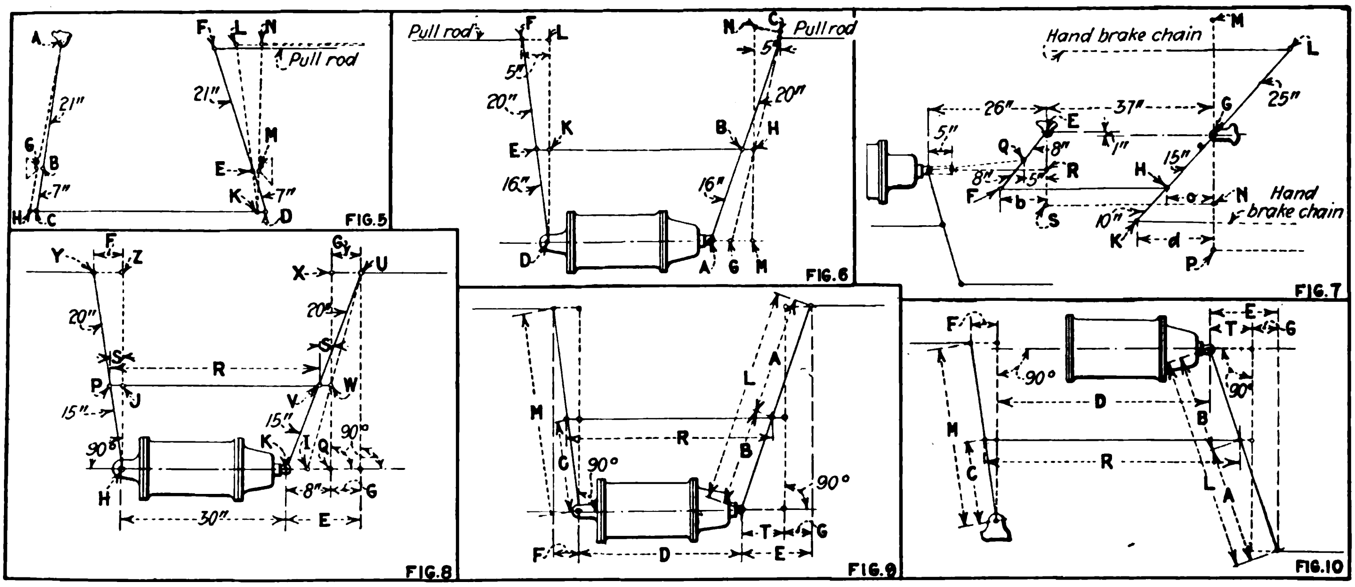
$$GM = \frac{16}{20} \times 5 \text{ in.} = 4 \text{ in.}$$

Consequently, the total piston travel required to move both pull rods 5 in. each is,

$$AG + GM = 4 \text{ in.} + 4 \text{ in.} = 8 \text{ in.}$$

DETERMINATION OF THE PROPER RELEASE POSITIONS OF LEVERS

In designing a brake rigging, the method generally preferred is to make the layout with the brakes in release position, the positions assumed by the parts concerned, when the brake is applied both with new and worn-out shoes and also when the piston travel has its maximum possible value (which is usually 12 in.), being carefully laid off, to make certain that no obstructions to the proper motion of these parts will be met. In order to accomplish this, and also to determine the release positions which the various parts should have (as well as the lengths of tie rods, etc.), so that the main levers may stand at right angles when the brake is set and the piston travel has its standard value, it is merely necessary to apply the rule previously given for the motion of levers, etc. The following examples will illustrate the general methods employed for this purpose:



TRAVEL OF PULL RODS AND POSITIONS TAKEN BY LEVERS

Let it be required to find the release positions of the two hand-brake multiplying levers applied to an electric car on which the piston travel is to be 5 in., if these levers are to stand at right angles to the center line of the car when the hand brake is fully applied. The dimensions and general location of these levers are shown in Fig. 7. The points E and G are fixed.

The first step is to draw the lines ES and MP through the points, E and G, so that they are perpendicular to the center line of the car. Next, lay off $ER = EQ$, $ES = EF$, $GM = GL$, $GP = GK$ and $GN = GH$. Then the lines ERS, SN and $PNGM$ represent the position which the rigging should assume when the brake is applied. The release positions of the levers may now be found with respect to the lines ES and MP. Let the lever ES be swung to the left till the point R has traveled the required 5 in., as shown, the lever assuming the position EQF. The distance b, which locates the release position of the lever EF, is found by aid of the rule for lever motion as follows:

$$b = \frac{16}{8} \times 5 \text{ in.} = 10 \text{ in.}$$

and as the rod SN has assumed the position FH, the lever GNP has swung into the position GHK, the distance c being approximately equal to b; that is,

$$c = b = 10 \text{ in.}$$

Consequently the distance d, which locates the release position of the lever GK, is found as follows:

$$d = \frac{25}{15} \times c = \frac{25}{15} \times 10 \text{ in.} = 16\tfrac{2}{3} \text{ in.}$$

Moreover, the proper length of the rod FH or SN should be just 37 in., as may be seen by an inspection of the figure, and the length of the chain attached to the cylinder push rod should be 26 in. minus 5 in., or 21 in. The lever LK or MP is designed to permit of the application of the hand brake from either end of the car. When the brake is applied from the right-hand end, the portion of this lever to be considered is GNP or GHK, just as if the portion GL or GM were not attached to it and when the brake is applied from the left-hand end of the car the portion to be considered is LGH or MGN, just as if the portion HK or NP were not attached to it. In either of these cases, it is evident that when a given force is applied to the hand brake chain concerned, the forces delivered to the points H and N will have the same values.

Let it be required to find the proper release positions of the cylinder levers shown in Fig. 8 so that when the piston travel is 8 in. both levers will stand at right angles to the center line of the cylinder, the total braking force and shoe clearance on each truck being the same and consequently half of the piston travel being used to apply the brakes on each truck.

First, draw perpendicular lines through the points H and Q, the latter being 8 in. (which represents the given piston travel) from the point K. The location of the center line of the connecting rod PV or JW is, of course, given by the dimensions of the levers, and the distance PJ is equal to VW. Then considering the point U as temporarily fixed:

$$PJ = VW = \frac{20}{35} \times (\tfrac{1}{2} \text{ piston travel}) = \frac{20}{35} \times 4 = 2\tfrac{2}{7} \text{ in.}$$

Next, by drawing the lines HPY and KVU, the release positions of the levers are determined, for

$$F = YZ = \frac{35}{15} \times PJ = \frac{35}{15} \times 2\tfrac{2}{7} = 5\tfrac{1}{3} \text{ in.}$$

Also,

$$G = XU = \frac{20}{15} \times QI = \frac{20}{15} \times 4 = 5\tfrac{1}{3} \text{ in.}$$

and,

$$E = KQ + G = 8 \text{ in.} + 5\tfrac{1}{3} \text{ in.} = 13\tfrac{1}{3} \text{ in.}$$

The length of the rod PV or JW must clearly be equal to the distance HK plus the piston travel; that is, $R = PV = JW = HK + KQ = 30$ in. + 8 in. = 38 in.

As the type of problem illustrated by this example is an extremely common one and must, therefore, be solved very frequently, a short method for determining the distances F, G, E and R (see Figs. 8, 9 and 10) will now be given.

FORMULAS FOR DETERMINING THE PROPER RELEASE POSITIONS OF CYLINDER LEVERS

The following formulas are entirely general and apply to all cases where the total braking force and shoe clearance are the same on both trucks, whether the cylinder levers are or are not divided in the same ratio, or whether they have the same total length or not. The symbols used are indicated in Figs. 9 and 10, T representing in all cases the standard piston travel for the car in question, *i.e.*, T is the piston travel for which the levers are to be at right angles to the center line of the cylinder when the brake is set.

The formulas are:

$$G = T \times \frac{A}{2 \times B}; \; F = T \times \frac{A \times M}{2 \times L \times C}$$

$$E = T \times \left(1 + \frac{A}{2 \times B}\right) \; R = T + D$$

To show how the use of these formulas simplifies calculation, let it be required to solve the example given in the preceding paragraph and covering the construction of Fig. 8, where the following values are assigned to the various symbols:

$$A = 20 \text{ in.}, B = 15 \text{ in.}, L = 35 \text{ in.}, C = 15 \text{ in.},$$
$$M = 35 \text{ in.}, T = 8 \text{ in.}, D = 30 \text{ in.}$$

Substitution of the given numerical values of A, B, L, C, M, T and D in the formulas gives the desired results, thus:

$$G = T \times \frac{A}{2 \times B} = 8 \times \frac{20}{2 \times 15} = 5\tfrac{1}{3} \text{ in.}$$

$$F = T \times \frac{A \times M}{2 \times L \times C} = 8 \times \frac{20 \times 35}{2 \times 35 \times 15} = 5\tfrac{1}{3} \text{ in.}$$

$$E = T \times \left(1 + \frac{A}{2 \times B}\right) = 8 \times \left(1 + \frac{20}{2 \times 15}\right) = 8 \times 1\tfrac{2}{3} = 13\tfrac{1}{3} \text{ in.}$$

$$R = T + D = 8 + 30 = 38 \text{ in.}$$

Thus the same results are obtained by this simple method as were found by the long process previously employed.

Progress in Prime Mover Design and Practice

N. E. L. A. Committee Returns a Bulky Report Indicating the Recent Improvements and Standardizations Effected in Power Generation

LAST week a brief report of the National Electric Light Association convention, held at Chicago from May 31 to June 3, was printed together with an abstract of the report of the committee on steam railroad electrification. The committee on prime movers, of which N. A. Carle is chairman, produced a masterful and inclusive compilation on practices and tendencies in steam power generation. The committee has not duplicated the efforts of other societies but has co-operated with them.

The report comprised more than 350 pages nearly as large as the pages of this paper. The function of this committee was stated to be "to investigate and report developments in the design, installation and operation of prime movers and accessory equipment for the production of power from fuel for the generation of electricity." The report covered the several phases of the subject as summarized below:

In steam turbines the maximum size of single-cylinder units is still limited to 45,000 kw., and there has been no appreciable change during the past year in steam pressures and temperatures, although it is felt that higher pressures and temperatures are a possibility for future application. The trend of European practice seems to be toward definitely higher speed, higher superheat and higher pressures. In addition there is a tendency to standardization of performances, ratings, tests guarantees and principal dimensions of turbogenerators. It is felt that similar action by American interests would be productive of much good.

Turbine lubrication is receiving much attention. It imposes complicated requirements on the manufacturer and the oil refiner. The committee offered for consideration a tentative general specification for turbine oils. As regards oil purification, the continuous system and the continuous by-pass system are the most effective.

The latest development in turbine foundation design is the three-point flexible suspension devised by Akimoff. Accurate static and dynamic balancing are recognized by turbine manufacturers as of prime importance. Machines which have been scientifically balanced show a marked improvement in their operation.

Manufacturers are working on the development of a closed system of generator ventilation, in which the same body of air is constantly recirculated. The basic idea is to obtain cleaner air than is possible by washing free air, and to reduce fire hazards.

In condensing equipment the regulation of the flow of circulating water to provide for seasonal variation in cooling water temperature is being considered. Such regulation would reduce power required for driving circulating pumps and avoid lowering the condensate to a temperature below that corresponding to the vacuum.

In plants whose supply of raw water is not fit for boiler feed, particular attention should be paid to condenser leakage. Where leakage is likely to be dangerous, such expedients as expanding the tubes into one or both tube sheets or using double tubes with an intermediate draining space have been proposed or adopted.

In boilers there is a tendency toward larger sizes, higher pressure and higher superheat, although 300 to 350 lb. and total temperatures of 600 to 650 deg. seem to be as high as boiler designers are willing to go at present. The continued high cost of economizers has led boiler manufacturers to develop a boiler with a higher tube bank to get at least part of the saving which could be realized with an economizer.

Improvements have been made during the year in soot-blowing equipment, which while not entirely satisfactory is generally recognized as a necessary adjunct to the modern boiler.

On horizontal-tube boilers there is a marked tendency toward the use of baffles inclined at an angle of less than 90 deg. to the tubes. This plan is readily adaptable to furnace space requirements and desired flue-gas velocities.

The larger boiler units and the higher peak ratings with consequent fluctuations in rate of steaming are giving turbine manufacturers some concern because of fluctuations in superheat and consequent fluctuations in temperature of turbine parts. Several superheater manufacturers, anticipating this difficulty, are working on the design of separately fired superheaters.

The excessive cost of high-grade coal and consequent necessity for utilizing low-grade coal have forced manufacturers of stokers to adapt designs to meet new conditions. The successful application of forced draft to chain-grate conveyor-type stokers opens up to this type a field heretofore pre-empted by the underfeed stoker.

The packing and arching-over of coal in stoker hoppers can be practically eliminated by the use of power-operated agitators installed at the base of the hopper. On the principle that the supply of coal and air is proportional to the rate of steam, several manufacturers are offering systems which control stoker speeds and the speeds of fans and other auxiliaries, through a master controller actuated by differences in steam velocities. None of these systems has been in service long enough to justify unqualified indorsement.

ECONOMIZERS AND OTHER POWER-PLANT AUXILIARIES

As to economizers, partially offsetting their high cost at present are such other considerations as excessive coal prices, high flue-gas temperatures and the improvements in economizers and fans. Relatively few changes have been made in the design of cast-iron economizers, but manufacturers of steel-tube economizers report many new developments. Considerable interest is being shown in the wrought-steel type on account of the higher boiler pressures now in use or contemplated.

Corrosion, internal and external, is the most serious problem confronting the operator of economizer equipment. It is generally agreed that where trouble is being experienced from internal corrosion some method must be used for freeing the air of dissolved gases. The remedy for external corrosion of tubes is to raise the temperature of the inlet water to the point where condensation of moisture does not take place under conditions of steady operation. Economizer leakage is another matter that requires care, especially in design and construction.

The most economical methods of maintaining heat balance in the larger stations are the house turbines in combination with a heater condenser and the straight electric drive with bleeding of the main units for feed water heating. The use of a house turbine lowers the cost of auxiliary switching equipment and reduces short-circuit current on auxiliary circuits. In general, American manufacturers of feed pumps limit pressure to 100 lb. per stage, although one is now building a single-stage pump, and in England a single-stage high pressure pump has been built for pressures around 400 lb. One pump manufacturer reports the installation of a complete plant for testing pumps with hot water under service conditions. This is a step in the right direction and should lead to beneficial results.

Practically no trouble was experienced from spontaneous combustion in coal piles during the past year, largely because coal stocks were low. As regards coal-crushing apparatus, some members of the association feel the manufacturers have developed crushers of large capacity at the sacrifice of uniformity of product. A decrease in peripheral speed of rolls would probably remedy this to some extent. Automatic coal samplers have not met with entire success on account of the difficulty of securing a representative sample.

Disposal of ashes by sluicing appears to be gaining in favor. A combination of sluicing troughs and sand pumps was reported from one plant.

LINE WELDS MUST BE MADE CAREFULLY

A few years ago line welds were considered advisable in station piping to reduce the number of flange joints, but experience gained since indicates that they may be dangerously weak unless carefully made. There are several types of butt-weld joints in which the welds are reinforced with sleeves. Such joints have proved amply strong.

As to valves, practically all stations using steam above 200 lb. have standardized on steel-body gate valves with complete monel metal trim. Both hydraulically and electrically operated valves are being extensively used, a preference being shown for the electrically operated valve with the Dean type of control. Considerable experience has developed from leaking safety valves, often due to the carrying of the weight of the bent piping on the valve body. In many cases this can be overcome by installing a slip joint close to the valve outlets.

It is hoped that a standardized color code for identifying the several types of power plant piping can be agreed upon as a result of the committee's activity along this line.

The development of new types of boiler and turbine room instruments during the past year is promising. New instruments offered by manufacturers include: (1) Recording pyrometers for indicating boiler furnace temperature; (2) combined CO_2 and CO recorders; (3) multiple-type draft gages; (4) flow meters for indicating small rates of flow of liquids under pressure, such as bearing oil or jacket water; (5) meters based on the principle of the alternating-current potentiometer for detecting condenser leakage.

EVAPORATOR EQUIPMENT ENTIRELY SUCCESSFUL

On the subject of feed water purification, a questionnaire to member companies operating evaporators for feed purification indicated that evaporator equipment is successful and provides pure water at reasonable cost. The internal use of any substances in boilers seems to be coming into general disfavor. In general it will be found more satisfactory to treat the water in a separate treating apparatus.

Developments in the field of pulverized fuel indicate a continued interest on the part of engineers in this method of burning coal. The Milwaukee Electric Railway & Light Company recently put into operation the new Lakeside plant, which will have an ultimate capacity of 200,000 kw. and which is designed for burning pulverized fuel.

Eliminating the restrictions imposed by the layout of old stations in changing over from grates or stokers to pulverized fuel equipment, the question of high boiler ratings does not seem serious. Such ratings are being obtained in new plants where boilers have ample combustion space and are designed expressly for burning pulverized fuel. The whole question of burning fuel efficiently is in process of solution and no one can foresee the ultimate end.

With respect to the burning of fuels other than coal, the committee report gives a number of suggestions regarding oil and gas burning. The burning of oil for power generation involves two economic considerations. Oil is used where it is the most efficient source of heat because of the absence of an adequate supply of cheaper fuel. It is used where such use affords a means of consuming an excess accumulation of crude oil, residues or distillates for which no other market is available.

Brake-Rod Testing

Breakage in Service of This Important Link in the Brake Rigging Is Made Improbable by the Testing of All Rods to Three Times the Stress to Which They Are Ordinarily Subjected

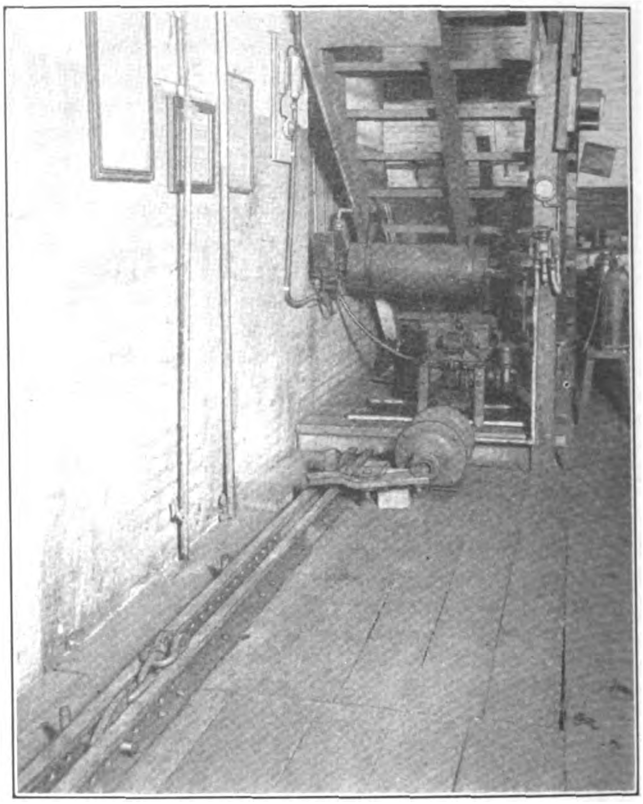
THE Washington Railway & Electric Company had two serious accidents due to breaking of air-brake pull rods, and it became necessary to give very close study to the condition and strength of the rods with a view to preventing a repetition of such occurrences. At first a test was made on all cars of the system by running the air pressure (which ordinarily is 70 lb.) up to 120 lb. and then, while the brakes were rigidly applied, rapping the brake rods sharply the whole length with a 2-lb. hammer. Several faulty rods were thus found and broken. The causes of the breaking were found to be crystallized metal, poor material and, in a few cases, improper welds. None of these causes could be located by a close inspection, as some of the welds looked perfectly good, but when broken showed the weld to be only 25 to 50 per cent good, and the poor material or crystallization showed up only when the rods were broken.

In deciding on improvements the first thing was to get some good, dependable steel for making new rods, and after several tests electric furnace steel was decided upon. This was found to be tough, ductile and easily welded. One of the tests made was to bend a piece double while cold and put it under the hammer.

The ordinary machine or soft steel which the railway had been using fractured under this test, but no amount of hammering would make the electric steel show the slightest sign of a fracture. In making new pull rods great care is taken in making welds and the metal is allowed to cool very slowly. Every completed rod before installation is put through a tension test in the special machine shown in the accompanying illustration, which was made in the company's shops for the purpose.

A separate air compressor and tank for this testing outfit were installed as the railway did not want to use the shop air line on account of the uncertainty of the air pressure being just what was wanted, namely, 100 lb. per square inch. The tank is small so as to allow the full pressure to be pumped up quickly and at the same time is large enough so when air is applied to the cylinder it does not appreciably lower the pressure.

The cylinder is 10 in. in diameter and the leverage is arranged to give 8,000 lb. pull on the brake rod under test, which is more than three times what the rod will get in service. The base to which one end of rod under test is fastened is made of two 50-lb. T-rails each 15 ft. long. The whole length of the web of these rails is drilled with $1\frac{1}{16}$-in. holes to allow a 1-in. pin to be easily slipped through. The two rails are rigidly bolted together with the edges of the base touching, leaving a space between the ball of the rails in which a large link can be slipped and held in place with the pin. This link has a short chain, with shackle fastened to it, which is used to fasten the brake rod at that end. The other end of the brake rod is fastened to the cylinder lever. Brake rods up to 12 ft. in length can be tested on the machine. The piping between the air tank and the brake cylinder is as large as possible. An ordinary straight air brake valve is used to apply the air which is admitted directly to the brake cylinder.



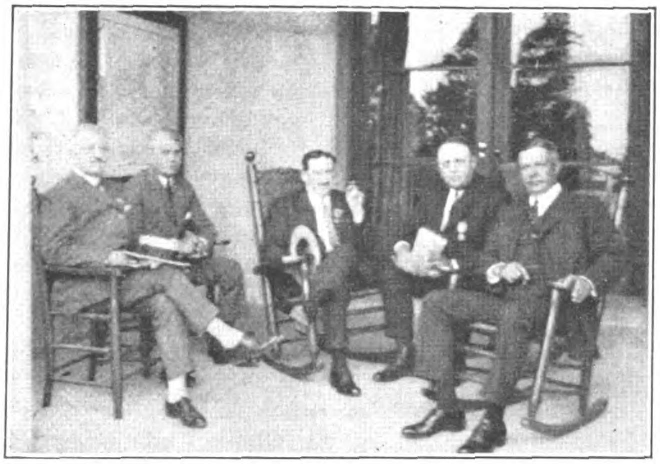
ONLY GOOD BRAKE RODS PASS THE TEST

The brake rod when under stress is rapped sharply with a hand-hammer, so as to show up any weak portions. In case a brake rod breaks under this test, a stop is provided which catches the lever, and a port in the side of the cylinder releases the air when the piston comes out beyond what it would under ordinary conditions. The pull rods on all cars passing through the general repair shops are tested on this device, and several defective ones have been found that would otherwise very likely have broken down in service and caused serious delays if not accidents.

N. Y. E. R. A. Meets at Lake George

The One Day's Session Was Devoted to Discussions on One-Man Car Operation and Taxation—Two Prepared Papers Were Presented—W. O. Wood Was Elected President for the Ensuing Year

ONE-MAN car operation and taxation occupied the attention of 250 members and guests at the thirty-ninth annual meeting of the New York Electric Railway Association, held in the Fort William Henry Hotel at Lake George on June 11. President T. C. Cherry, in speaking in his official capacity, referred first to a statement in President Harding's inaugural address that the war had left various burdens, and then listed the specific burdens which the war had left on the electric railway industry. These were: Increased floating debts, deferred maintenance, labor contracts covering unreasonably high wages, labor contracts containing burdensome working conditions, contracts for material at abnormally high costs, large investment in materials and supplies on hand, a demand for necessary capital expenditures, and loss of credit.



PRESIDENTIAL GROUP AT LAKE GEORGE CONVENTION
Left to right: W. H. Collins, T. C. Cherry, J. F. Hamilton, H. B. Weatherwax and W. O. Wood.

Fundamentally, Mr. Cherry said, electric railway transportation is a legitimate, sound business, but at present, while it is still legitimate, it is not sound, and the operators are confronted with the problem of restoring the industry to its par value. Nevertheless, it seemed to him that in the last two years the public mind has become more favorable to the industry. Instances have occurred where the city council has offered no objection to a fare higher than that stated in the franchise. This condition has been accomplished by educational work performed by operating men.

Mr. Cherry thought that the phrase "efficient operation" had been overworked. He suggested as a substitute the phrase "honest operation" and said that the manager who can effect intelligent economy in operation is performing his part in restoring the industry to its par value. Such a man can meet the employees of his property, the patrons of his road and the stockholders of his company without excuses.

Secretary-Treasurer William F. Stanton read a report covering the membership and financial situation showing the association to be in a flourishing condition in both respects.

ONE-MAN CAR OPERATION DISCUSSION PROVES STIMULATING

The introductory paper on one-man car operation was read by W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company. It is abstracted elsewhere in this issue. He was followed by W. H. Burke, Stone & Webster, Boston, Mass. Mr. Burke's paper appears in abstract on another page.

R. B. Stearns, vice-president and general manager of the former Bay State System, who was present by invitation, traced the history of the application of one-man operation on that property. He credited it largely with the recent local improvement in financial status. This property was formed of seventy or more original railways covering a territory roughly 100 by 40 miles in extent and having 940 miles of track, of which 187 has been discontinued as unprofitable. Changing conditions, including the spread of the automobile, turned it from a profitable to a non-paying property, until in 1916 operating expenses took nearly or quite the entire revenue. Economies were about to be inaugurated when the company went into receivership. Later the property was acquired at a foreclosure sale by the Eastern Massachusetts Street Railway.

The State Legislature, finally appreciating the necessity for preserving electric railway service, passed legislation permitting operation by State trustees, having comprehensive powers. Taking advantage of the opportunity thus afforded, the public trustees were able to secure some money, which was partly spent in applying one-man operation. Safety cars were purchased and old cars were remodeled, a large amount of worthless rolling-stock being destroyed.

Service with the new cars was inaugurated in the spring of 1920 and by the close of the year 250 cars were in use. In the summer of 1920 400 double-truck cars had been converted for one-man operation, and they were put into commission as soon as the labor situation warranted. Men who had operated the small cars picked the large ones when privileged to do so under the seniority rule, indicating a satisfactory attitude toward them.

Starting with the operation of these cars in September, 1920, the company rapidly increased the number in use until today 93 per cent of all of the service operated on the system is one-man; 54 per cent with double-truck and 39 per cent with Birney cars. The remaining 7 per cent comprises two-man, double-truck cars, most of which will permanently require two men for various reasons including use in two-car trains. The system is now practically "saturated" as far as one-man operation is concerned. The Birney cars weigh, with track scraper, 16,500 lb. All of the company's one-man cars have been equipped, at a cost of $80 per car, with a device for making an emergency safety stop, as is required in Massachusetts. None of these devices, as far as known, has been used by a passenger to date.

As to one-man-operation savings, Mr. Stearns said that these amount to $1,250,000 per annum. The energy saving of 16,000,000 kw.-hr. with the small cars, with coal at $10 per ton, is $240,000 and the labor saving $400,000. This is about $2,500 per car, in addition to savings in track and equipment maintenance. The large cars save $600,000 yearly. The total number of men on the payroll is now 2,400 as compared with 4,700 or more a year ago. Of the difference between the present and former operating staffs, 1,300 or more represent trainmen.

The safety cars are giving good service under widely varying conditions, former schedules are being maintained, and two-man operation is an almost forgotten idea. No difficulty is experienced with fare collection in zoned territory. The safety cars are averaging 31,000 car-miles per annum and the large cars on special runs or in tripper service 20,000 car-miles.

Mr. Stearns also spoke of the labor and fare situations on his property, which have been covered in recent issues of this paper.

ONE-MAN SERVICE ON SECOND AVENUE RAILROAD

Charles E. Chalmers, receiver Second Avenue Railroad, New York City, who has been operating this property for more than a year, told of his efforts to meet high costs by remodeling cars and operating them with one man on the East Side in that city. Having no money wherewith to purchase safety cars he is making over double-truck cars as described in a recent issue of the ELECTRIC RAILWAY JOURNAL.

As the property comprises lines operating through districts with foreign-born populations there was at first some uncertainty as to the result. The first four cars were made for either one-man or two-man operation, but as they proved popular as one-man cars later practice has been to make them straight one-man cars at a cost of $315.30 per car. This cost will be saved in one year through accident reduction alone. The Second Avenue line was first equipped and for the first five months of the year showed earning power practically equal to the two-man cars on First Avenue even when the popular open summer cars were used on the latter. Selecting a day at random, Mr. Chalmers found on June 2 that the one-man cars took in $35.97 each and the two-man cars $34.62. The present plan is to change 100 open cars to a convertible type for all year one-man service. The one-man cars are faster, also.

With average wages of 62 cents per hour on the one-man and 57 cents on the two-man cars and a ten-hour day, the former saves $364 per day for fifty cars with night service or $133,152 per year.

Karl A. Simmon, Westinghouse Electric & Manufacturing Company, the next speaker, said the present single-end standard safety car weighs 15,300 lb. and the double-end car 15,800 lb. One great advantage of the standard safety car is that it can use standard equipment, and the history of the safety car motor shows that it has been manufactured in its present form for about five years, which is a fairly long time for a motor.

Changes in motor design mean changes in the machinery for manufacturing motors, and frequent changes increase the cost of manufacture. Where protection against cold weather has been introduced in the car, its weight has got up to about 17,000 lb.

Up to the time that the weight of the car did not exceed 16,000 lb. it was what might be called a "universal" car; that is, it could be used under almost any conditions of grade, etc. Above that weight the motors might be overloaded under arduous conditions of grade, acceleration, etc., as the motor capacity would then be less than 6½ hp. per ton. The weight in different forms of transportation, per passenger carried, varies from nothing, with walking, to about 2,200 lb. per passenger seat in a Pullman car. Within these two limits will be found the most economical weight.

George H. Tontrup, National Safety Car & Equipment Company, St. Louis, said that car standardization means not only a cheaper car but that the companies could more easily finance their car purchases. It had been shown that a light car can be built as strong as a heavy car. The very early safety cars weighed less than 13,000 lb. and they are still in good operating condition. If the railway companies want to make changes in the present standard car they should decide what changes they want and then standardize on those changes.

J. C. Thirlwall, General Electric Company, said that in the addresses of Mr. Gove, Mr. Burke and Mr. Stearns the delegates had heard from the users of about one-fourth of all of the safety cars in the country and they had testified to its success. The car is now recognized as being suitable even to very congested streets in large cities, as on lower Fulton Street in Brooklyn. Mr. Stearns was pioneering with the one-man car for interurban use. The speaker then gave the facts about safety-car interurban service on the Cincinnati, Milford and Blanchester Railway, described in the issue of this paper for May 28. He told about the system of fare collection on the line, which has twenty-two zones, and said that in the four months the system has been in operation there has been no over-riding, so far as the company knows. He said he had asked the car operators if the system of fare collection used had delayed them in the operation of the cars and they had replied that it had not and they preferred it, as they were "not bothered by conductors." One-man car operation of interurban cars was in about the same status now as city operation was three or four years ago, but the speaker saw no reason why one-man cars could not be used on interurban roads, unless possibly on the most heavy routes. He urged the use of safety devices on the cars if for no other reason than to satisfy the public. He also urged the use of a light car for its reduction on power consumption and declared that on the Cincinnati line mentioned the power saving was considered as great as the labor saving. This condition of affairs would be apt to occur on other interurban lines.

DISCUSSION ON TAXATION

Ralph R. Rumery, consulting engineer of New York, then described the development of the last few years in taxation of the electric railway companies in New York State. He said that the principal state taxes were local taxes on real estate and the special franchise tax. The division of the money received from the state income tax among the various tax districts upon the basis of the assessed valuation of real property in each tax district provides an incentive to the local taxing body to increase local assessments. Certain firms of engineers are circularizing the state offering their services toward increasing corporation assessments, taking a percentage of such increases as their fee. In view of this situation, the companies should be prepared to offer evidence as to proper assessment figures. Where the local assessments of corporation property are obviously too high, he urged that the figures be brought to the attention of the Bureau of Equalization of the State Tax Commission. This bureau has a corps of engineers whose duties are to assist in the correct valuation of property subject to local assessments.

There is a movement now, he said, to substitute for the special franchise tax a tax on gross earnings, which would bear with special severity on those companies with high gross but low net receipts. Moreover, the speaker said the history of gross earnings taxes was usually a gradual increase in the percentage of the tax. In conclusion he urged greater care in calculating depreciation for inventories. He said that most companies used the straight line method and referred to numerous instances where this method had given incorrect results.

H. C. Hopson, specialist in utilities, certified public accountant, etc., New York, said that there was a great variation in the policies in the different states in regard to taxation of public utilities, particularly electric railways. This fact should be borne in mind in any comparison of wages paid or fares charged, because with taxes as high as they are at present the amount of taxes to be paid has a marked effect on the fare which must be charged and on the ability to pay wages. He listed the taxes which the electric railway companies of New York have to pay as follows: State taxes: State, county and real estate city tax; tax on special franchise; gross earnings tax; tax on dividends amounting to 3 per cent on dividends in excess of 4 per cent; mortgage recording tax. Federal taxes: net income tax on issuance of capital stock. Special taxes: paving transportation tax; tax on interest on mortgage bonds paid on behalf of bondholders to avoid withholding; tax on issuance of capital stock. Special taxes: paving tax.

He declared that if the normal federal income tax should be increased, as is proposed, to say 15 per cent, it would have a serious effect upon the companies. Heretofore they had been but little affected by the federal income tax because of the large proportion of their capital which is made up of bonds. The National Industrial Conference Board had, however, recommended that public utilities should be exempted from increased income tax, but such recommendation had received no consideration by either of the last two Secretaries of the Treasury.

Local taxes, he said, were also becoming more arduous because formerly, with local taxes, a company could argue the merits of its case, but with the present elaborate reports which have to be rendered to the state tax commission and not required from individual property owners, the utility taxes are liable to be higher in proportion to the value of the property than those of other property owners. He urged the companies to appoint a committee on taxation to look up the practice in other states and what proportion of the tax burden other businesses in New York State were bearing. He believed that such a committee would find that the railways were bearing far more than their proportion of taxes. He continued that throughout the state there was a demand for better service, but the companies cannot get money to extend their service if they have to pay anywhere near such taxes as at present. Within the last few years railway taxes have greatly increased not only actually but relatively to gross and net receipts, although the properties often were decreasing in value. This has been the case notably with the so-called paving tax. At one time the cities believed that it was necessary only to pave the main streets. Now, with existing auto traffic it is thought that many more must be paved, and the time will come soon when practically all streets on which there are tracks will be paved. He cited the case of one road near Buffalo which is fighting to take up its tracks to avoid paying for paving two-thirds of a highway which will be used exclusively for automobile competition.

SECRETARY STANTON

In conclusion he urged that so long as the railways remained in their present financial condition, they should give greater attention to accounting statements based on actual receipts and disbursements, instead of confining their attention to operating revenues and expenses, kept as they were on the accrual basis, which, when not considered in connection with other portions of the accounts, often gave an incomplete picture of the financial condition of the property.

In this connection he also urged that the executives and financial officers make a greater effort to educate the operating officials about the financial condition of their property so that the tendencies to demands by municipalities, or recommendations by operating departments for expenditures which the company could not afford, might be more readily checked.

ELECTION OF OFFICERS

At the conclusion of the discussion the following officers were elected:

President, W. O. Wood, president New York & Queens County Traction Company; first vice-president, Benjamin E. Tilton, vice-president and general manager New York State Railways, Syracuse, N. Y.; second vice-president, W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company. Executive committee: W. J. Harvie, general manager Auburn & Syracuse Electric Railroad; E. J. Dickson, vice-president International Railway; A. E. Reynolds, general manager United Traction Company, Albany, and C. E. Morgan, assistant general manager Brooklyn City Railroad.

After his induction as president Mr. Wood expressed an appreciation of the honor of his election and urged that in the future the association could well take into its inner counsels the manufacturing members and those in professional capacities. The meeting then adjourned.

THE BANQUET

The concluding feature of the meeting was the annual banquet, at which President Cherry was toastmaster. He read some "fake" telegrams purporting to come from men prominent nationally, and then introduced Hon. John A. Barhite, formerly Public Service Commissioner for the Second District, New York State.

Judge Barhite said that he was pleased to be able to address unofficially the men whom he had known through his work as commissioner. The public ideas regarding these men, he said, have changed, and the railway manager is coming to be known no longer as one who is "out to do" the public. One trouble with the railways today, however, is their failure to insist fully upon enjoying the rights guaranteed them by the Constitution of the United States. They should devote more attention to explaining to the public what these rights are. The people should understand that the idea that the terms of a public service franchise are forever binding is not necessarily true, as there is a power which can change a franchise when constitutional rights are involved. It is too late, said Judge Barhite, to begin educational work when a crisis has arrived, as it is a process requiring time. There should be a constant effort to explain to the public the legal status of the electric railways.

Judge Barhite was followed by Dr. Willard Scott of Boston. His address covered the general theme of contrasts in various aspects of life and was illustrated with numerous witty anecdotes. The serious purpose of the address was to show that changes are inevitable and not necessarily to be deplored, but the problem for the individual to solve is one of adjustment or adaptation.

RAIN COMPLICATES ENTERTAINMENT PROGRAM

Outdoor sports were interfered with by inclement weather, but golf enthusiasts managed to play between showers, and many "conventionites" stayed over the week end. The ladies were well provided for with card games during the meeting, and an excellent orchestra played for dancing and general entertainment. The singing of the Manhattan Quartet during and after the banquet was greatly appreciated.

One-Man Car in Its Present Relation to Operating and Maintenance Costs*

By W. G. Gove
Superintendent of Equipment Brooklyn Rapid Transit Company

THE electric railway industry, to a greater degree perhaps than was or is the case in any other line of public utility, has since the period immediately preceding our entry into the recent world war been very generally occupied in trying to "make both ends meet." Operating and maintenance costs have mounted by leaps and bounds, taxes have been considerably increased and other burdens added, and only very recently has it seemed as though the "peak" had been reached. We are in general living in a post-war period of price and cost discussion, and although there has recently been a tendency toward lower price levels for materials entering into the maintenance of our properties, it must be kept in mind that as labor is usually a large part of the cost of producing supplies and equipment the process will be slow, as wages can be reduced only gradually. Four or five years ago most maintenance work could be considered upon a basis of 50 per cent labor and 50 per cent material cost. It has now been distorted more nearly to a 75 per cent labor and 25 per cent material basis. It is therefore obvious that the large and most important item is "labor," and it appears that we will have to face a disproportionate cost in this respect for some time to come, especially in localities where there has been no decrease in wages from the high peaks reached in 1920.

"One-man car operation" is a term with which we have become thoroughly familiar within comparatively recent years. The great step forward came through the introduction of the Birney safety car, approximately six years ago. In its production thorough consideration was given to the possibilities of reduced operating costs and with minimum weight consistent with reasonable strength. Its particularly novel feature was in provision for one-man control on a practical basis.

Its pathway of introduction was by no means easy, having been opposed by railway operators because of its diminutive proportions, by platform men through their unions because of the labor-saving qualities, and by the public because it just did not know. This combination of opposition did not apply in every instance, fortunately.

The foresight of those who devised the means of control, commonly called the safety features, contributed probably the greatest single measure to success, for it must be remembered that in the standard safety car we have a single unit with a uniform method of operation which has successfully met the operating conditions on approximately 250 different railway properties. Aside from this, in practically every instance where opposition to such operation was expressed it was on the basis of safety, and with the safety devices in evidence the opposition was overcome.

Another factor for which we are indebted to the manufacturers allied with our industry, rather than to those actually engaged in operation, is the perpetuation of standards in design. Unfortunately there is in evidence among our various properties an inclination to inject into the details of car design and construction too great a reflection of our personal views as gathered from our own property. As a matter of fact, while we are all producing and selling the same thing—street railway transportation—there was, before the advent of the safety car, practically no two lots of cars ever constructed over the same specifications, and in this practice there must have been a direct charge, for which we are responsible, to cover a tremendous range of development. Now there are in service nearly 5,000 safety cars of a single uniform type and the range of service delivered by them comprises cities of population varying from 20,000 to 2,000,000.

As to economies, it is difficult to express the items in the particular manner which might appeal to you individually. The platform saving is obvious. The track maintenance saving is prominently indicated, although I do not recall any figures on the subject. Boarding and alighting accidents are practically eliminated through the novel method of interlocking doors and steps with air brakes. Power costs are greatly reduced. It has been stated that a single safety car means a direct saving of from $1,800 to $2,600 per year, depending on the basis of comparison, and if we may presume an average of $2,000, it will be seen there is already in action a potential saving of $10,000,000 per year in our industry. Taken on any basis, the total will prove imposing.

In regard to the subject of relative sizes of cars necessary, I do not recall a single instance in the studies I have made of this subject where, with suitable track facilities, the standard safety car could not meet traffic requirements. The limit of its capacity may be directly ahead, but certainly it has not yet been attained. With the growing movement at hand looking toward the use of large cars under one-man operation, it will be possible to satisfy, at higher cost, the conditions which prohibit use of the small car.

The same principles of uniformity of equipment and operating methods and the same reasons for safety devices apply to the conversion of double-truck cars. The need is just as great, the human element equally fallible. Until recently the total number of double and single truck cars converted for one-man operation was about 700, but there has been a very decided increase in such activities, particularly in the East, and it is evident this means of effecting economy will expand greatly. I have within the last two weeks noted with particular interest the introduction of the one-man principle into the interurban service operating out of Cincinnati, Ohio, by means of single-end, double-truck cars, seating forty-seven and equipped with all standard safety devices. This operation is reasonably typical of interurban service.

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*Abstract of address at meeting of the New York Electric Railway Association at Lake George, N. Y., June 11, 1921.

Whether the rebuilding of existing cars and using existing motors of the older and heavier types is advisable depends to a great extent upon the length of time such larger cars are required for use. If required throughout the entire day the principal factor to be considered is the amount of power that will be consumed by the rebuilt cars due to their weight and larger motors as compared with new cars of the same capacity. These can no doubt be designed and constructed of considerably less weight per passenger capacity, and when equipped with new motors especially designed for the particular service will have a considerably lower power consumption.

A very few operating companies are advocating and one or two have purchased safety cars with an increased length of platform having both an entrance and an exit door. The number of points where both doors may be used to advantage, however, are so few as to make the excessive cost of construction and increased cost of power due to the added weight seem unwarranted.

The surface lines of the Brooklyn Rapid Transit System have had 206 standard Birney safety cars in operation for a year and a half. These are operated on thirty-five different lines with service varying from shuttle service, where but one car is used, to through lines, where a varying number of cars up to a maximum of twenty-one on a line is used. One of these through lines operates on lower Fulton Street in Brooklyn Borough, which is one of the most congested sections in any city in the country. These cars operate without the slightest difficulty and are interspersed with cars of both larger and heavier types at the present time.

When placing these cars in service the headway was changed on but few lines and on these lines it was shortened. With the use of the safety car fare boxes were placed in service, where on cars previously used fares were collected by the conductors. This has resulted in an increase of revenue, attributed in some cases to less stealing and in others to the fact that no fares are missed. The operators of safety cars in Brooklyn are paid an additional 5 cents an hour, so that the saving in platform costs has been on most lines 50 per cent less.

The general attitude of the public regarding the use of safety cars in New York City has been favorable and the attitude of the operators has also been generally satisfactory. No difficulty has been experienced in maintaining schedules even with the additional duration of the stops caused by the use of the safety car where full stops must always be made for both boarding and alighting passengers, where previously the cars used permitted "flying" stops as they were not fully vestibuled.

I have not given any actual data and statistics as to the weights, speed, power consumption, costs of operating, etc., of the safety car as compared with other types of cars, as no doubt these are known by you, such data having been published in the ELECTRIC RAILWAY JOURNAL and other technical publications as well as having been presented in papers that have been read during the past two or three years at the meetings of various railroad clubs.

In concluding, I wish to make plain that, at least to my way of thinking, the development of the "safety car" and the "one-man" principle has been and is one of the most promising fields for economy in our industry today and that the greatest credit is due to C. O. Birney, whose foresight and courage disregarded past practice and prejudice, and to the Stone & Webster corporation, whose faith in Mr. Birney's judgment and financial backing introduced the car first to compete with the jitney in the West and Southwest and later firmly established the car as a regular institution for general use. I also wish to point out that this is a prominent example of what can be done by active co-operation of the manufacturer, the purchaser and the operator in shaping standardization of design, which I referred to in a talk before this association a year ago. It is obvious that more prompt, complete and economical results in determining standards of design, construction and practice can be obtained for the industry than are obtained from committee work that, after all, merely scratches the ground. Members are prolific with advice for determining what others should do, but are often quick to find reasons why they cannot "practice what they preach."

I earnestly recommend to those intrusted with the operating of our properties, both within this state and elsewhere, the prompt, serious consideration of adopting and extending one-man car operation over their lines and not prejudge such as impracticable.

Development of the Safety Car*

By W. H. BURKE
Stone & Webster, Inc., Boston, Mass.

THE development of the Birney car dates back to the time when the electric railway companies under Stone & Webster management, along with practically every other company in the country, found themselves operating a lot of heavy double-truck cars weighing from 1,000 to 1,500 lb. per seat, and when only half the seats were taken, this meant unit weights of from 2,000 to 3,000 lb. per passenger.

We decided that the companies were losing a great deal of short haul traffic and also longer haul business, which could be secured and profitably handled if it were possible to develop a very light-weight car with which we could afford to operate shorter headways. Then the jitneys came along and the matter was quickly brought to a head.

The first Birney car was a double-end car seating twenty-nine people and weighing 13,000 lb., or only 450 lb. per seat. Since then, a few minor changes in design have been made. The latest design of double-end car seats thirty-two and weighs about 15,300 lb., or 480 lb. per seat. The single-end car weighs 14,500 lb. and seats thirty-five, so that its unit weight is 415 lb. per seat. However, the latest car is the same in substantially all essential details as the first car built.

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*Abstract of address at meeting of the New York Electric Railway Association at Lake George, N. Y., June 11, 1921.

Commercial operation of the Birney car was first started in Fort Worth, Tex., on Nov. 1, 1916. On that date the Northern Texas Traction Company replaced all of the two-man equipment on its Summit Avenue line with Birney cars, ten cars having been purchased for this service. By 1919 there were 1,200 of these cars in use in the United States, and by 1920 nearly 4,000. Today there are upward of 5,000 in use.

To a company contemplating one-man operation, two or three factors are of particular interest. Take first the matter of selecting and training operators. The men picked should be enthusiastic; in other words, they must be sold the one-man idea because they will have more to do than any one else in making the Birney car a success. Other requirements are alertness, adaptability and ability to concentrate. Courtesy is a prime requirement, and the men should have had a good record in two-man service. We have never followed the seniority rule in picking Birney car operators, and our experience has been that it makes little or no difference whether a man has previously been a motorman or a conductor provided he measures up to the requirements mentioned.

Here, briefly, is the plan adopted by one of our companies about a year and a half ago for training platform men, and it has worked out very satisfactorily. This company has about ninety one-man cars, 130 other city cars and forty-five interurban cars. We will assume that the man has come through the preliminaries and is reporting to an instructor to break in. For the first day he observes operation of a Birney car on the instructor's regular run. The next day they take a Birney car out on some outlying line where they won't interfere with traffic, and the student becomes familiar with the mechanical and electrical features, and learns to operate the car in a preliminary way; this covers starting, stopping, getting and keeping the car under control, taking switches, etc. This requires from three to five days.

The student next learns to operate the car on the instructor's run, and then is transferred to two-man tripper service. He first operates on the same end with the instructor and later operates each end with the instructor taking the other end. This continues until he has covered practically every city line. In this way he learns the various schedules, streets, transfer points, etc., and in fact gets a good idea of the system as a whole. Then he is O.K.'d for work, but the instructor still keeps in touch with him and helps him in every way possible.

The average breaking-in time under this plan has been 210 hours, the longest being 355 hours and the shortest 135. Under the plan formerly in force, the average time was a third longer and the man was not instructed nearly as completely as he is now. As for the older men, motormen and conductors, the company devoted two weeks last summer to breaking them in on Birney cars. Not one was disqualified by his instructor, and in only two or three cases did they quit of their own accord. This means that every platform man in this company's employ is a three-way man: he can operate a Birney car and either end of a two-man car and can do it on any line in the city. Furthermore, the matter of runs and the extra list problem are greatly simplified, and only one regular and one extra board are required for the city service.

The highest type of supervision and instruction is necessary in introducing the one-man operation, and the shop force should be instructed in maintaining the safety equipment. Usually a representative of the manufacturers will attend to this if desired. And here I want to say a word of appreciation of Mr. Beck of the Westinghouse Company and Mr. Thirlwall of the General Electric Company. They have contributed greatly to the success of the Birney car, and the industry owes them a unanimous vote of thanks.

As to the introduction of the car to the public, it is important, of course, to start it off with its best foot forward. Neither the public nor labor should get the idea that the company wants to hog all the advantages. Our companies have always shared the savings with the man through somewhat higher wages, and with the public in the way of better service.

We have never made it a practice to start one-man operation with anything but new cars of the standard Birney type. We feel that the service should be materially improved at first, except possibly in the largest cities on lines where the headways are already very short. Too much service is better than too little for a time, because it is service more than anything else that sells the car to the public. Above all, the Birney car should not be regularly overloaded. If it is, the public gets the idea that the company isn't "toting fair," and this causes dissatisfaction.

There was some labor opposition in the early days, because the men had the idea that the introduction of the Birney car meant that half of them would lose their jobs. It doesn't work out this way, of course, because the increased number of Birneys operated and the normal labor turnover will usually take care of this. In fact, I don't know of a single case where any of our companies has been forced arbitrarily to discharge any men as the result of one-man operation.

The psychology of the local public is a factor in introducing the car, and possible objections should be anticipated and met in advance as far as possible. We have found newspaper advertising of value, but believe it should be concentrated into two or three days before operation is begun. Otherwise, if there are any dissenters, it gives them just so much more time to formulate objections. Once the car is properly introduced it is its own best advertisement, and, practically without exception, we have found the press comments favorable. Some of the press comment is usually along humorous lines, and that helps, because so long as you can keep the public laughing you won't have much trouble.

As to the economics of the Birney car, the savings are very substantial. Without exception, I believe, we have found that with shorter headways earnings have shown a very substantial increase. Here are a few typical cases of the relation between increased earnings and increased mileage for a few of our companies:

	Per Cent Increase in Mileage	Per Cent Increase in Earnings
Tampa—one line	29	13
Tampa—one line	51	51
El Paso—one line	48	50
El Paso—one line	40	36
Houston (heavy jitney competition)	70	40
Tacoma—one line	20	25
Tacoma—one line	75	42
Tacoma—one line	3	17

We feel that it is very conservative to assume an increase in earnings and mileage at the ratio of 1:2, that is, with 30 per cent more mileage we will get 15 per cent more gross. No increase would be expected, of course, where headways are two or three minutes with two-man cars and, therefore, short enough to get all the business there is.

The most obvious savings in expense are in platform labor and power. There is also a saving in maintenance, but until the Birney car is older it is impossible to say definitely what it will be in the long run.

There is a marked reduction in accidents in substantially all cases; step accidents are virtually eliminated. An analysis of our companies for the first five months of 1920 show the following results:

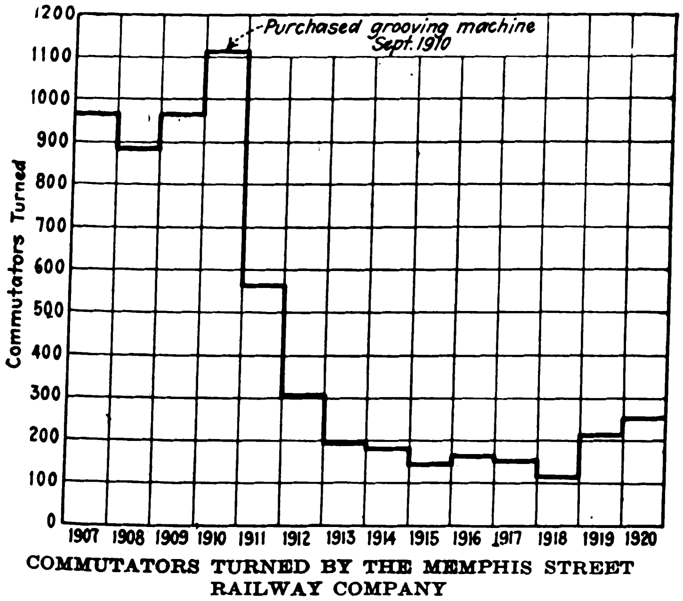
	One-Man	Two-Man
Car-miles operated per accident	18,100	10,800
Passengers carried per accident	88,700	73,800
Paid out in settlements for each 1,000 car-miles operated	$10.60	$15.00

As a broad proposition I think you can figure conservatively on a saving of not less than $2,500 per car per year with Birneys on a car for car exchange, and with a third more service, and the increased earnings which result the saving in net is around $3,500 per year for each Birney car purchased.

As regards the remodeling of existing equipment, we are now operating 100 rebuilt cars, quite a percentage being double truck. With Birney operation well established, we have found no objections on the part of any one to the use of rebuilt cars, and we feel that the operation of double-truck one-man cars has tremendous possibilities. After all, the step from single- to double-truck one-man operation is not as radical as the original change from two-man to Birney cars. In general, we believe that no valid objection can be raised to rebuilding double-truck cars for one-man operation if safety devices which are standard for the Birney car are used.

Slotting Increases Life of Commutators

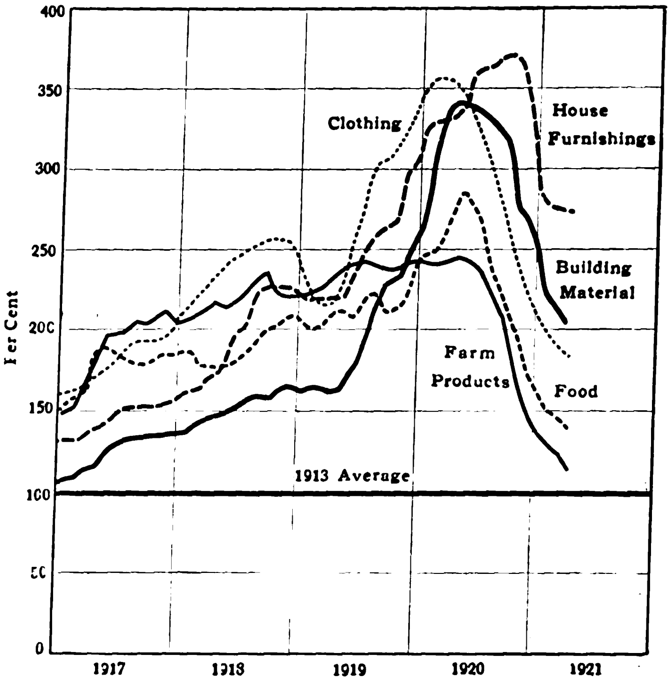
THE effect of commutator slotting in reducing the number that it is necessary to turn for flat spots, rough surfaces, etc., is very forecfully illustrated by the accompanying graph showing the number of commutators turned by the Memphis Street Railway Company. This company purchased a General Electric Company's commutator slotter in 1911 and began the work of slotting the commutators of all armatures. During the year 1911, 1,115 commutators were turned. The sudden drop in the graph after this year is very noticeable and in the year 1918 but 115 commutators were turned.



COMMUTATORS TURNED BY THE MEMPHIS STREET RAILWAY COMPANY

Cost of Living Chart

THE monthly review of the Federal Reserve Bank of New York for June 1 presents a series of interesting charts of prices, including the one reproduced, which shows wholesale prices of certain groups of commodities in the United States, expressed in percentages of the average figures for 1913. Another chart shows wholesale commodity prices in the United States and England from 1790 to date. The United States figures have three peaks, namely, about 1814, 1865 and 1920, all approximately the same height.



WHOLESALE PRICES OF CERTAIN GROUPS OF COMMODITIES IN THE UNITED STATES EXPRESSED AS PERCENTAGE OF THE AVERAGE FIGURES FOR 1913

Retail Prices of Foodstuffs Still Falling

THE United States Department of Labor through the Bureau of Labor Statistics has given out the changes in retail prices of food in nine principal cities of the United States. These changes are based on the prices of forty-three articles of food. During the month ended May 15, 1921, the retail cost of food in Bridgeport decreased 3 per cent; in Newark, 6 per cent; in New Haven, 5 per cent; in New York, 4 per cent; in Norfolk, 4 per cent; in Philadelphia, 5 per cent; in Providence, 3 per cent; in St. Paul, 8 per cent; and in Washington, 5 per cent.

For the year ended May 15, 1921, the decrease was 29 per cent in Bridgeport; 30 per cent in Newark; 31 per cent in New Haven; 29 per cent in New York; 30 per cent in Norfolk; 32 per cent in Philadelphia; 30 per cent in Providence; 37 per cent in St. Paul; and 29 per cent in Washington. For the eight-year period May 15, 1913, to May 15, 1921, the retail cost of food shows an increase of 39 per cent in Newark; 43 per cent in New Haven; 49 per cent in New York; 51 per cent in Providence; 44 per cent in Philadelphia; and 53 per cent in Washington.

The Bureau of Standards has recently issued its miscellaneous publication No. 46, describing the war work the Bureau of Standards.

Trackless Trolley Tested at Schenectady

Successful Demonstration of First Vehicle Built for the Virginia Railway & Power Company—Bus Has Seating Capacity Equivalent to the One-Man Safety Car

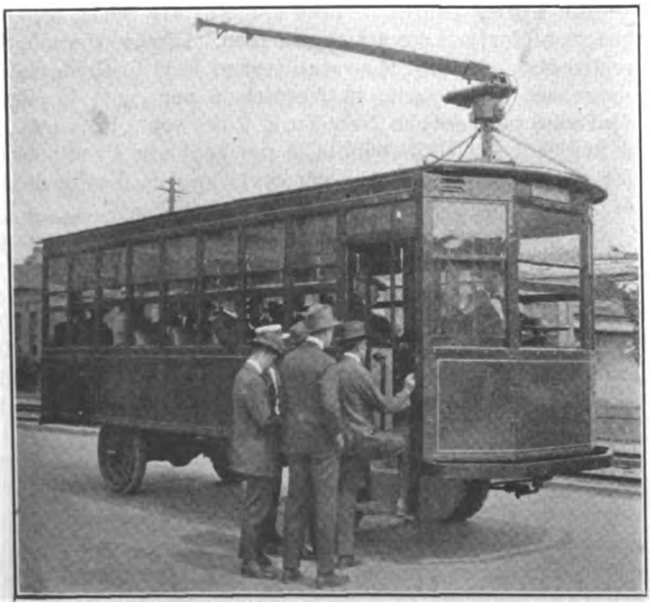
A DEMONSTRATION of the trackless trolley bus was given June 15 at the Schenectady plant of the General Electric Company, where a two-wire overhead system for the operation of this type of car was strung up over a route of about ½ mile. There were more than one hundred railway officials present to witness and participate in the demonstration, which caused much comment. The "Trollibus" operated throughout the day over a highway route having several kinds of paving, namely, brick, macadam and ordinary dirt and cinder road. The tests were declared in every respect successful. After the morning demonstration the party adjourned to the Mohawk Club, where a buffet luncheon was served.

The trackless trolley bus resembles in general size and appearance the present one-man single-truck safety car and seats thirty passengers. The equipment consists of a single railway motor and a controller arranged for foot operation. Two overhead wires on 14-in. centers supply the current, which is taken into the car by a sliding type collector, maneuvered by the motorman from his seat, and allows a leeway of 18 ft., or 9 ft. on each side, for passing other vehicles.

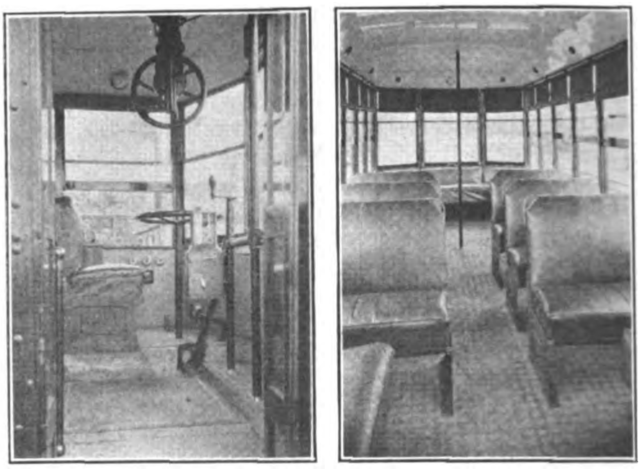
This arrangement allows two cars to operate in opposite directions on the same wire; on meeting, the operator can swing off to the side, disengage the collector or trolley pole and, after the other car has passed, can reconnect it with the trolley wire and proceed.

When running over the track area of the system; that is, in returning to the carhouse, the trolley bus is equipped with an adapter on the collector for connection with the standard overhead trolley wire and a shoe which fits into the track groove, thus giving the necessary ground connection.

The chief advantage of the trackless over the regular trolley system is the low initial capital investment. To install a single-track trolley line on an unpaved street costs about $35,000 per mile. On a paved street, where the railway company is forced to pay for the pavement between the rails and 2 ft. outside, the cost jumps to $75,000 per mile. The overhead trolley distribution system for a single trolley line costs approximately $4,500 per mile, and where a double set of trolley wires is strung the cost will be about $5,500 per mile.



GENERAL VIEW OF TROLLEY BUS, MOUNTED ON SOLID RUBBER CATERPILLAR TIRES



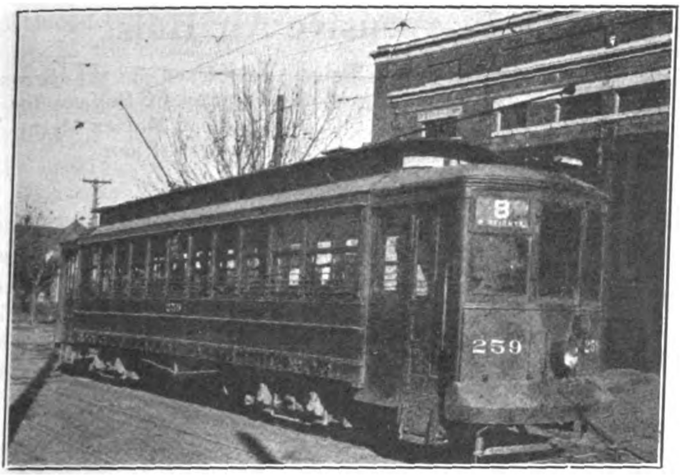
AT LEFT, OPERATOR'S COMPARTMENT, SHOWING OPERATING AND TROLLEY CONTROL MECHANISM; AT RIGHT, INTERIOR OF TROLLEY BUS, SHOWING SEATING ARRANGEMENT AND FINISH

As compared with the gasoline-driven motor bus the operating and maintenance cost is said to be much cheaper. From the standpoint of the rider, it is also claimed, it provides a service of equal reliability and comfort, and in many cases the operation is faster and smoother, especially where the streets are well paved and maintained. According to statistics given out by the General Electric Company, that portion of operating costs for gasoline and lubricating oil of the motor bus averages 5 cents per mile, whereas with the trackless trolley the cost of electricity is but 2 cents a mile. The maintenance of equipment, including tires, averages 9.5 cents per mile for the motor bus, as compared with 4 cents for the trackless trolley. Depreciation on the gasoline bus averages 3.4 cents per mile as compared with 1.9 cents for the trackless trolley. The saving in favor of the trackless trolley is therefore 10 cents per bus-mile. Figuring that the average bus runs 33,000 miles per year, this means a saving of $3,300. The first cost of a trackless trolley installation is higher than a gasoline bus, due to the overhead construction required. Interest, depreciation and taxes on this investment reduces the annual savings from $3,300 to from $2,500 to $2,700 per bus in service.

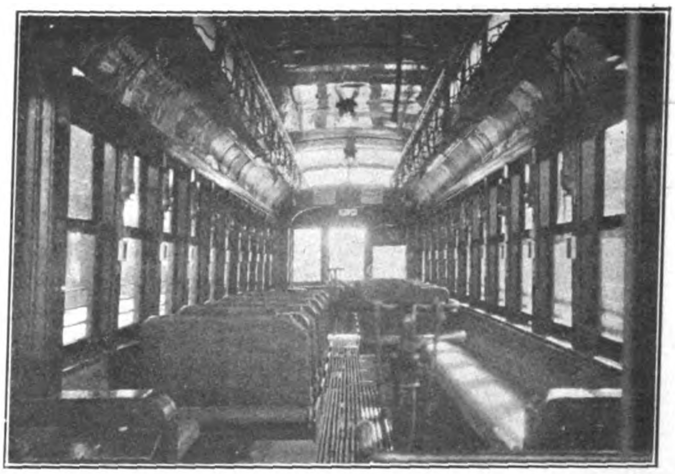
Following the tests at Schenectady a large installation is expected at Richmond, Va. Installations are also expected to be made at Staten Island, New York, Buffalo, N. Y., and other cities.

Trackless trolley cars have been in successful operation in some European countries for several years. One hundred miles of trackless system is in use in England, and in Italy several companies are operating over 40 miles of route.

Cars of this type are not new to the United States, but at present none is, so far as can be learned, in use. The general purpose of this car is not to supplant or take the place of the ordinary rail system for the business districts or thickly settled sections of a city, but to make it possible to operate trolley cars in suburban sections where the cost of laying and maintaining rails and ties would make the extension of lines impracticable.



EXTERIOR VIEW OF REBUILT CAR



INTERIOR OF CAR, SHOWING SEATING ARRANGEMENT

Little Rock Joins in Rebuilding Cars

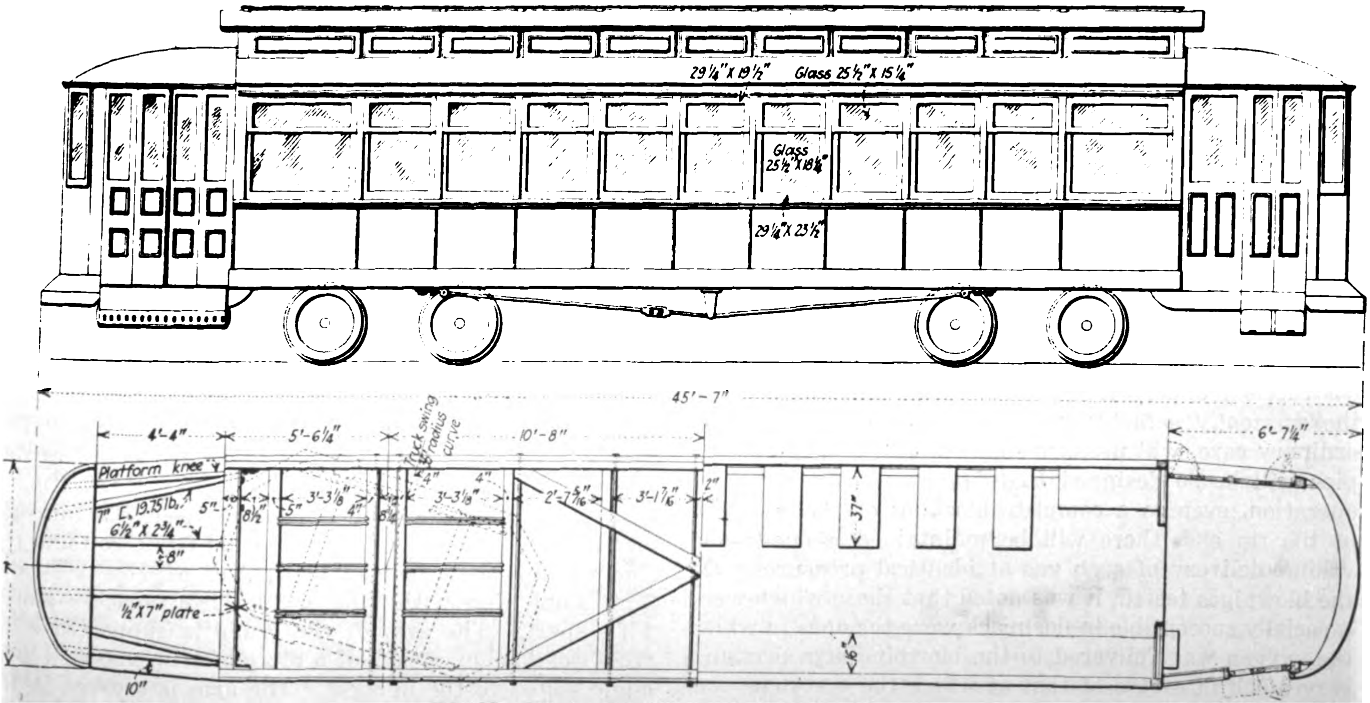
Old Summer Cars Are Made Available for All-Year Round Service—Increased Safety of Inclosed Cars Is a Factor Entering Into the Decision to Rebuild

THE Little Rock Railway & Electric Company has joined the movement of inclosing some of its summer cars in order to make them available for all-year round service. While some railway men who live in northern climes probably imagine that Arkansas is in the sunny South, where open cars may be used eight or nine months a year, the fact is that four months' service is about all that can be obtained from open equipment in that part of the country. Also, the Little Rock Railway & Electric Company has on an intensive and continuous safety campaign and it was decided that closed cars were very much safer than open cars; this was one element which entered into the decision to inclose some of these cars.

The cars which were chosen to be rebuilt were six fourteen-bench side running board cars which had been on hand for some time. Everything above the floor level was torn out except the sills and roof. The cars were cut off at the corner posts and new platforms were put on; these were 6-ft. platforms, drop extension. An accompanying illustration shows the supporting structure for these platforms. The old posts were built up by the addition of necessary strips to take care of windows and inside finish. The windows were arranged to raise and not to lower; that is, the window of the type usual on railroad coaches was designed and built in the shop of the company.

The original cars seated seventy on the fourteen cross benches. The present car seats forty-eight only. The body was too narrow to put full cross seats on both sides, so a seating arrangement using both cross seats and longitudinal seats was adopted, as shown in the accompanying illustrations. The longitudinal seats were built in the shops of the company, but Hale & Kilburn cross seats were purchased and used. The cars were completely curtained by the Curtain Supply Company.

The original floor in the car was left, with the strips removed, and a 4-in. pine floor laid on top of the old. Strips were placed in the aisle as usual. Twenty-gage galvanized iron was used to line the car below the window sill. Sheet iron was used on the outside. The entire car, both inside and outside, is enameled. The



PLAN AND ELEVATION OF REBUILT CAR

Little Rock Railway & Electric Company has decided that enamel is the thing to use as it lasts satisfactorily in that part of the country for three years, takes less time to apply and gives general satisfaction. The experience with paint and varnish there has shown that varnish must be applied annually to keep up the finish. As a matter of fact, it is figured that there is a 50 per cent saving in painting by the use of enamel over the ordinary paint and varnish. The color used is yellow, which has superseded the former pullman green of the company which was found to change to black after a short time in service.

The cars are equipped with four GE-57 motors, K-35 control, and Brill 27-G 1 trucks. Ohio brass air sanders were added as equipment to the car, as was also Ohio brass air brake equipment. National pneumatic doors and steps are used, manually operated. It was necessary, in order to provide the required room on the platform, to provide the hand brakes with folding handles, which were obtained from the Dayton Manufacturing Company. Ten heaters, arranged on two circuits, were installed in each car. The heaters used were No. 192 manufactured by the Consolidated Car Heating Company.

These cars were 42 ft. 8 in. long originally, and as rebuilt are 45 ft. 7 in. long.

The total cost of rebuilding these cars per car was $3,000. This work was done between Sept. 15, 1920, and Jan. 15, 1921.

Characteristics of Oxyacetylene Welding and Cutting Blowpipes

THE result of an elaborate series of tests tried out by R. F. Johnston, engineer-physicist, U. S. Bureau of Standards, Washington, D. C., for the War Department on commercial apparatus for cutting and welding by the oxyacetylene process form the basis of an article in the May issue of *Mechanical Engineering*. The tests were conducted for the War Department on apparatus submitted by manufacturers for that purpose.

The general conclusions from the tests were that there was a great deal of difference between the characteristics of different designs of cutting blowpipes and that there was no make of apparatus which was equally proficient and economical for all thicknesses of metal. Further, one of the prime essentials of a good welding blowpipe is its so-called gas ratio, which should be unity. Not any of the blowpipes tested proved capable of maintaining a gas ratio of unity during welding, although the welds were probably made with greater care than is usually exercised when such work is being done.

The important problem of "flashback" received extensive consideration. A blowpipe designed to be absolutely free from flashback caused by any form of obstruction, under all working conditions, will also be the eminently safe blowpipe and the one which, with ordinary care, will produce sound welds. Such a blowpipe will be so designed that, under all conditions of operation, even to a complete blocking of the gas exit at the tip end, there will be maintained a one-to-one volume delivery of each gas at identical pressures. Of the blowpipes tested, it was noted that those which were especially susceptible to flashback were the ones in which the oxygen was delivered to the blowpipe at a pressure very much in excess of that at which the acetylene was delivered.

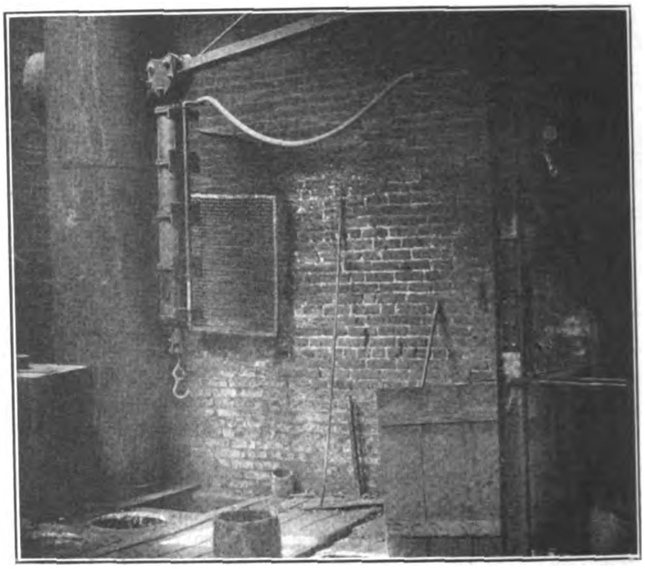
An Inexpensive Air Hoist

Discarded 7-In. Brake Cylinders Are Used in the Brass Foundry of the Union Traction Company of Indiana for Constructing a Hoist to Lift Crucibles of Molten Metal from the Furnace to the Foundry Floor

By J. E. Hester

Master Mechanic Union Traction Company of Indiana

THE accompanying illustration shows an air hoist constructed of four 7-in. brake cylinders and other second-hand material taken from used material stock and from the scrap pile. This is in use in the brass foundry of the Union Traction Company of Indiana and is used for handling molten metal from the furnace to the molds. In constructing this hoist the brake cylinders were lined up by fitting soft wood blocks into the ends of the cylinders. The wood blocks were 7 in. in diameter, 2 in. thick and were slightly tapered from the center to both ends. A 3-in. hole was bored in the center of the blocks to facilitate their removal after lining up and before the heads were put in place. The cylinders are bolted together with four ½-in. rods threaded at both ends to receive the necessary nuts; 3/16-in. sheet asbestos was used as gaskets at the joints between the cylinders, and to guard against the cylinders getting out of line the joints were welded with an oxyacetylene torch. The pressure head used consisted of an old discarded steam cylinder head, which was machined to fit the lower end of the cylinder. This was provided with a stuffing box and the packing gland was made from an old discarded gland.



HOME-MADE AIR HOIST

The piston consists of a head threaded to receive the lifting rod which extends through the piston and is fastened with a 1½-in. nut, which takes the strain and prevents the stripping of the threads in the head. The lifting hook used was secured from an old discarded pair of chain falls.

In the construction of the crane itself the upright member was made from a piece of old 60-lb. rail and the arm was made by bolting two pieces of ¼-in. x 3-in. x 3-in. angle iron with ¾-in. x 2-in. iron spacers placed 1 ft. apart. The arm of the crane is supported 8 ft. from the floor by means of a piece of ¼-in. x 4-in. x 4-in. angle bolted to the upright. The arm is trussed to the top of the upright member by a ¾-in. rod, which is provided with a turnbuckle. The pivot bearing at the base of the crane was made from an old discarded car center bearing, the flanges of the male portion being machined off and riveted to the upright member by means of two angle irons and the female member of the bearing being bolted to the foundry floor.

The traveler which carries the hoist consists of two sides with pins from old motor suspension bolts. The wheels used were old coal conveyor wheels bored out and babbitted where they bear on the pins.

The air used to operate the hoist is secured from a Westinghouse steam-driven air compressor located in the central power station near the shops. The air line is connected to the hoist by means of a ¾-in. hose which allows the hoist to be moved the entire length of the crane arm. The air is controlled by a two-way valve.

A New Theory of Rail Corrugation

IN RECENT issues of *Verkehrstechnik*, published in Berlin, Germany, appeared an extended article by A. Wichert of Mannheim on the subject of rail corrugation. In this he describes and discusses a new theory which he has evolved and tested experimentally. Before doing so he summarizes the theories which he found in the literature on the subject as follows: (1) The development of corrugation is favored by lack of homogeneity in the rail material due to irregularities in the rolling process; (2) corrugations are hammered into the rails under the action of rhythmical jumping of the wheels; (3) corrugations are caused by vertical vibrations of the rail; (4) corrugations are caused by "sliding vibrations" of the wheels, dampened by friction, which occur within certain critical speeds.

The new theory is based upon the setting up of "friction vibrations" which are of frequent occurrence in daily life. The action of a violin string under the bow, the creaking of a door, the sound caused by rubbing a finger along a wet window pane, the squeaking noise of wheels in a curve or of brake shoes on wheels, all involve noises caused by vibrations, due to rhythmical change in coefficient of friction. According to Mr. Wichert's theory, corrugation of rails is due to these vibrations set up under sliding of the wheels on the rails, involving change in friction coefficient, which is maximum when two surfaces in contact are at rest with respect to each other and falls off rapidly as they move with respect to each other. A factor is also the elasticity of the car axle, which acts like a spring.

Mr. Wichert explains that under actual conditions friction vibration will occur only when the wheels are sliding, as, for example, when a heavy train is starting, during braking, when a car is on a curve, etc. At the points where the wheels slide, a crowding of the material of the rail takes place, followed by the ordinary wear due to rolling. This causes a rhythmical change in the surface of the rail. Tests have, in Mr. Wichert's opinion, proved that the crests of the corrugation are considerably harder than the depressions.

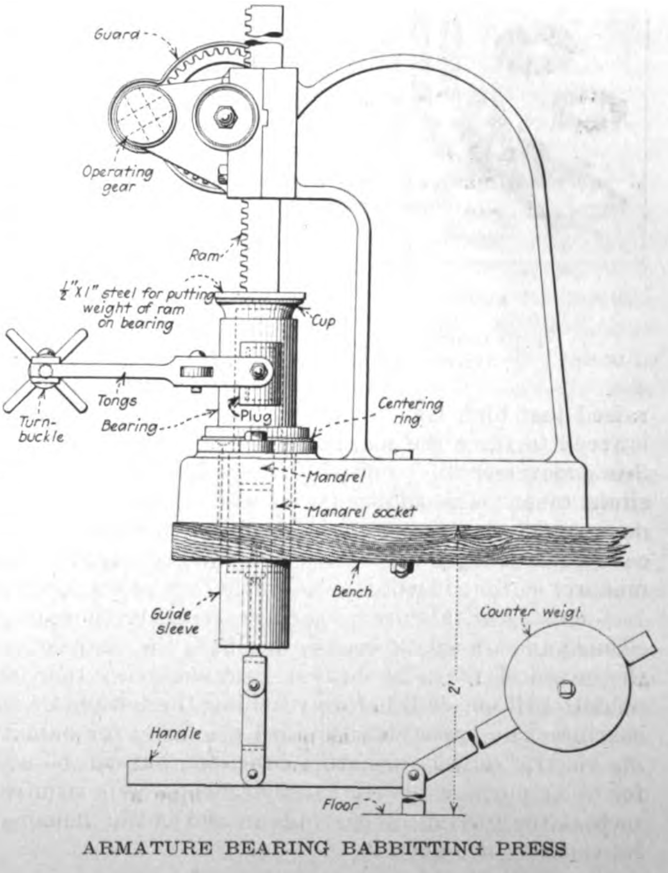
The lower and upper limits of speed at which corrugations are liable to be formed are respectively about 7½ and 17½ m.p.h. If it were possible to determine the factors controlling the speed limits, it should be possible to alter them by modifying the fctors. Mr. Wichert therefore takes up the matter of preventing rail corrugation. According to his theory the upper speed limit is set by the cessation of rhythmical gliding. If, therefore, an absolutely rigid, non-elastic axle were used, the upper limit would be at zero speed. Obviously then increase in diameter of axle should prevent friction vibrations and corrugations. Calculations and experiments show that axles 4.75 in. for a gage of 39.4 in. (1 meter), and 5.5 in. for standard gage should materially reduce the formation of corrugations. An elastic bedding of rails and ties is another safe way to cut down the possibility of developing friction vibrations. Experience has proved, Mr. Wichert says, that concreted tracks have a tendency to develop corrugations on account of their rigid foundation.

Mr. Wichert was able to check his theory experimentally by means of a special testing machine with which rail corrugations could be produced at will. It consisted of two axles, with wheels, mounted one above the other. The wheels of the upper pair were of the standard flanged type and were driven by a railway motor. The lower set, representing the rails, had special tires of rail cross-section. The lower wheels were pressed against the upper and rotated by friction with the latter. By means of levers, weights and springs the two sets of wheels could be pressed together and driven in a manner to imitate actual running road conditions.

New Armature Bearing Babbitting Press

ACCOMPANYING illustrations show a new type of armature bearing babbitting press, which is being marketed by the Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y. This press is a modification of the well known type of arbor press used in machine shops quite generally, differing only in that it is geared for a ratio of 3½ to 1 in order to provide increased pressure necessary for this particular purpose.

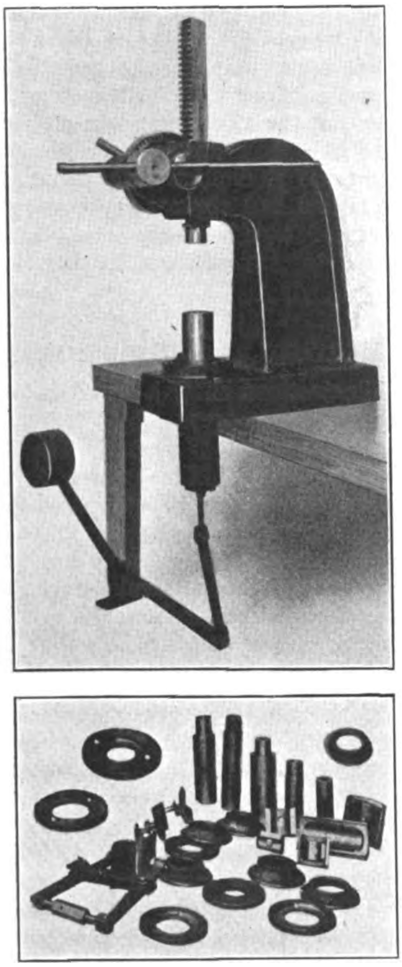
Some of the advantages which result from the use of this press in babbitting armature bearings are that as the mandrels, centering rings, pouring cups and other



ARMATURE BEARING BABBITTING PRESS

devices necessary in babbitting are a part of this machine, much time and labor are saved in that the bearing is the only part which requires handling. The press and the mold are combined, so that the babbitt lining can be poured into the small space between the mandrel and the bearing with more accuracy than with the usual hand method.

The various operations necessary in babbitting an armature bearing with the aid of this press consist of putting the mandrel in its lowered position and the bearing in place in the centering ring, with the flanged end down. The mandrel can then be raised until stopped by the shoulder of the mandrel socket. The cup, really a pouring funnel, provided to facilitate the pouring, can then be placed on top of the bearing. A strip of steel approximately ½ in. x 1¼ in. should then be laid across the top edge of the cup and the ram brought down on this with light pressure on the handle bar. The plugs for closing the openings or windows in the bearing form a part of the tongs used for handling the bearing. These can be quickly placed in position and insure that the opening will be clean and smooth so as to require no further attention after the bearing is poured. After the babbitt lining has been poured in the space between the mandrel and the bearing, the ram is raised just high enough to remove the cup and then is lowered to force the mandrel down until free. A 2 or 3-in. movement is sufficient as the mandrel has a slight taper. The additional movement required can be done rapidly by means of the counterweight lever. The counterweight provided overbalances the weight of the mandrel so that it will stay normally in the up position. In the using of this press bearings should be thoroughly cleaned and tinned, of course, and both the bearing and the mandrel must be heated sufficiently so that the babbitt will not chill before reaching the bottom of the bearing. The press was designed primarily for babbitting electric railway armature bearings, but can be used for other purposes where considerable force is required, such as the forcing of bearings in and out of housings. Its capacity is 12,000 lb.



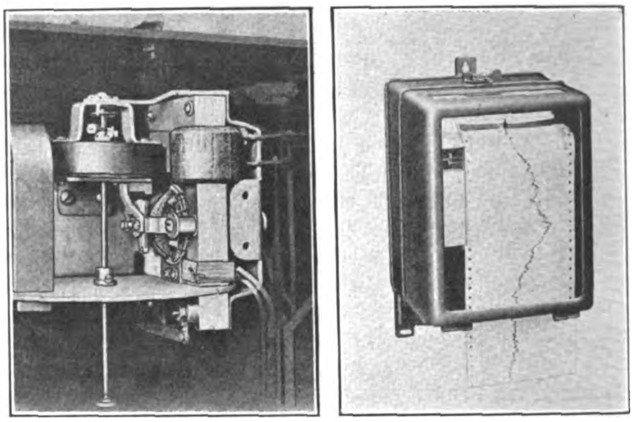
PRESS IN POSITION WITH THE VARIOUS DETAIL PARTS PROVIDED WITH THE OUTFIT

New Kilovolt-Ampere Meter

AN INSTRUMENT of the induction type, for measuring kilovolt-amperes, has been put on the market by the Esterline-Angus Company, Indianapolis, Ind. The instrument will ultimately be available in graphic, integrating, indicating and interval-demand types, but the graphic type has been developed first.

The measuring element of the new instrument is about the size of the element of a polyphase wattmeter. Each single-phase element consists of a pair of laminated poles carrying exciting windings, between which is pivoted a small armature. The armature maintains a fixed phase relation between the voltage windings.

The scale is uniformly divided throughout, and the instrument is said to be equally accurate throughout the entire range of power factor from unity to zero, either leading or lagging current. The meter records the true kilovolt-amperes of the circuit, regardless of the degree of unbalance. The three-phase instrument indicates the sum of the products of current per phase times corresponding voltage to neutral, which is the true kilovolt-amperes of a three-phase circuit.



NEW GRAPHIC KILOVOLT-AMPERE DEMAND METER—MEASURING ELEMENT OF KILOVOLT-AMPERES DEMAND METER

New Type Hand Brake

THE Minich Railway Appliance Corporation, Philadelphia, Pa., is marketing the Super-Safety Hand Brake, which consists of a vertical staff supported by a special cage. This cage is threaded to fit a nut supported by slots in this cage, so that it will move vertically. There are lugs on opposite sides of the nut which operate a U-shaped lever. A connection bar which takes the place of the usual brake chain is attached to this lever and to the brake rod. Round lugs are provided on opposite sides of the cage as a fulcrum for the U lever, so that when the staff is revolved and the nut raised the lever will revolve on these lugs and thus pull up and apply the brakes.

The fulcrum of the U lever is changed gradually as the brakes are applied, so that the power is comparatively low at the beginning, permitting the slack to be taken up quickly, but is increased toward the end of the application. Pawls are unnecessary to keep the brake applied. Some of the advantages claimed for this type of brake are that the ratchet wheel, plate, pawl, brake chain, staff, yoke and similar parts are eliminated, and as all stresses on the staff are vertical, this can be made shorter and lighter.

Letter to the Editors

"Get the Young Engineer While the Getting Is Good"

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURGH, PA., June 11, 1921.

To the Editors:

The editorial which appeared in the ELECTRIC RAILWAY JOURNAL on June 4, 1921, under the caption of "Get the Young Engineer While the Getting Is Good," together with the article on page 1041 entitled "Master Mechanic Proves His Worth," aroused a great deal of appreciative interest among engineers here who are interested in the development and progress of electric traction.

It is becoming quite generally recognized that there are two especially important positions on the operating staff of each reasonably sized street railway company. They are that of the master mechanic, who has charge of maintenance and upkeep of rolling stock, and that of the transportation man, who is in charge of making up and planning schedules. Either one of these men is in a position, to use the slang of the street, to make or break the railroad, assuming that other managerial problems are solved to a reasonable degree.

The article on page 1041, which demonstrates that a master mechanic proves his worth, in reality proves a very old saying, namely, "As the boss is, so are the men." If the boss is a good mechanic and instinctively is satisfied only with good mechanical workmanship, is naturally tidy and orderly in his habits and knows how to encourage and get the best out of men working with him, naturally he will keep the cars and equipment in reliable working condition at the same or lower cost than the man who is not.

To a great many men who have been in a position to observe the operating and maintenance positions as they exist and who have tried to analyze the causes and reasons why cars and equipment are not maintained better, irrespective of the pressure and necessity for reduced costs and limited pay rolls, etc., the answer seems to lie in the lack of appreciation on the part of many administrative officers of the importance and economy of paying the right kind of a salary to attract the right kind of a master mechanic. Another reason is that the industry as a whole has so neglected this phase of its problem that men have not been developed very rapidly and, as a result, very few men are available who measure up to the job of master mechanic. Another reason, perhaps, is the general lack of interest on the part of administrative officers in the matter of encouragement and personal attention to the master mechanics, the repair shop and its problems. It is in only a small percentage of street railways that the administrative officers have shown the proper interest in the shop and its problems by making frequent visits, by holding conferences with the master mechanic and considering him an important officer in the organization. There are a great many properties where the master mechanic is not called in to attend the weekly or monthly conferences of the operating staff and, as a result, there is frequently a wide difference of opinion between the transportation department and the mechanical department which results in friction, lack of co-operation, etc.

This, of course, is not true on the well-managed and well-conducted properties. It might be stated that the apparent attitude of mind toward maintenance of equipment in general on the part of many executives is about the same as it used to be a few years ago on the matter of publicity, the development of favorable public opinion, etc. The latter, however, happy to say, has undergone a decided change. Today, without doubt, there is not an administrative officer on any railway who is not alive to the necessity and importance of proper organization to handle publicity continually for the purpose of developing public good will not only among the people in the community served but also among the employees. It seems, therefore, only necessary to continue the good work you are doing in the pages of the ELECTRIC RAILWAY JOURNAL toward arousing proper interest in the matter of engineering analyses and better mechanical workmanship and general maintenance of railway equipment because, after all, there is no factor so great as that of reliable and regular service with properly maintained cars and equipment in developing and maintaining the good will of the public. Large sums spent on publicity and literature will be rendered void and negative if they are not backed up by reliable and decent service, which your article on the "master mechanic" proves can be accomplished with the right man in charge of this work.

Recently a very prominent manufacturing engineer was discussing the matter of greater refinement in the mechanical construction of locomotives, taking the position that you could not get American maintenance staffs to follow the same degree of accuracy in workmanship and maintenance as that which obtains on many European properties. In order to prove this point he asked the question, "Why is it that although every master mechanic and operating officer on electric railways knows positively that if axles, axle caps and axle bearings and housings on railway motors were properly maintained the cars would make less noise by proper maintenance of gear centers, wear and tear on gears would be appreciably less and the vibration would be reduced to a marked degree and, finally, the maintenance of the entire car and equipment would be appreciably lower, yet there are only one or two roads in the whole United States that actually do this?" It was quite difficult to answer this question. The apparent reason seems to be that they have not had any definite example proving that this is so and in the absence of the necessary spare equipment in many cases have not been able to get the cars necessary to carry out such work. Furthermore, in most cases the master mechanic is not provided with a staff capable of making any such analyses.

This brings us up to the editorial which you have written, which suggests that they get the young engineer while the getting is good. This suggestion is very timely and a very important one.

It is very encouraging to note that quite a number of young engineers who became available for such work as a result of the industrial depression have been taken over by the progressive railway operators. It is further very encouraging to have been able to see one or two reports made by these young engineers showing the errors in maintenance and upkeep that they have discovered during the first month or two of their experience. It was quite clear that the one or two things that they had already discovered would more than pay for their expense during the entire year.

As previously mentioned, it seems only necessary to agitate this subject sufficiently until all railway operators become impressed with the great value and necessity of having a well trained, technically educated—either self-educated or from college—man as a member of their operating and maintenance staff. The title of "efficiency engineer" is taboo. Most railways have called them "transportation engineers" or "equipment engineers." But their job is the important thing. It is to study transportation schedules, etc., from an engineering point of view and also to study the cars and equipment or the tools the railroad has to provide such schedules and service, making analyses each day of operating costs and time-table costs and making suggestions each month in writing to the manager of the property.

It will, of course, be necessary for the operating managers to be somewhat indulgent with these engineers for a time and go to the necessary expense to make certain tests. For example, on the question of value of maintenance of gear centers, axle bearings, etc., several cars on a given line should be specially equipped for test and then operating records should be kept for six or seven months in order to prove the value of such maintenance practice. Again, consider the matter of dipping and baking armatures and field coils. This was first introduced several years ago, but it took time to convince a great many that the expense necessary to carry this out was justified. Today there is hardly an up-to-date road that is not following this practice.

There are actually a thousand and one things of an engineering nature that can be carried out on each road which, when once established, will save thousands of dollars annually and, above all, provide better and more reliable service to the public. This, after all, is the very best publicity in which a railway operating company can indulge.

MYLES B. LAMBERT,
Manager Railway Department.

Association News

Report of Equipment Committee Put Into Shape

A TWO-DAY session of the equipment committee of the Engineering Association was held at the association headquarters in New York City, June 13 and 14. The various subcommittees presented final reports with recommendations for consideration and discussion and various details were decided for including in the final report of the committee. Those present were Daniel Durie, West Penn Railways, chairman; W. S. Adams, J. G. Brill Company; R. H. Dalgleish, Capital Traction Company; James C. C. Holding, Midvale Steel & Ordnance Company; H. A. Johnson, Metropolitan West Side Elevated Railway; T. R. Langan, Westinghouse Electric & Manufacturing Company; C. N. Pittenger, the Steubenville, East Liverpool & Beaver Valley Traction Company; E. D. Priest, General Electric Company; C. F. Scott, General Electric Company; K. A. Simmon, Westinghouse Electric & Manufacturing Company, and C. W. Squier, ELECTRIC RAILWAY JOURNAL. The committee will report on twelve subjects and already a large amount of work has been accomplished.

Schedule Committee Meets

THERE was a well-attended meeting of the joint committee on the economics of schedules at association headquarters on Wednesday, June 15. The reports of three special committees were submitted and approved. The first, covering the definition of man-hours and car-hours, was presented by Mr. Stoll; the second, on variable running time, by Mr. Moser, and the third, on methods of improving handling of traffic in congested centers, by Mr. Sullivan. It was agreed that the final draft of the report should be prepared by Mr. Dana and presented to the executive committee by July 1. It was also agreed that the full report should be presented in abstract form, only, at the convention, in order to permit greater opportunity for discussion. The names of the leaders of the discussion will be determined at an early date.

The following were in attendance: J. V. Sullivan, sponsor, Chicago Surface Lines; Edward Dana, Boston Elevated Railway, chairman; H. C. Moser, Fifth Avenue Coach Company, New York City; J. A. Stoll, United Railways & Electric Company, Baltimore; Samuel Riddle, Louisville Railway; Donald Goodrich, Twin City Rapid Transit Company, Minneapolis; A. G. Neal, Washington Railway & Electric Company; J. M. Campbell, Atlantic City & Shore Railroad, and H. A. Otis, Chicago & Interurban Traction Company.

State Utility Information Bureau Work Discussed

WITH a view to establishing closer co-operation between the State Committee on Public Utility Information and the Advertising Section of the Division of Information and Service of the American Electric Railway Association, the directors of nine state committees and Labert St. Clair of the Advertising Section conferred in Chicago on Wednesday, June 1.

It was agreed that in the future copies of all information furnished on request by the advertising section to any of the various state directors would also be sent to all of the others. The state directors also agreed to submit immediately a series of questions on their local railway problems to the association's advertising section for answer. Such answers will be distributed to all.

Mr. St. Clair reiterated previous assurances that all information regarding the electric railway industry which the association has, or which it can obtain, is at the disposal of the state committees without charge. He also explained the plan of news distribution by the Advertising Section, making it clear that the section does not concern itself with supplying material to strictly local sources, but rather with seeing that news of national importance reaches the hands of the large press associations and the larger dailies. The directors of the state committees, he emphasized, are on a preferred mailing list of the Advertising Section and every attempt is made to avoid duplication of efforts.

H. M. Davis, director of the Nebraska committee, told interestingly of his efforts to bring about closer relations between the public utility managers and the newspaper publishers in his state. He said that in the last year he had visited virtually every town in Nebraska and urged public utility managers to use display advertising space for such of their material as was not of news value. As a result of his efforts, he declared, the utilities of Nebraska spent $118,000 in display space last year.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Detroit Conferences Renewed

Fare and Purchase Questions Considered at Meeting at Which New Spirit Prevails

Following the demand of Mayor Couzens that a new fare schedule of ten tickets for 50 cents or a 6-cent cash fare be put into effect on the city lines of the Detroit United Railway, it was announced that Allen F. Edwards, vice-president of the company, and Alex Dow, newly elected director, would confer on the matter with the Eastern bankers who are interested in the company. It has been indicated by Mr. Dow that the 5-cent fare will be adopted if it is possible for the company to operate on that basis. It is understood, however, that the arrangement would be temporary pending the revision of the accounting system of the company so as to obviate the wide variance between the company and the city on figures.

At the same time the matter will be taken up with the New York men interested relative to arriving at a satisfactory price for the lines which the city plans to take over under the day-to-day agreement. These lines approximate 25 miles in length.

The Mayor's demand upon the company followed a conference of city officials with Mr. Edwards and Mr. Dow at which the engineers for the company and the city were present. The letter from Mr. Edwards in which he agreed to confer with the Mayor stated that he "hoped for a full and satisfactory discussion of the fare question." This was termed by the Mayor the most friendly communication yet received from the company.

It is held that since the reduction in wages of employees put into effect by the company on May 1 the necessity for the higher fares has passed. Action on the original injunction is asked and also an order designating the value of the rebate slips which have been issued by the company with each strip of tickets sold since the high rate was allowed. The fixing of a time limit for the public in redeeming the rebate slips is also asked.

The appraisal of the lines to be purchased by the city by city's representatives has been completed and the city auditors have also gone over the cost to the company for the lines. Only tentative figures have been arrived at and there is a wide divergence between the city and the Detroit United Railway figures on the matter of depreciation to be charged off. The city appraisers figure depreciation at 24.25 per cent. The company figures it at 5.40 per cent. Following the first conference it was announced that a further meeting would be held after the company had been allowed an opportunity to study the figures furnished by the city's appraisers. A compromise on the percentage of depreciation to be allowed is expected to result.

Arbitrators Cut Interurban Wages

Arbitrators in the wage dispute between the Cleveland, Painesville & Eastern Traction Company and the company's trainmen have decided that the men will have to accept a reduction in pay to 43 cents an hour for the first three months' service; 45 cents an hour for the next nine months, and 48 cents an hour for men in service for more than a year. The men have been receiving 55 cents, 58 cents and 60 cents an hour. Thus the men are called upon by the arbitrators to accept the offer made to them by the company.

The three arbitrators, Charles Spaulding, Painesville; Charles Currie, Cleveland and Akron, and S. D. Hutchins, Columbus, in their report said an exhaustive investigation led them to conclude that the cost of living had dropped to such an extent as to make the wage reduction justifiable. The decision also fixes the same wage for trainmen employed by the Cleveland, Southwestern & Columbus Railway as the men on this road had voted to abide by the decree of the Cleveland, Painesville & Eastern Traction Company arbitrators. The award for the Cleveland-Southwestern men is retroactive to May 1.

Arbitration in Favor of Men

The arbitration board considering the wage dispute between the Wheeling (W. Va.) Traction company and its employees has decided the scale shall not be changed for another year. The men refused to accept a proposal for a 10 per cent cut in wages made by the company. Numerous conferences were held in an effort to effect a settlement without resort to arbitration, but these being unavailing the company selected R. D. Jennison, a former executive of the Elm Grove lines, as its representative on the board. The employees authorized Thomas Kady of McMechen, a well-known labor leader, to act for them. After two or three informal meetings these two chose the Rev. R. E. L. Strider of St. Matthew's Episcopal Church as the third and neutral arbitrator. The scale which now continues for another year is as follows: For the first three months 53 cents an hour, next nine months 58 cents and after one year 61 cents.

Franchise Revision Advanced

Only Minor Details Remain to Be Arranged at Cincinnati—Fare Reduction Prospects Good

With the exception of certain minor details every demand made by the officials of the city has been conceded by the Cincinnati (Ohio) Traction Company in a redraft of an ordinance modifying the railway franchise. The minor details will probably be adjusted at a conference to be held soon and the ordinance approved so that it can be presented to the City Council for action. A public hearing on the modifications to be made in the franchise is being arranged by the Council committee on street railroads.

Under the terms of the modified ordinance the city will agree to a deferment of the payment of the franchise tax until after Jan. 1. This is merely a technicality, since the company cannot be compelled, under the terms of the existing franchise to pay the tax until it has been earned. The tax has not been earned for the year 1920 nor for the first six months of the current year and is carried on the books of the company as a deficit.

The ordinance as modified provides, however, that all surplus earnings of the company must be paid into the city treasury each quarter, beginning April 1, 1921, and must be applied to the liquidation of the back tax due to the city. There is a stipulation that the company will be permitted to defer payments into the reserve fund until the rate of fare has fallen below 7½ cents.

The franchise requires the company to create a reserve fund of $650,000. Of this amount $250,000 has been paid into the fund of the company. If the provisions of the existing franchise are insisted upon, it was said, there could be no reduction in fares until the franchise tax has been earned by the company and further until the reserve fund of $650,000 had been completed. A clause in the modified ordinance provides that if the rates of fares are not reduced on Aug. 1 and Nov. 1 the ordinance becomes null and void and the conditions of the existing franchise again become operative.

The modified ordinance further provides that children under ten years as now will be conveyed for one-half the regular rate. All children of the public and parochial schools, however, between the ages of ten and eighteen years, are to be conveyed to and from school for 5 cents.

It was announced that in order that the car riders may avail themselves of the reduced fares by Aug. 1 it will be necessary to pass the ordinance within the next ten days. Because of the referendum law the measure will not become effective until thirty days after it is signed by the Mayor and this will be just in time to permit the company to announce a reduction fifteen days before it will be operative, as is provided for by the terms of the franchise.

Amicable Agreement in Cooperstown

A new agreement was recently entered into between officials of the Southern New York Power & Railway Corporation, Cooperstown, N. Y., and a committee representing the Amalgamated Association without taking the wage matter to arbitration. The principal difference between this year's and last year's contract is that the highest rate was reduced from 45 cents to 40 cents an hour and time and one-half for overtime on the freight runs was eliminated.

The wages to be paid motormen and conductors for the next year will be as follows:

First six months—35 cents an hour.
Second six months—37 cents an hour.
Second year's service—39 cents an hour.
After second year's service—40 cents an hour.
Freight trains—2 cents additional.
Helpers—5 cents an hour under the hourly rate.
Snowplow motormen and conductors—47 cents an hour.
Operators of one-man cars—5 cents an hour over the passenger rates.

In the new contract the established policy of the company to maintain an open shop will be strictly adhered to, which means in the terms of the contract, that "each individual employee is left free to exercise his own discretion as to whether he will join a union or not." A section in the agreement allows for arbitration in the event of dispute between the company and its employees. The agreement will remain in force until June 1, 1922.

Wage Cost Must Be Reduced

W. H. Boyce, general manager of the Beaver Valley Traction Company, New Brighton, Pa., recently sent out a notice to his trainmen asking them to help out in the present extremity—to assume a part of the $93,000 loss which faces the company for the coming year. He tells the men in his circular of the various wage reductions throughout the country, and also reminds them of the company's generosity during the past three years when the men needed help in view of the increase in living costs. He adds further that it would seem that since the first of the year foodstuffs in the vicinity have decreased nearly 40 per cent and the company is asking hardly a third of that in wage reductions.

The Beaver Valley traction officials have met at various times with committees representing the men for a wage adjustment. The matter has now come to a head and the men will either have to accept the reduction, which amounts to about 7 cents an hour, or place the matter in the hands of distinterested arbitrators.

St. Louis' New Wage Contract

Old Men Continued at Former Pay—New Men Get Less—Other Conditions Modified Substantially

A new wage contract has been agreed upon by the receiver of the United Railways, St. Louis, and the carmen's union (Amalgamated) though the details especially in regard to working conditions have not been drafted finally. The entire matter must be passed upon by the United States District Court. After this has been done a digest of the terms of the agreement will be made public.

The old three-year contract expired on June 1, and the new agreement is retroactive from that date. The new contract is to run only until Jan. 1, 1922, and the pay of trainmen who were in the employ of the company on June 1 is not affected, these rates being 55 cents the first year, 60 cents an hour the second year and 65 cents the third year and thereafter. Under the new agreement new employees are to draw 50 cents an hour the first year, 55 cents the second year, 60 cents the third year, and 65 cents an hour the fourth year and thereafter.

Other employees in the carmen's union, except trainmen, were cut approximately 5 cents an hour—car placers from 48½ to 43½ cents, car cleaners from 44¼ to 39¼, while trackmen who were getting 49¼ are to get 42; others who were getting 48 are to get 41, and some who were drawing 44 cents now are to get 35 cents an hour.

Radical modifications have been made in the working conditions in the interest of the management. Extra men called on to work are to receive pay for five hours minimum instead of eight as heretofore, and if a man is assigned to complete a regular run when a regular man gets off before completing the run the motorman or conductor who completes the run is to get only straight hourly time instead of eight hours pay as formerly, and the regular man will be allowed pay only for the actual time he puts in.

The maximum time for regular runs is set at nine hours and the minimum eight hours, with 15 minutes allowed for pulling out and pulling in. Instead of time and a half for overtime as heretofore time and a quarter will be allowed.

An important clause in the new agreement is that there shall be no arbitration in cases where conductors are discharged for stealing. These arbitration cases caused considerable annoyance and expense to the management, though there has been arbitration in only about a dozen instances among the more than 200 cases where men have been discharged for stealing since the receiver took charge of the property two years ago.

Colonel A. T. Perkins, manager for the receiver, assisted by counsel, conducted negotiations for the new contract with Frank O'Shea, one of the international vice-presidents of the union, his lawyer and a committee of trainmen. There are approximately 5,000 members of the local union. At a meeting on June 11, 4,137 of the members voted on the new contract and accepted it, 3,809 to 328. When the drafting of the document is completed this week it will go to the Federal Court.

In limiting the new contract to a period of seven months Colonel Perkins has made it plain to the employees that there will have to be a considerable reduction in pay on Jan. 1 unless the fare is raised from 7 to 8 cents or travel increases greatly. The daily receipts now are running an average of about $2,500 a day less than they were at this time last year under the same rate of fare.

The question of a fare increase is waiting on the revaluation of the property by the Missouri Public Service Commission. The inventory was completed several months ago after more than three years of labor on the part of the commission's engineers and accountants. A hearing on the findings is set for September. In the meantime the commission is allowing 6 per cent on a tentative valuation of $50,000,000. The company expects to be able to show that this is away under the true value of the property.

In passing on the wage question Colonel Perkins told the men that there are some who are overpaid, others who are drawing about what they are worth, and still others to whom he would like to pay more money. Inasmuch as injuries and damages are costing the company about $3,000 a day, it is his theory that a good trainman is worth good pay. Under the new working agreement it will be easier to get rid of the bad ones than it has been in the past.

Voluntary Acceptance of Wage Reduction

Motormen and conductors of the Citizens' Traction Company, Oil City, Pa., voted unanimously on May 18 to accept a wage reduction of 10 cents an hour. The wage scale in cents per hour from Jan. 1, 1917, to June 1, 1921, is shown in the accompanying table.

WAGE SCALE OF EMPLOYEES OF OIL CITY TRACTION COMPANY

	1917		1918		1919	1920	1921
Period	Jan. 1	Aug. 31	March 9	July 31	Sept. 10	April 26	June 1
First six months	..	..	..	30	41	51	41
Second six months	..	..	..	34	43	53	43
Third six months	..	..	..	..	45	55	45
First year	24	26	30	..	..	..	..
Second year	25	27	32	36	..	One-man operator 5c. additional	One-man operator 5c. additional
Third year	26	28	34	38	..		
Fourth year	27	29	36	40	..	..	..
Fifth year	28	32	..	..	..	..	..
Sixth year	30	..	..	..	..	..	..

Relief Program Enacted

Connecticut Legislators Come to Aid of Electric Railways by Carrying Out Governor's Recommendations

The 1921 session of the Connecticut General Assembly, which has just adjourned, was one of signal importance toward improvement of the electric railway situation in the State. Conditions have been distinctly unsatisfactory. With the Hartford & Springfield, the Danbury & Bethel and the Shore Line in the hands of the receivers and the Connecticut Company barely weathering the storm of adverse conditions aggravated by ruinous jitney bus competition, the legislators sat down with the plain evidence before them of a transportation crisis.

GOVERNOR LAKE in his inaugural message gave much attention to the problem and submitted detailed and constructive recommendations which showed his own critical investigation of the subject. He recommended, in brief, relief from the burdensome requirements of bridge construction and pavement costs levied on the trolley companies, rigid regulation of jitney buses and the granting of permission to electric railways to operate motor bus lines as connecting links or feeders to regularly maintained lines. This program was carried out by the Legislature in its entirety besides the enactment of several lesser measures all contributing to the general relief of trolley companies.

Paving requirements were covered in the passage of a bill by which companies were required to pave 8 in. on each side of the rails, making 32 in. for a single track and twice that amount for a double track. The demands heretofore have been 8 ft. 8 in. over all for single track and 19 ft. for double track.

TAX RELIEF MEASURES PASSED

By another act the highway commissioner is empowered to determine what amount electric railways shall pay toward bridge construction. Formerly one-third the cost of construction had been levied on bridges located in towns, and an indefinite contribution toward the cost of those in cities, the sum to be determined by conference and agreement. The matter now rests wholly in the hands of the highway commissioner and the arrangement is regarded as quite satisfactory to all concerned.

On the subject of taxation two important measures were passed. The first reduces the state tax levied on electric railways from 4½ per cent of gross earnings to 3 per cent of gross. A measure to make the levy on net earnings failed of passage because of the improbability of its yielding any revenue to the State. The second taxation bill enacted is designed to enable the electric railways to clean up their back taxes within six years after July 1, 1922. Interest will be charged during these years at the rate of 4½ per cent and after that date at the rate of 8 per cent. A similar arrangement of interest charges was provided in a bill covering the Connecticut Company's indebtedness of $500.000 to the State for the cost of the Washington bridge between Milford and Stratford. These measures are expected to go a long way toward re-establishment of Connecticut street railways on a dividend basis.

Perhaps the greatest single element which has militated against the best interests of efficient and paying trolley service has been the unfair and irresponsible competition of jitney buses, which have made alarming inroads upon the revenue of both rural and urban lines. The Governor dealt with the subject at length in his messsage and took an uncompromising stand for strict regulation of the jitney. Early in its session the Legislature quickly disposed of the matter by vesting in the Public Utilities Commission the power to regulate the public motor bus as regards routes of travel and to exact responsibilities incumbent upon all common carriers. The jitney problem had been previously dealt with by localities with moderate success, but in this new law authority has been centralized and the matter is in hand. Immediately upon its passage the commission began hearings on the flood of applications for licenses to operate jitney buses here and there in the State but so far it has reserved its decisions in all cases.

Another bill authorizes electric railways to operate motor buses to supplement regular electric service. This is in accordance with the Governor's recommendation. So far the Danbury & Bethel Street Railway has announced its intention of expanding its service by this means; and it is also said that the Connecticut Company has under consideration a plan for supplementary motor service on its Hartford division.

Attention of the law makers was directed to the Shore Line Electric Railway and its difficulties, with the result that legislation was effected which means the restoration of service on at least a part of the system. Measures acted upon were for the incorporation of companies to acquire the property and franchise of the old company for the purpose of operation. What service has been rendered over the system recently, it is understood, has been under lease by the Connecticut Company. Part of the road, the section from New Haven to Saybrook, was sold for junk last fall, but the purchaser was reported by Receiver Robert W. Perkins to have defaulted in his contract and the deal was terminated after some of the track had already been removed.

Labor elements made an effort to get through the Legislature a bill to do away with the one-man car. It was unsuccessful, the one-man car having pretty well established itself in the various localities where it has been introduced.

Thus that part of the Legislature's business dealing with electric railways is a fulfillment of every recommendation made by the Governor; and further, as in the case of the tax relief bills, it carries out the recommendations made to the General Assembly by the Public Utilities Commission in the report of its inquiry into electric railway conditions as authorzed under an act of the 1919 sesson. The commission's program and that of the Governor coincided largely. The former recommended that electric railways be authorized to abandon non-paying lines, but to this end no legislative action was taken. It had also suggested that no interest be charged on deferred taxes.

Not one of these bills encountered noteworthy opposition. Committees expedited their work, debates were perfunctory and the Legislature's action throughout was characterized by a unanimity of action which pointed to a realization of the urgency of these corrective measures, which now have the Governor's signature.

Franchise Surrendered in Indianapolis

The Indiana Public Service Commission has formally entered on its records that the franchise of the Indianapolis Street Railway has been surrendered. The announcement that the company would surrender its franchise was made on June 3 by Dr. Henry Jameson, president of the board of directors. City officials have understood for some time that such action was contemplated.

Two of the biggest questions resulting from the action of the company are whether the company shall continue to pay its franchise tax of $30,000 a year, and whether the company shall continue to pave between its tracks as required by the franchise which now no longer exists.

The company has refused to pay its installment of franchise tax due April 1. Under the franchise it had until June 1 in which to make the payment but it continued to refuse. Mr. Ashby has announced his intention to sue for the payment, unless an agreement can be reached. It is the contention of the city that the company should continue to pay the tax, although not legally obligated to do so.

In the matter of paving, the company has been paving between the tracks and maintaining all such pavements. It now proposes that the city shall lay the pavements and the company maintain them. The city contends that the franchise arrangement should continue.

At a conference on June 8 the city and Dr. Jameson stated their respective positions in a general way, the only definite agreement reached being that pending final settlement of the question the company will take orders from the board of public works.

Wages Cut in Salt Lake

Reduction There Averages 12½ per Cent—Saving to Company Estimated at $125,000

A decision reducing wages of employees of the Utah Light & Traction Company, Salt Lake City, Utah, an average of 12½ per cent was handed down on June 8 by the board of arbitration in the wage controversy between the company and its employees. The awards of the arbitration board and the wages the men were receiving prior to the expiration of their agreement on April 30, 1921, are as follows:

	Wage per Hour	
	Old, Cents	New, Cents
Carmen—		
First year	57	50
Thereafter	64	57
Painters—		
First grade	68	59
Second grade	59	50
Helpers	50	41
Carpenters—		
First grade	68	59
Second grade	61	52
Helpers	53	44
Welders—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Blacksmiths—		
First grade	68	59
Hammer men	55	46
Helpers	50	41
Machinists—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Armature winders—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Electrical Department—		
First grade	68	59
Second grade	55	46
Helpers	50	41
Barnmen and pitmen—		
First grade	61	52
Second grade	55	46
Helpers	50	41
Car cleaners	50	41
Welders (nine-hour day)	$5.65 to	$5.50
Switch repairers (nine-hour day)	5.25 to	4.50
Track cleaners greasers and teamsters (nine-hour day)	4.50 to	3.65
Bonders, railcutters and yardmen (nine-hour day)	4.50 to	3 65
Trackmen, first six months (nine-hour day)	4.50 to	3.25
Trackmen thereafter (nine-hour day)		3.65

The decrease is approximately one-half of what was asked by the officials of the company, and ranges from a decrease of 11 per cent to 18.9 per cent. The decision will reduce the annual payroll of the company approximately $125,000.

The award is retroactive to May 1, 1921. It will be included as a part of the working agreement between the company and its employees for the year ending April 30, 1922. The award is in the nature of a compromise by which both the company and the employees have agreed to abide.

The wage dispute arose early in April, when the company gave notice that it desired to reduce wages when the next annual working agreement with employees went into effect on May 1. The employees opposed the reduction, and both sides agreed to place the matter before an arbitration board for settlement.

The board has been in executive session since June 3. For a week prior to that time a public hearing was held and testimony from both sides was received by the board.

In the opinion of the members of the board of arbitrators the differential between regular and temporary track employees will enable the company to do more of the much-needed work on city pavements with the money set aside by it for maintenance and repairs.

Chicago Bills Still Pending

With only five days more left of the current session the Illinois State Legislature took a recess on June 11 having before it several important measures affecting the Chicago traction companies and other utilities.

Mayor Thompson's bill for the formation of a "transportation district" and a 5-cent fare was passed by the lower House and sent to the Senate.

The new utilities act had been in the Senate for several days and had been burdened with amendments until it did not much resemble its original form. It looks as though both measures were booked for some rough sledding, with the final outcome uncertain.

Owing to the fight made on the utilities bill by down-state interests it was amended so as to apply in the "home rule" section to Chicago alone and would require signatures of 25 per cent of the voters before being submitted to a referendum. This was said to be fatal to the measure. The Senators also voted to eliminate the section which would prevent the new commission from abrogating rate contracts between companies and municipalities.

Another bill filed late in the session would permit the consolidation of elevated and surface lines. Another would allow the proposed "transportation district" an indeterminate franchise for operation of utilities. Both these measures are said to be necessary to make Mayor Thompson's scheme a success.

Two Years of Bickering Ended

Wages Cut, Fares Reduced and One-Man Cars Sanctioned at Davenport—Future Prospects Bright

With one-man cars operating in Davenport, Iowa, fares reduced, and separate wage and working agreements signed with trainmen of Iowa and Illinois, the Tri-City Railway's two years of disputing with trainmen and City Councils has come to an end. Politics, class hatred and ignorance all acted as a deterrent to the utilities there in their attempt to obtain a reasonable rate for their services.

UNDER the agreement signed by the men a wage scale of 50 cents an hour for one-man car operators and 55 cents for trainmen on two-man cars goes into effect. The previous scale was 70 cents an hour on two-man cars, and prior to June 1 there were no one-man cars in operation. The company also refused the international trainmen's union recognition, but recognized the Davenport and Rock Island-Moline locals. Agreements were signed on June 13.

A court order authorizing the operation of one-man cars in Davenport was granted in the District Court by Judge A. J. House on May 19. The railway applied for a temporary injunction a few days before, showing in statements that it was impossible to make a reasonable return on the stock of the corporation with two-man operation. It was also shown that the average return for a four-year period had been only 2 per cent.

Meanwhile the men prepared to strike on the expiration of the wage scale on June 1. B. J. Denman, president of the Tri-City Railway, had announced some months before that the wage scale would be cut from 70 cents to 40 cents an hour on that date. A strike order was issued by the locals for June 1, but withheld when negotiations were taken up with the understanding that the men should work for 40 cents an hour, but that the wage finally agreed upon should be retroactive from June 1.

For a while the company refused steadfastly to recognize the union either as an international or local. A definite date for a strike was fixed, but this was set aside at the request of Harry M. Schriver, Mayor of Rock Island. He called the traction officials and union representatives together and proposed that Frank T. Hulswit, president of the United Light & Railways Company, Grand Rapids, Mich., of which the Tri-City Railway & Light Company is a subsidiary, should be called to the Tri-Cities.

Mr. Hulswit, then in New York, found that it would be impossible to reach Davenport before the date set by the union for a strike, so he instructed President Denman to proceed with negotiations. Meanwhile Vice-President R. Schaddelee of the United Light & Railways hurried to Davenport.

In two meetings which lasted many hours the traction troubles of two years were ironed out. The scale suggested by Rock Island's Mayor was adopted, the local unions recognized, and a working agreement satisfactory to both the company and the men arrived at.

In Davenport the 9-cent fare, with three for a quarter, was reduced to an 8-cent straight rate through the approval of the use of one-man cars and it is possible that a reduction from 9 cents to 8 would follow the granting of similar privileges to the company in Rock Island and Moline. Bridge line cars which cross the government bridge from Rock Island to Davenport are continuing with two-man operation.

Because of a Socialist administration in Davenport, which made a sport of baiting the utilities, the railway was forced into the courts to obtain one-man service for that city. Several times attempts to come to an agreement with the City Council were halted at the last moment.

Hoping to "get something on" the railway and light corporation the city ordered a public audit of the company books. The accounts were promptly thrown open by the company to the auditors, who reported to the Council after several months of research. The figures completely backed up the claims of the company that it was virtually bankrupt.

In open Council meeting Henry Vollmer, ex-congressman and special counsel for the city, told the Socialist members that the companies were bankrupt and must be granted one-man service and a higher gas rate. City Attorney U. A. Schreechfield, Socialist, reiterated this statement and it seemed as though an agreement was about to be reached.

Despite this interpretation of the audit and appraisal, the Council refused to meet the company half way. A proposal for the adoption of one-man service and a reduction of fares was spurned. Unable to obtain redress from the city, the railway then took its case to the courts.

Brooklyn Wages to Be Reduced

A reduction in the wages of the employees of the Brooklyn (N. Y.) Rapid Transit Company to take effect on Aug. 6 has been determined upon by Lindley M. Garrison, receiver of the company. Mr. Garrison has sent letters to the various committees representing the employees whose wages were increased last August, asking them to get together and take up the matter and agree, if possible, on the amount of the reduction.

The receiver has sent the following letter to William S. Menden, general manager for the company:

> You will recall that in my notice to employees dated July 16, 1920, I made the most recent increase in rates of pay, practical upon an annual basis. This became effective on Aug. 6, 1920. That increase, added to previous increases, amounted to 35 per cent above the rates in effect on Aug. 1, 1919.
>
> Owing to conditions, which need not be recited, it is obvious that we can no longer continue at the present high scale. I have abstained, in view of the circumstances, from making any reductions until the lapse of a year from the time of the last increase. That year will be up on Aug. 6, 1921. The time has now come when this matter must be taken up, and I wish that you would in due course confer with the various representative bodies in order that a proper basis may be arranged for the wage scale after Aug. 6, 1921.

The so-called "representation plan" in Brooklyn was formulated by Judge Julius M. Mayer of the United States District Court in co-operation with Mr. Garrison. In November of last year the first elections were held and men who had been with the company for sixty days were allowed to vote. But it was specified that they take an oath that were not members of the Amalgamated.

The present rate of pay for motormen and conductors on the surface lines is 57, 59, 62 and 67 cents. On the elevated lines the conductors are receiving 59, 60 and 62 cents while the guards are receiving 53, 54 and 57.

Readjustment of wages has also been suggested by the officers to the men of the Interborough and the New York Railways.

Railway Man Killed in Accident—Others Injured

Spencer Vandenberg, manager of the Louisville Safety Council, died on June 14 at Norton Infirmary, Louisville, Ky., from injuries suffered Saturday when the automobile in which he was returning from a round-table barbecue ran into a tree. By the irony of fate Mr. Vandenberg was killed in an accident of the kind he was trying to educate the public to avoid.

Mr. Vandenberg was on the way home in the car of George Dehler, who asked several friends to ride with him. Mr. Vandenberg, Neil W. Funk, Frank E. Belleville, general auditor of the Louisville Railway, and John Carroll were also in the car when it ran into a tree at a sharp turn in the road near St. Matthews. Mr. Vandenberg was thrown against the tree. He suffered four broken ribs, a fractured left hip, injuries to the right leg, and cuts and bruises. It is believed that a broken rib punctured the lung and brought on pneumonia which terminated fatally.

Mr. Vandenberg went to Louisville in January from Schenectady to become manager of the Safety Council, engaged in the work of teaching the public to avoid accidents. His home was in Eastover. Mr. Vandenberg was formerly with the Schnectady Railway.

Mr. Funk is expected to recover. He is superintendent of the claim division of the Louisville Railway. He had expected to go on the C. E. R. A. boat trip. Among his injuries is a fractured hip.

Programs of Meetings

Final Arrangements for C. E. R. A. Summer Meeting

The program for the summer meeting of the Central Electric Railway Association, which will be held on board the S.S. *South American*, has been announced by Sam W. Greenland, chairman of the program committee. The summer cruise of the association will begin at Chicago, where the boat will leave from the Municipal Pier on Sunday morning, June 26, at 8:30 a.m. central standard time, or 9:30 Chicago time. It will leave Toledo Tuesday morning, June 28, at 11 o'clock central standard time or 12 o'clock eastern standard time, from the Toledo Railway & Light Company dock, which is adjacent to the White Star Line docks. The time of leaving Toledo was set back one hour by the committee on arrangements in order to permit various members to leave their homes Tuesday morning and arrive in Toledo in time to catch the boat. The details of the program follow:

Sunday, June 26, 11 a.m.

Song Service.
Address, by H. C. DeCamp.

Wednesday, June 29, 9 a.m.

Meeting of the Executive Committee.

"Automatic Substations," by C. A. Butcher, Westinghouse Electric & Manufacturing Company.

Discussion by Lawrence D. Bale, engineer of substations, the Cleveland Railway; Charles H. Jones, Chicago, North Shore & Milwaukee Railroad.

Thursday, June 30, 3 p.m.

"Merchandising Transportation," led off by the report of the committee on education and training of employees, by James P. Barnes, chairman, president Louisville Railway.

Discussion by Harry L. Brown, Western Editor ELECTRIC RAILWAY JOURNAL, Chicago; Bert Weedon, general freight and passenger agent, Interstate Public Service Company, Indianapolis; George H. Kelsay, superintendent of power and shops, Cleveland, Southwestern & Columbus Railway, Elyria, Ohio; W. S. Rodger, general traffic manager, Detroit United Railway; E. B. Gunn, master mechanic, Western Ohio Railway, Wapakoneta, Ohio.

SPECIAL CARS TO BE RUN

The proposal to run a special car from Indianapolis to Chicago on Saturday, June 25 is being considered.

Those arriving in Chicago on Saturday night may go direct to the boat and secure their staterooms and breakfast Sunday morning on the boat for $2.50. The boat will be at the pier after 6 p.m., Saturday.

For those who desire to make only the trip from Toledo to Chicago, a special car has been arranged, leaving Indianapolis on Monday, June 27, at 7:00 a.m., Peru, Ind., at 9:30 a.m., and arriving at Fort Wayne, Ind., at 11:10 a.m. A thirty-minute stop here will be made for lunch and the car will leave Fort Wayne at 11:40, Lima, Ohio, at 1:40 p.m., Findlay, Ohio, at 2:50 p.m., and arrive at Toledo at 5:05 p.m., central standard time in each case.

On the return trip a special car will be run from St. Joseph, Mich., to Indianapolis, leaving St. Joseph July 12.

Those planning to attend this meeting and cruise, are urged to send in their reservations to John Benham, 15 South Throop Street, Chicago, at once, in order that their names may appear in the printed souvenir distributed on the boat.

Railroad Mechanical Section Postpones Meeting

The annual meeting of the American Railway Association, mechanical division, which was to have taken place at the Drake Hotel, Chicago, on June 15 and 16, has been postponed to June 29 and 30, 1921. The meeting place has also been changed from the Drake Hotel to the Blackstone. The official circular of June 10 announcing the postponement says:

> Owing to present unusual conditions and inability of members to attend the meeting of the mechanical division, American Railway Association, called to be held in this city (Chicago), Wednesday and Thursday, June 15 and 16, 1921, the meeting has been postponed to Wednesday and Thursday, June 29 and 30, 1921.
>
> The sessions will be held at the Blackstone Hotel, Chicago, instead of the Drake Hotel as originally planned. It is suggested that members arrange for their hotel reservations without delay.

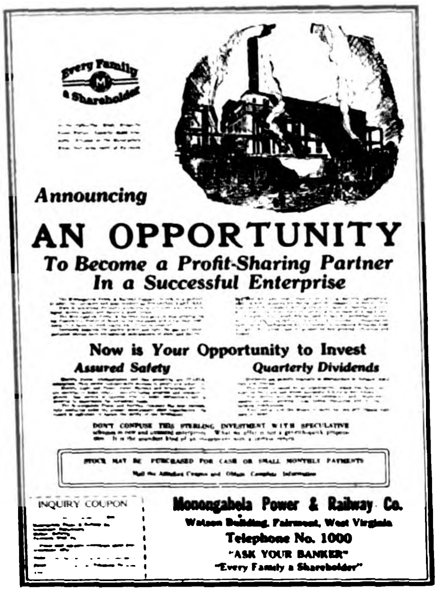
Financial and Corporate

Preferred Stock Offering to Be Continued

In the belief that it will be of advantage both to itself and to the communities served to have as many local stockholders as possible, the Monongahela Power & Railway, Fairmont, W. Va., will continue to offer its preferred stock even after the recent $2,000,000 offering of preferred stock has been taken. This offering was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 28.

A new department known as the "Investment Department" has been created to handle the sale of stock, bonds and other forms of securities offered. E. B. Smith is the manager of this department. He has eight salesmen in his organization at present. In addition to these regular salesmen, Mr. Smith is organizing the company's employees and has selected about fifty as an additional employees organization. Arrangements have been made with the banks in the territory served by the company whereby they will also assist in selling the stock. Thus the organization worked out for the handling of the stock includes eight regularly employed salesmen, about fifty employees and the banks, fifty-four in number.

Besides the offering being made direct to patrons through salesmen, advertising is being carried in ten newspapers, where every family is urged to become a "profit-sharing partner." In order to educate the public regarding the character of the company, extent of its property, kind of services rendered and its relation to the growth of the communities served by it descriptive matter and circulars have been mailed to patrons and customers and display cards announcing the sale have been posted in the company's ticket offices and waiting rooms. In connection with this offering the company has issued an interesting illustrated booklet, containing a map of the company's electric railway properties, proposed lines, power stations, gas lines, coal mines, etc.



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Announcing

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To Become a Profit-Sharing Partner
In a Successful Enterprise

Now is Your Opportunity to Invest

Assured Safety

Quarterly Dividends

DON'T CONFUSE THIS STERLING INVESTMENT WITH SPECULATIVE

STOCK MAY BE PURCHASED FOR CASH OR SMALL MONTHLY PAYMENTS

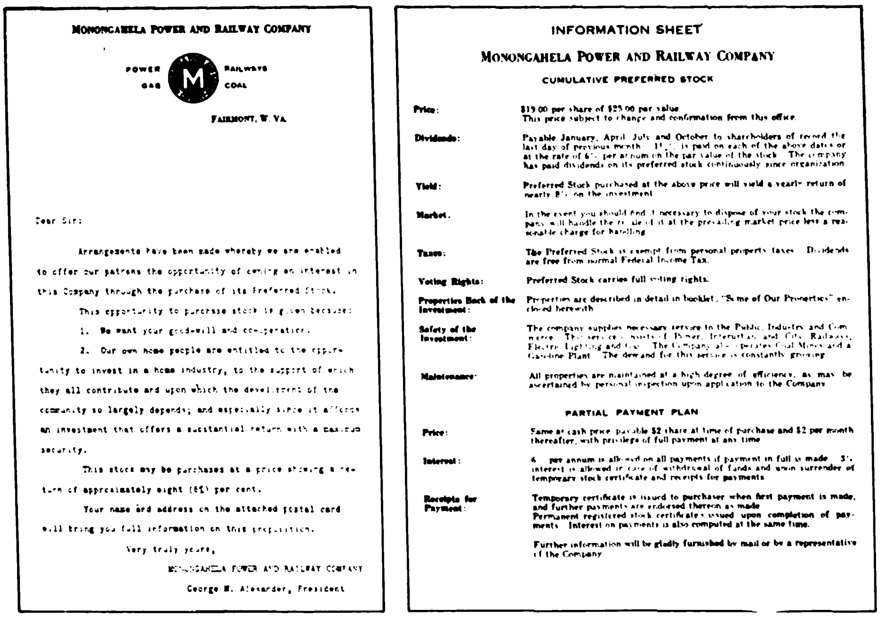
Mail the Attached Coupon and Obtain Complete Information

INQUIRY COUPON

Monongahela Power & Railway Co.
Watson Building, Fairmont, West Virginia
Telephone No. 1000
"ASK YOUR BANKER"
"Every Family a Shareholder"

TYPICAL NEWSPAPER ADVERTISEMENT

Although the outcome of this offering cannot at this time be clearly indicated, the sales made to date have been much in excess of expectations and indicate the success of the offering.



MONONGAHELA POWER AND RAILWAY COMPANY

POWER
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FAIRMONT, W. VA.

Dear Sir:

Arrangements have been made whereby we are enabled to offer our patrons the opportunity of owning an interest in this Company through the purchase of its Preferred Stock.

This opportunity to purchase stock is given because:

1. We want your good-will and co-operation.

2. Our own home people are entitled to the opportunity to invest in a home industry, to the support of which they all contribute and upon which the development of the community so largely depends; and especially since it affords an investment that offers a substantial return with a maximum security.

This stock may be purchased at a price showing a return of approximately eight (8%) per cent.

Your name and address on the attached postal card will bring you full information on this proposition.

Very truly yours,
MONONGAHELA POWER AND RAILWAY COMPANY
George M. Alexander, President

INFORMATION SHEET

MONONGAHELA POWER AND RAILWAY COMPANY

CUMULATIVE PREFERRED STOCK

Price:	$19.00 per share of $25.00 par value This price subject to change and confirmation from this office.
Dividends:	Payable January, April, July and October to shareholders of record the last day of previous month. 1½% is paid on each of the above dates or at the rate of 6% per annum on the par value of the stock. The company has paid dividends on its preferred stock continuously since organization.
Yield:	Preferred Stock purchased at the above price will yield a yearly return of nearly 8% on the investment.
Market.	In the event you should find it necessary to dispose of your stock the company will handle the resale of it at the prevailing market price less a reasonable charge for handling.
Taxes:	The Preferred Stock is exempt from personal property taxes. Dividends are free from normal Federal Income Tax.
Voting Rights:	Preferred Stock carries full voting rights.
Properties Back of the Investment:	Properties are described in detail in booklet, "Some of Our Properties" enclosed herewith.
Safety of the Investment:	The company supplies necessary service to the Public, Industry and Commerce. This service consists of Power, Interurban and City Railways, Electric Lighting and Gas. The Company also operates Coal Mines and a Gasoline Plant. The demand for this service is constantly growing.
Maintenance:	All properties are maintained at a high degree of efficiency, as may be ascertained by personal inspection upon application to the Company.

PARTIAL PAYMENT PLAN

Price:	Same as cash price, payable $2 share at time of purchase and $2 per month thereafter, with privilege of full payment at any time.
Interest:	6% per annum is allowed on all payments if payment in full is made. 3% interest is allowed in case of withdrawal of funds and upon surrender of temporary stock certificate and receipts for payments.
Receipts for Payment:	Temporary certificate is issued to purchaser when first payment is made, and further payments are endorsed thereon as made. Permanent registered stock certificates issued upon completion of payments. Interest on payments is also computed at the same time.

Further information will be gladly furnished by mail or by a representative of the Company.

APPEAL MADE DIRECT TO PROSPECTIVE PURCHASER

Toledo $260,672 Behind

Cumulative Deficit Increased by $56,371 in May—Prospects Greatly Improved

The increasing economy of operation of the Toledo railway lines, under Commissioner Wilfred E. Cann, is shown in the report for May, when the smallest monthly deficit yet sustained was reported. The net loss in operation for the month was $56,371. The total deficit accrued in four months is $260,672.

Chairman Henry Truesdall of the board predicted a fare increase to 7 cents in August. The service-at-cost ordinance provides for no fare change in the first six months of operation. Commissioner Cann believes, however, that fares will be back to 5 cents within a year.

During the month of June further anticipated savings should amount to $25,000, due to decrease in wages of carmen. The men last week ratified the agreement by which their scales were set at 45, 47 and 50 cents an hour. This is a cut of 10 cents an hour from the last year scale. This new scale was incorrectly reported in the ELECTRIC RAILWAY JOURNAL for June 11 to be 45, 57 and 60 cents.

The power rate has not yet been adjusted. Some believe it can be reduced nearly 50 per cent. Even a 10 per cent reduction would mean a saving of $24,000 on four months' operation.

Further rerouting plans have been approved. Service will be cut off the Maumee Avenue end of the Starr-Maumee line. Cherry cars will not run from the Union Station loop. A saving of more than $4,000 a month with little change in service will thus be gained.

No decision has as yet been made by the Common Pleas Court on the bus regulatory measure. The case is held up by a temporary injunction which bus owners secured.

In May, although railway passenger receipts fell off $2,631 as compared with the previous month, due to increased interurban rentals and car rentals, the net income increased $8,677. Operating expenses were cut $15,286 as compared with April. The monthly operating ratio also decreased from 90.60 to 83.46.

Commissioner Cann said the loss of 1.0544 cents per passenger during May should call for a further reduction in service but that the present schedules would be maintained. Average daily passenger receipts for the last four months are as follows: February, $9,500; March, $9,186; April, $8,988; May, $8,613. June shows a further decline over May figures of $325 a day.

Construction Company Denied Payment.—The application of the Interborough Subway Construction Company, an Interborough subsidiary, for a writ of mandamus directing Controller Craig to pay the company $1,750,000 as part of the cost of installing the multiple car door device, was denied recently by Justice Gavegan of the Supreme Court.

Answers to Accounting Questions

Another Series of Questions and Tentative Answers Under the Uniform System of Accounts for Electric Railways

Another series of tentative answers to questions raised in connection with the uniform system of accounts, prescribed by the Interstate Commerce Commission, has just been issued. As these answers have not received the formal approval of the commission, however, it should be understood that the decisions do not represent its final conclusions and that they are subject to such revision as may be thought proper before final promulgation in the accounting bulletins of the commission.

THE case numbers covered below are from A-589 to A-602, with certain omissions. Other installments will follow. The omitted numbers represent cases which either are not of sufficient importance to justify publication or involve questions upon which a definite conclusion has not been reached.

Q (*A*-589). To what account should be charged:

(a) Taxes payable on monies and other items the income from which is includible in account 208, "Income from unfunded securities and accounts?"

(b) Federal income and excess profits taxes?

(c) Internal revenue stamps for use generally in railway operations?

(d) A carrier's investment in war savings stamps and war thrift stamps?

(e) War taxes paid on telephone and telegraph messages?

A. (a) To account 215, "Taxes assignable to railway operations," or to account 218, "Miscellaneous taxes," in accordance with the texts of those accounts.

(b) To account 215, "Taxes assignable to railway operations," unless directly assessed on income from miscellaneous physical property, in which case account 205, "Net income from miscellaneous physical property," shall be charged or unless they are assessed on income from securities owned and are therefore chargeable to account 218, "Miscellaneous taxes."

(c) To account 215, "Taxes assignable to railway operations."

(d) To account 409, "Loans and notes receivable."

(e) To account 215, "Taxes assignable to railway operations," or to road and equipment account 549, "Taxes," as may be appropriate.

(See Cases 584 and 598 (a).)

Q. (*A*-590). An industry furnishes cars for movement of its employees from city points to its suburban plant. The carrier furnishes locomotive, crew and electricity, and hauls the cars over its own rails to the industrial plant, for which it is paid on the basis of locomotive trips. How should the revenue be credited?

A. To account 109, "Miscellaneous transportation revenue."

Q. (*A*-591). A carrier under contract to transport mail, during a temporary stoppage of its own transportation facilities, hires an automobile and driver to perform that service. To what account should the expense be charged?

A. To account 78, "Other transportation expenses."

Q. (*A*-592). What is the proper accounting for investment in and maintenance of turntables located at the entrances of shops?

A. The investment is chargeable to account 523, "Shops and carhouses," and the maintenance to account 24, "Buildings, fixtures, and grounds."

Q. (*A*-593). To what account should be charged:

(a) The cost of special work or curves made in the carrier's own shops?

(b) The cost of cut rails issued from stock to connect such items as switch mates, switches, frogs, etc., in the lead of a special work layout?

A. (a) To account 508, "Special work." Plain curves shall be treated as rails.

(b) If the cut rails are only sections of rail which are necessary to connect up the switch mates, switches, frogs, etc., with the last regular rail laid in the track their cost shall be charged to account 507, "Rails, rail fastenings and joints," but if they are of special character, not simply a section of ordinary rail, they shall be included in account 508, "Special work."

Q. (*A*-595, a). When electric light sockets and switches are installed as permanent parts of buildings, cars or conduits, should renewals be considered supplies as indicated in Case 216 in Accounting Bulletin 14?

A. In such cases they shall be charged for appropriate repair accounts.

(See Case 69, Accounting Bulletin 14.)

Q. (*A*-595, b). To what account should be charged the pay of employees under the supervision of the general treasurer who are stationed at car barns to receive conductors' collections?

A. To account 63, "Superintendence of transportation."

Q. (*A*-596, a). To what account should be charged repairs of oil pumps, oil tanks and permanent tank piping installed in an oil house at shops?

A. If this apparatus is for distributing oil for shop use, the repair expense for the tank and piping shall be charged to account 24, "Buildings, fixtures, and grounds," and that for the pump, if not a part of the tank, to account 36, "Shop equipment." If the apparatus is for oil used in connection with conducting transportation, all repairs shall be charged to account 24.

Q. (*A*-596, b). To what account should be charged repairs to a sand hopper and to the piping connecting the sand drier with the hopper?

A. To account 24, "Buildings, fixtures, and grounds."

Q. (*A*-597). To assist in retaining its employees a carrier built and operates a temporary rooming building. How should the revenue and expenses of this project be distributed?

A. Rents received from employees shall be credited to account 117, "Rent of buildings and other property." Building repairs shall be charged to account 24, "Buildings, fixtures, and grounds," and expenses of operating for employees' use to account 78, "Other transportation expenses."

Q (*A*-598, a). To what account should be charged:

(a) The cost of revenue stamps affixed to proxies sent in by stockholders for use at the annual meeting? (b) The cost of stamps affixed to notes classified as unfunded debt?

A. (a) To account 225, "Miscellaneous debits," (b) To account 221, "Interest on unfunded debt."

(See Cases 584 and 589.)

Q. (*A*-598, b). A carrier assumes the rent for an encampment site in order to induce school cadets to hold an encampment on its line. To what account should the rent be charged?

A. To account 81, "Parks, resorts and attractions."

Q. (*A*-599, a). At the direction of the court, pending a decision as to the legality of a fare increase, a carrier deposits daily with a trust company amounts equivalent to the difference between revenue based upon the former fare and the total of fares collected. What is the proper accounting?

A. The deposits with the trust company shall be debited to account 408, "Special deposits," and concurrently credited to account 446, "Other unadjusted credits." If final decision favors the carrier the amount shall be transferred from account 446, to account 101, "Passenger revenue," unless the decision is delayed beyond the current year and the amount is relatively large, in which event the carrier may apply for permission to use account 304, "Delayed income credits." If the increased fare is decided to be illegal accounts 408 and 446 shall be cleared as the refunds are made.

Q. (*A*-599, b). What is the proper accounting for equipment permanently retired from service but held for disposition?.

A. It shall be written out of the property account and carried in a suspense account at an equitable valuation.

Q. (*A*-601). To what account should be charged the cost of metal fare tokens sold to patrons for use in lieu of tickets and coins?

A. To account 67, "Miscellaneous car service expenses." Tokens held in stores shall be carried in account 411, "Material and supplies," until issued for use.

Q. (*A*-602, a). To what account shall be charged the cost and maintenance of a pier to be used exclusively for handling powerhouse fuel?

A. The investment cost shall be charged to account 539, "Power plant buildings," and the maintenance cost to the appropriate primary accounts under general account III, "Power."

Cash-Fund Ordinance Pending

In consideration of the June appropriation ordinance for the Seattle (Wash.) Municipal Railway it was decided at a recent meeting of the utilities committee of the Council to set aside each month out of the earnings one-twelfth of the yearly charges for bond interest and redemption. The department's auditor suggested waiting until the interest and redemption dates before setting aside the cash needed to save going on a warrant basis earlier.

Superintendent D. W. Henderson, however, said the fund had $132,574 in cash on hand in the city treasury after allowance for outstanding warrants, and recommended setting aside the interest and redemption cash since there was a surplus on hand. The first item considered was setting aside interest and redemption on an issue of $775,000 general bonds, maturing from 1933 to 1938. As the state law does not require setting aside money for redemption of general bonds until seven years before maturity, it was voted not to set aside money for this purpose now. It was decided to set aside funds for interest on the general bonds, also for interest and redemption on the utility bonds.

As the matter stands at present, the railway did not set aside in March, April or May the $70,250 chargeable monthly for the redemption of the $833,000 issue of the $15,000,000 Stone & Webster bonds due next March 1, and on another small issue, and so owes that fund $210,750. The $70,250 for June for this purpose will be set aside. No money has been set aside for depreciation, the money being used to retire outstanding warrants.

Coal, Material and Labor Costs Decrease Earnings

According to the annual report of the Terre Haute, Indianapolis & Eastern Traction Company for the year ended Dec. 31, 1920, the company had, after paying operating expenses, taxes and fixed charges, $725,000 to meet dividend requirements, interest on notes, car trust equipment notes, sinking funds, etc. Gross earnings amounted to $5,316,288, an increase of 18.64 per cent over the previous year, while operating expenses, which were $3,805,565, were 23.38 per cent more than in 1919. This increase absorbed practically all of the gain in earnings due to advances in the price of coal, material and labor.

The tax rates were raised in 1920, so that the average rate on the entire system was $1.85 as compared with $1.26 in 1919. The result of this was that the amount paid out in taxes for the year increased 18.96 per cent.

The total amount spent for maintenance was $1,314,192, compared with $1,059,898 in 1919. The greater proportion was for maintenance of way and structures, which amounted to $694,274, an increase of $210,920 over the previous year. The total railway maintenance was $1,135,761 as against $946,122 in 1919.

Some idea of the amount of traffic handled can be had from the following statistics: During the year 9,719,308 passengers were carried on the interurban lines and 19,671,918 on the city lines, making a total of 29,391,226 passengers of all kinds. The freight tonnage handled was 134,342 in addition to 116,292 tons of express matter. The car-miles operated on the interurban lines amounted to 5,837,378 and on the city lines 3,424,961. The coal consumed at the power station was 261,239 tons, while the kilowatt-hours generated at the main power station were 118,527,211. The company operates 435.64 miles of main line, of which 33.21 miles are so-called city lines.

$19,628 Earned on $3,576,740 Investment

The annual report of the Bamberger Electric Railroad recently filed with the Public Utilities Commission of Utah shows a net profit of $19,628 from operation on an investment of $3,576,740 in its 35.94 miles of road, running between Salt Lake City and Ogden, Utah.

The report shows that the company had on hand at the beginning of the year accredited to profit and loss the sum of $602,327, and at the end of 1920 the sum of $621,955. The increase in the grand total of its assets over the year 1919 amounted to $261,416, or from $3,858,314 at the close of 1919 to $4,119,729 at the close of 1920. Of this latter figure the company claims to have assets of $3,576,740 in road and equipment, an increase of $182,255 over the preceding year and $46,802 in miscellaneous property, or an increase of $17,500 over 1919.

The investments in affiliated companies shows neither increase nor decrease. This amounts to $147,652. In bonds investment the increase amounts to $600, bringing the total investment in bonds to $36,800. The total investment exceeded the 1919 figure by $200,355.

Current assets shows an increase of $61,685 in spite of several large decreases in certain lines, such as a $40,000 decrease in special deposits. Miscellaneous accounts receivable show an increase of $55,068, and the materials and supplies purchased during 1919 add considerable to this figure in compiling the current assets figure.

The sum of $52,083 was invested in road equipment during the year. In addition $1,766 was expended in substation equipment and $2,874 in miscellaneous expenditures, bringing the total expenditures for betterment up to $182,255.

The company has 73.21 miles of tracks at an average investment of $48,856 per mile.

The company holds $75,000 in first mortgage bonds of the Salt Lake & Ogden Railway drawing interest at 5 per cent, which is the only money or security in the sinking fund.

Financial News Notes

Portland Dividend Declared.—The Portland Railway, Light & Power Company, Portland, Ore., recently declared an initial dividend on the Series "A" first preferred 7½ per cent stock. This payment covers dividends for the period of Jan. 1, 1916, to April 1, 1917.

$3,000,000 Offered in Bonds.—Whitaker & Company, St. Louis, Mo., are offering three-year 8 per cent sinking fund mortgage bonds of the Columbus Railway, Power & Light, Columbus, Ohio. The bonds are dated June 1, 1921, and are due June 1, 1924. The price is 98 and interest to net 8¾ per cent.

Operation of Line Expected.—At a recent conference between Receiver Whysall, his attorney, and W. P. Sturtevant, New York, representative of the bondholders, it was brought out that service may be resumed by the Springfield Terminal Railway & Power Company, Springfield, Ohio. Receiver Whysall, who will plan the reorganization, has given out no statement on this project. The property was sold under foreclosure in June, 1920, for $300,000.

Raleigh Property for Sale.—James H. Pou, Raleigh, and N. A. Sinclair, Fayetteville, N. C., have been appointed commissioners to sell the property of the Cumberland Railway & Power Company, Raleigh, N. C., at receiver's sale on July 2. The company was organized in 1919 and acquired the street railway property in Fayetteville which had long been in disuse. Some months ago a receiver was appointed for the property on the petition of a Lillington bank when interest was defaulted.

Railway Offered to People.—At a recent meeting of the Valdosta (Ga.) Chamber of Commerce the possibility of dismantling the Valdosta Street Railway was discussed. The property just about pays expenses and it was stated that unless the people took over the railway it probably would be junked. Judge Crawford stated that if 100 or more people would take over the railway and work in its interest operating expenses and a small dividend could be paid. The offering price is $15,500.

Eureka Property for $75,000.—The people of Eureka, Cal., will be offered the property of the Humboldt Transit for $75,000, and provision will be made for an additional $30,000 as working capital for the operation of the lines by the city. This proposition will be voted on June 20. The State Railroad Commission recently valued the property at $100,000 but the attorney for the Humboldt National Bank, which represents the bondholders of the railway, announced that the bank had been authorized to submit $75,000 as the valuation of the lines.

Traffic and Transportation

Autos Under Commission

California Railroad Commission Announces Establishment of Automobile Department

So rapid has been the growth of the automobile transportation industry that the Railroad Commission of California has announced the establishment of an automobile department under the supervision of Charles A. Beck. This department will be responsible for all detail work connected with the automobile stage and truck matters, will care for all informal complaints and correspondence, keep time-table and schedule filings, handle applications which can be disposed of by ex parte orders, handle and assign applications requiring public hearing, answer all verbal inquiries, and in general be responsible to the commission for all work in connection with the operation of stages and trucks under its jurisdiction.

Rates, fares and regulations will be handled by the rate department. Issuance of stock, bonds, notes or other securities and the filing of annual or other financial statements will be handled by the department of finance and accounts. The service department as heretofore will look after safety of operation, equipment of cars and the like.

The commission announces that Mr. Handford will be responsible for the formulation of definite lines of policy affecting auto, stage and truck transportation so as to promote uniformity of decisions. Opinions and orders, excepting the minor ex parte orders, will be reviewed and concurred in by Mr. Handford before presentation to the commission for its consideration.

In all matters of accident, investigation and other questions incidental to transportation from the service standpoint, the service department will continue to function through Mr. Handford reporting to the commission as heretofore.

The numerous complaints that come up from competing auto stage lines in regard to irregular operations of some of the auto bus lines have been noticeable at various hearings before the commission during the past year. Recently the Pasadena-Pomona auto stage line filed a complaint with the commission citing the fact that the Motor Transit Company, the largest auto stage operating lines out of Los Angeles, in operating its auto stages between Los Angeles and San Bernardino was violating the terms of its operating franchise rights granted by the Railroad Commission by doing local business on its through schedule. This class of complaint with auto stage lines is frequent with the commission, as many of the stage lines were losing money during the year 1920 and found it difficult to strictly abide by its franchise.

Recently the Burbank Stage Line in applying for an increase in rates informed the commission its losses for the year were $20,000. The Motor Transit Company claimed a loss of $120,000. At a recent hearing of a freight auto transportation line running out of San Diego, where an application had been made to the commission to increase its rates 25 per cent, the commission denied the increase as the manager of the auto freight carrying line could not produce any figures as to his losses, stating that he did not keep any books.

City of Toronto Plans Important Rehabilitation

The Board of Control, Toronto, Ont., has recommended that the City Council pass a by-law providing $7,000,000 for the use of the Toronto Railway Commission in connection with the purchase of the new cars and other equipment by the commission for use next fall when the city takes over the Toronto Railway. H. H. Couzens, Toronto, is general manager of the Toronto Transportation Commission, Ryrie Building, Toronto.

The commission is also planning to construct a new railway through Rosedale and the north limits of the city passing east of Mount Pleasant Cemetery. This line will be constructed if the city opens up certain streets requested by the commission.

The arbitration board has been finally completed which will determine the price to be paid and other details in connection with the acquisition by the city of Toronto (Canada) of the Toronto Railway system upon the expiration of the railway franchise, which takes place next September.

The railway chose Sir Thomas White, former Minister of Finance in the Dominion Government, while the municipality appointed Sir Adam Beck, chairman of the Hydro-Electric Power Commission. These two arbitrators have now agreed upon Hume Cronyn, M. P., as the third member and chairman of the board. Mr. Cronyn is a native of London, Ont. He is prominently identified with a number of financial institutions in his home town.

Transfers Reduced in Size.—The Milwaukee Electric Railway & Light Company placed in use on June 1 on its Milwaukee city lines a reduced-size transfer. The new transfer is 2 in. x 4 in., or 1½ in. shorter than the transfer previously used. The change in size of the transfer was made for the purpose of conserving paper stock.

New Board Attacked

Counsel for Public Service Railway Contends Before Court Evidence Proved Ten-Cent Fare Need

Argument was heard in Part II of the Supreme Court at Trenton, N. J., on June 10 upon the appeal of the Public Service Railway from the decision of the Board of Public Utility Commissioners refusing to grant the corporation permission to charge a 10-cent fare. Frank Bergen and Robert H. McCarter, former attorney-general of the state, appeared for the company. The commission was represented by L. Edward Herrmann, its counsel. The cities, which are opposing the increase, were represented by George L. Record. The court reserved decision.

Mr. Bergen said that the proceedings of the board in recent years had taken a direction and reached a point which not only threatened but seriously affected the fundamental rights of parties interested in utility corporations. He said further that whether or not an existing rate was reasonable was a judicial question. At one phase of the proceedings Justice Trenchard interrupted Mr. Bergen to inquire: "This is really an attack on the utility act by you, isn't it, not on the order of the board in question?"

Mr. Bergen answered that it was an attack on the method employed by the board in the face of overwhelming testimony.

TEN-CENT FARE ESSENTIAL

Mr. Bergen said further that under the present 7-cent fare the company will lose more than $2,000,000 during the calendar year. The commission had failed for several years past, he said, to provide a fare sufficient to meet operating expenses, fixed charges, taxes and depreciation, let alone a return on the company's capital stock of $48,731,600. It was Mr. Bergen's contention that the 10-cent fare would enable the company to pay its taxes, operating expenses and fixed charges, set aside $1,850,000 for depreciation and earn a net income of $1,266,000, or 2½ per cent on its capital stock, provided the rate were granted for a full year.

Mr. Bergen said:

> Disaster to the company is inevitable unless it is afforded the instant relief to which the Court of Errors and Appeals has held it is entitled. It is intolerable that a plain remedy should be withheld by the board for reasons unsupported by either facts or law. The utility act expressly provides for the fixing of a reasonable rate under the conditions that here exist, and the Court of Errors has clearly defined what elements are to be considered. At the hearings the board solemnly declared its purpose to obey the law as laid down by the court (Case, page 364), but when the time for action arrived it reversed its intention. It is indeed fortunate that we have this court of law to which we may confidently appeal.

In opening his case for the municipalities Mr. Record declared that the commission could have withheld its decision until after July 15, when it was bound by law to announce what it considers a just and reasonable fare. By rendering its decision it gave the company opportunity to appeal in this case, thereby delaying valuation proceedings.

Birmingham Situation Critical

Several Months of Operation Prove Seven-Cent Fare Inadequate—Jitneys a Menace

Hearing of an application of Lee C. Bradley, receiver for the Birmingham Railway, Light & Power Company, Birmingham, Ala., for authority to raise fares in Birmingham has been set for June 28 before the Alabama Public Service Commission at Montgomery. Right to increase fares from 7 to 8 cents in Birmingham and its suburbs and to levy a charge of 2 cents for transfers is asked in the petition, which was filed by Mr. Bradley on June 8 before the Public Service Commission. Judge William I. Grubb, of the United States District Court, issued a formal order on June 4 authorizing the receiver to apply for the increased fare.

VIGOROUS opposition to any increase in the present 7-cent fare has been voiced by members of the City Commission of Birmingham, who state that the city will fight the proposed advance to the bitter end. It has been indicated by city officials that the public utilities act, under which the Alabama Public Service Commission is granted the exclusive right to regulate rates to be charged by public utility companies operating in the state, may be attacked in the efforts to defeat an increase in fares.

Heavy decreases in the earnings from the operation of the railway are set up by the receiver as the grounds upon which the increase is asked. In his application he shows that receipts have decreased in spite of the recent raise in rates from 6 to 7 cents.

Operation of jitneys in competition with the railway is given by the receiver as one of the contributing causes for the decrease in revenue from the railway department. However, the general business depression and the unemployment situation are cited as the principal cause for the decrease in earnings.

A jitney regulation ordinance was recently adopted by the City Commission, but has not yet been put into effect. Under the terms of this the receiver maintains that the jitneys are recognized by the city as a competing service. The ordinance as originally drafted provided that all jitneys must furnish an adequate indemnity bond or must carry an adequate amount of liability insurance, but these provisions were killed by the majority of the commission before the final adoption of the ordinance. As adopted it provides certain police and traffic regulations and routes for the jitneys. In some instances they are removed from the railway lines, but in several others the jitney routings are allowed to follow the car lines.

In his application to Judge Grubb for authority to apply for the increases Receiver Bradley reviews at length the financial situation of the Birmingham Railway, Light & Power Company and of the causes which make the increased fare necessary. It is shown that when the application for a 7-cent fare was made the cash condition of the estate as of Nov. 1, 1920, showed a deficit of $1,435,101 with other obligations which increased the total obligations of the receiver to $1,873,822.

The increase in fare to 7 cents, it was estimated, according to the application, would produce approximately $25,000 a month in increased net revenue. The petition shows, however, that in January with the 7-cent fare there was an increase of $32,719 in comparison with January, 1920. In February there was a gain of $25,009 over the preceding February. March showed a gain of $15,779 over the same month of 1920. But April showed a loss of $10,871 in comparison with the preceding April. May showed a loss of $24,007. Pointing to the steady decrease the receiver says:

> Instead of receiving approximately $25,000 a month in increased revenue, we find that in the month of May we have a decrease of $21,007, or approximately $50,000 less than was deemed necessary at the time the 7-cent fare was granted.

This condition, Mr. Bradley states, results from business depression and that all lines are showing decreases in comparison with the figures for last year. Lines upon which jitneys are in operation, he states, are showing very heavy decreases. Owing to the uncertainty of jitney operation the receiver points out that it is difficult to estimate the loss caused but that from checks made they were apparently causing a loss of approximately $700 a day during the month of May. The loss from the business depression was estimated at $900 a day for May.

Although operating expenses, it is stated, have been cut from 32.3 cents per car-mile in December, 1920, to 30.5 cents per car-mile in May, 1921, yet the increased revenue from the 7-cent fare has been more than offset by jitney competition and business depression. Other departments are shown to be making a profit or breaking even.

Fare Restraint Suit Brought

A suit to restrain an increase in fare by the Cincinnati (Ohio) Traction Company on July 1 from 8½ cents to 9 cents was filed in the Hamilton County Common Pleas Court by Saul Zielonka, City Solicitor of Cincinnati, during the week ended June 11. Judge Stanley Struble granted a temporary injunction. The suit, similar to a previous one, was made necessary because under the present franchise of the railway, the company contends it must give notice on the fifteenth of the month where deficits have occurred in operation of its lines.

The company and city officials within the last few days have agreed to changes in the franchise, as a result of which, among other things such injunction suits will be unnecessary in the future. As in the former suits in which an increase in the rate of fares was enjoined by the city, the city solicitor again predicates upon the contention that if proper adjustments are made of credits given to subsidiary companies of the Ohio Traction Company the Cincinnati Traction Company would not have a deficit.

Jitney Regulation in Detroit

A new ordinance has recently been passed in Detroit, Mich., regulating jitneys. The new ruling will compel owners and drivers to furnish surety bonds and to indemnify passengers against loss or injury. Owners must supply a $1,000 bond and pay a $3 license fee for every car operated while drivers must put up a $200 bond. Licenses are revocable at the Mayor's will. The penalty for violation of the ordinance is a $500 fine or a prison term of 90 days. The rule became effective on June 15 and will result, it is believed, in a substantial reduction of such vehicles operated.

Litigation Dismissed in Cedar Falls

At a special meeting of the City Council of Cedar Falls, Ia., on May 31, called for the purpose of further consideration of the long drawn-out fare controversy, a resolution was adopted accepting the Waterloo, Cedar Falls & Northern Railway's proposition. Accordingly the 8-cent cash fare continues until the latter part of August and the city of Cedar Falls has dismissed the litigation and authorized the trustee to turn the balance of the money back to the railway.

The 10-cent fare was established in Cedar Falls in September, 1920, by injunction proceedings in the District Court of Black Hawk County, Iowa. Under an order of court the company was required to issue receipts to passengers requesting the same, covering the difference between a 5-cent cash fare and the 10-cent fare, the money represented by such receipts issued being deposited in the hands of a trustee, to be held as a fund in court for future order of the court. The 10-cent rate was collected under this plan until March 1, 1921. The latter part of February, at a meeting between Manager Cass and the City Council of Cedar Falls, Mr. Cass agreed for experimental purposes to install a 7-cent cash fare rate for the month of March, if they would turn over to the company the money that was in the hands of the trustee represented by the receipts outstanding, in amount of 3 cents per receipt. Further that if the 7-cent cash fare rate did not produce an average gross revenue equal to the average gross revenue at the 10-cent rate for the preceding five months that they would permit an 8-cent fare to be installed on April 1.

The agreement was made, the money was drawn down by stipulation in the District Court, and the 7-cent fare installed. It ran through the month of March and the result showed a 12 per cent increase in travel and about a 16 per cent decrease in gross revenue. On April 1, under the agreement, the company therefore installed the 8-cent cash fare. It ran through the month of April and resulted in a decrease in travel over the 10-cent rate and, of course, a decrease in the gross revenue accordingly.

A series of meetings was held during May with the City Council in an attempt to adjust the whole dispute, and finally the City Council was advised that as a last proposition the railway would continue the 8-cent cash fare rate until the latter part of August, 1921, if the city released the balance of the money that was in the trust fund and dismissed the litigation. Another condition of the proposal was that at the end of August the 10-cent cash rate would be reinstalled if the 8-cent rate did not produce a reasonable return on the investment or equal the average return at the 10-cent rate during the five months that the 10-cent fare was in effect.

As previously indicated, the Council on May 31 accepted the proposition but it did not do so until Manager Cass notified the members that if they did not accept it he would install the 10-cent cash fare rate on June 1 and test the matter out in court.

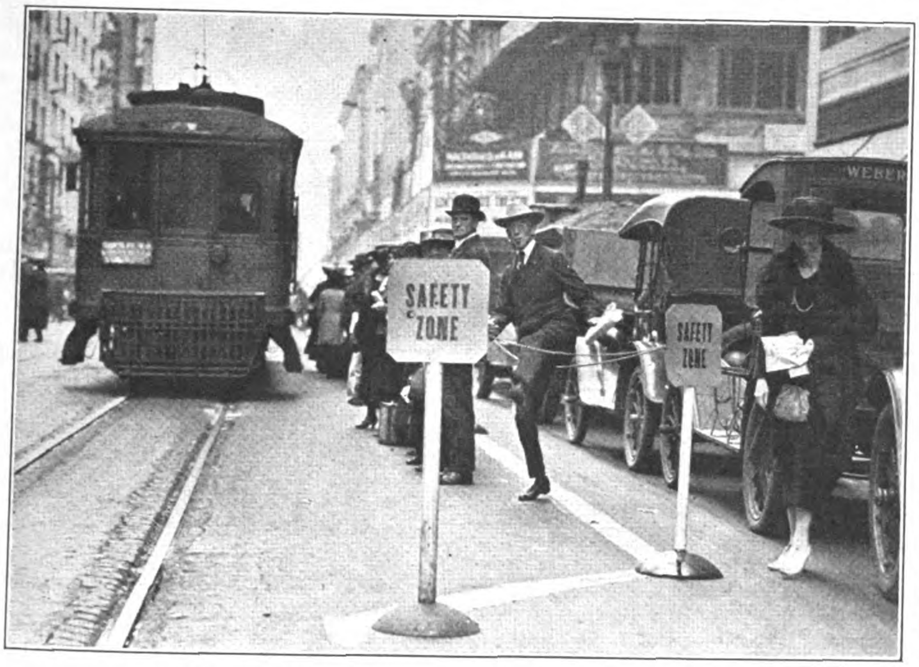
Purchases Equipment—Wins Business.—The Tiffin, Fostoria & Eastern Electric Railway, Tiffin, Ohio, has a contract for hauling about 35,000 tons of stone. The stone quarry is situated adjacent to the company's track. The business was secured by the railway property's purchasing the necessary equipment.

Safety Zone Plan Extended in Los Angeles

Following establishment of a new style safety zone at Seventh Street and Broadway, the busiest point in Los Angeles, Cal., extension of the zone has been ordered by the city.

When the first test was made safety zones were established at the four corners of the intersection 90 ft. long and 4 ft. wide. The zone was marked by white strips painted on the pavement and by chains suspended from stanchions. Entrance to the safety zone was from the front, in line with the property limits.

The zones have been increased in size so that they are now 100 ft. long and 5 ft. wide from the car clearance line. The white-painted strips are to be replaced with white cement strips inset in the pavement. Two chains instead of one, suspended from heavier stanchions, will mark the limits. The zone has room for two cars to load and unload at the front and rear doors and permits the front door of a third car to enter. When traffic is closed, autos must stop in line with the front of the zone.



SAFETY ZONE AS ESTABLISHED IN LOS ANGELES

The plan has proved satisfactory, is speeding up loading of cars and prevents accidents.

Fare Rise in Sault Ste. Marie

The Utilities Commission of Michigan recently issued an order increasing passenger fares on the Sault Ste. Marie Traction Company from 5 to 7 cents, with four tickets for 25 cents. The order went into effect on April 25 and will be in effect until the commission takes a complete inventory and appraisal of the property. The commission in its finding stated that it was convinced that the company was not earning enough money to meet operating expenses.

Transportation News Notes

Increased Fares in Force.—The Ohio Electric Railway, Springfield, Ohio, has placed in effect the new passenger rates authorized by the State Utilities Commission. They are as follows: Columbus to Newark from 90 cents to $1, one way; to Zanesville from $1.65 to $1.80; to Dayton from $1.75 to $2.

Another Five-Cent Line.—New rates of fare and method of operation will be put into effect in East Boston and Chelsea commencing on June 18, providing a 5-cent local fare, without free transfers, in those sections, and a dime fare to and from Boston proper. General Manager Dana of the Boston Elevated Railway has announced this change.

Must File Lower Rate.—The Pottsville Union Traction Company, Pottsville, Pa., has been ordered to file a tariff at the commission office allowing four tickets for 30 cents. The present charge is 10 cents with no ticket fare in effect. Commissioner Rilling decided that the rate was "excessive and unreasonable." The company was also ordered to extend transfer privileges on its Minersville and Yorkville divisions. The Pottsville Union Traction Company is owned and operated by the Eastern Pennsylvania Railways.

Three-Cent Fare on Municipal Line.—According to a statement given out by Councilman Oliver T. Erickson a sufficient number of signatures already returned virtually assure a vote next spring on his initiative ordinance for a 3-cent fare on municipal car lines of Seattle. Petitions have been circulated for some weeks by the Public Ownership League to get voters to sign their approval of the initiative ordinance to be put on the ballot at the municipal election. Councilman Erickson states that while enough signatures have been secured, the petitions will continue to circulate as a matter of education for the people in acquainting them with the plan.

Jersey Railway Carries 9,000,000 Passengers.—The report of Robert G. Fleming, assistant city treasurer of Camden, N. J., and Martin Schreiber, general manager of the southern division of the Public Service Railway, shows that the jitneys in Camden carried 1,429,166 passengers from Jan. 1 to May 1. The Public Service Railway has carried approximately 9,500,000 up to June 1. The jitney owners' receipts for the four months totaled $100,041. Public Service receipts, it is said, equaled $665,000 by June 1. There are 132 jitneys in Camden. The Public Service Railway carries about 50,000,000 passengers each year on the southern division.

Personal Mention

M. R. Bump Heads N. E. L. A.

F. T. Griffith, Portland Railway, Light & Power Company, Elected a Vice-President

Milan R. Bump, chief engineer for Henry L. Doherty & Company, New York, was elected president of the National Electric Light Association at the closing session of the annual convention of that organization in Chicago on June 3. Mr. Bump succeeds Martin J. Insull, vice-president of the Middle West Utilities Company, Chicago.

Other officers elected were: First vice-president, Frank W. Smith, United Electric Light & Power Company, New York; second vice-president, Walter H. Johnson, Philadelphia Electric Company; third vice-president, Franklin T. Griffith, Portland Railway, Light & Power Company, Portland, Ore.; fourth vice-president, J. E. Davidson, Nebraska Power Company, Omaha; treasurer, H. C. Abell, American Light & Traction Company, New York.

M. R. BUMP

The new president is an engineer of broad experience with a sympathetic understanding and appreciation of all phases of the utility business. Milan R. Bump is the fourth member of Henry L. Doherty & Company to become president of the N. E. L. A. Since 1910, except for a few months six years ago when he was vice-president of the Picher Lead Company, Mr. Bump has been chief engineer of the Doherty organization in charge of all engineering and of the construction and operating departments of the public utility division. Later he became a member of the executive committee of the company in charge of the oil transportation, refining and marketing divisions and the natural-gas division.

Mr. Bump was born at Rock Falls, Wis., March 18, 1881. At the age of twenty-one he was graduated in electrical engineering from the University of Wisconsin. In 1904 he became associated with Henry L. Doherty as the first cadet engineer of the Doherty training schools. He served as engineer on several Doherty properties until 1910, when he came to New York to take up his present duties. During his first five years as chief engineer of the Doherty organization Mr. Bump was engaged largely in examining for purchase and revamping many of the utility properties of the Cities Service Company subsidiaries.

In his work of rehabilitating sick utilities Mr. Bump has become a firm believer in the value of good public relations. It is not surprising therefore to find in him one of the most ardent advocates of customer ownership of public utility securities. He is a thorough student of public utility problems even though they be apart from engineering, and through his executive touch with properties in more than half the states he brings to the N. E. L. A. a well-balanced national point of view that should prove of immeasurable value to the electric light and power industry.

Franklin T. Griffith, third vice-president of the association, is a public utility executive who, for a number of years, has fought for water-power legislation that will permit the economical development of Western power resources.

As an attorney he has made great strides in codifying laws governing the development of water powers, and as president of the Portland Railway, Light & Power Company, Portland, Ore., he has been applying his sympathetic understanding of human nature to smooth the way for the utility in best serving the public. When the national water-power laws were being formulated the experience and advice of Mr. Griffith were widely sought, and he gave largely of his energy in constructive thought on this legislation. Then and since, as chairman of the water-power development committee of the National Electric Light Association, he has untiringly worked to bring about far-sighted interpretations of these laws with workable rules and regulations so that the most beneficial results shall be gained.

H. C. Abell, who was re-elected treasurer of the N. E. L. A., is the chief engineer for the American Light & Traction Company, which is the holding company of the Muskegon (Mich.) Traction & Lighting Company, the San Antonio (Tex.) Public Service Company and many light and gas properties.

Attorney Elected President

Jack Beall to Complete Texas Interurbans Left Unfinished by the Late Colonel Strickland

A brief item published last week announced that Jack Beall, former Congressman from Texas, and for the last six years one of the general attorneys for the Texas Electric Railway and other interests of the late Col. J. F. Strickland, has been elected president of the Texas Electric Railway to succeed Colonel Strickland at the meeting of the board of directors in Dallas on Monday, June 6. At the same time the board created a new position, that of chairman of the board, and elected to this post N. A. McMillan, St. Louis, executive manager of the First National Bank of that city and head of the St. Louis Union Trust Company. Mr. McMillan has been closely associated with Colonel Strickland in financing the building of the interurban lines and also in his other enterprises. Two vacancies on the board of directors were filled by the election of C. G. Comegys, of the city of McKinney, and Burr Martin, Dallas.

JACK BEALL

Mr. Beall took over his duties as president of the Texas Electric Railway immediately after his election. He has announced that he would carry out the same general policy that Colonel Strickland had followed, and asked the co-operation of all employees of the company. The first important work left unfinished by Colonel Strickland to be taken up by Mr. Beall is the building of the interurban line to Terrell. Work on grading for this line has already begun, and Mr. Beall says work will be rushed and the line completed as soon as possible.

Mr. Beall is a native Texan, having been born a few miles west of Waxahachie on Oct. 25, 1866. He was educated in the country schools of that district and later taught school for several years before he entered the University of Texas in 1886. He was graduated from the University of Texas in 1890, taking his degree in law. He then entered the practice of law at

Waxahachie and was elected to the Texas Legislature in 1892 and to the State Senate in 1894. Mr. Beall was elected to Congress in 1902 and served continuously as representative of the Dallas district until March 4, 1915, when he resigned to take over his duties in the legal department of the Texas Electric Railway.

Appreciation of Mr. Brooks Shown at Testimonial Dinner

Frank W. Brooks, retired president of the Detroit United Railway, was given a testimonial dinner at the Detroit Athletic Club on the evening of June 8. About 600 officers and employees of the company, among whom were present several who have been with the company over thirty years, expressed their appreciation of Mr. Brooks. As tangible remembrances, the employees presented their resigning leader with a grandfather's clock, a diamond ring and an engraved testimonial, which recites Mr. Brooks' personal merit and his efforts in behalf of the company.

Besides selected guests, Elliott G. Stevenson, counsel for the D. U. R.; Alex Dow and John C. Donnelly, directors; Allen F. Edwards, acting president; J. C. Hutchins, chairman of the board, and E. J. Burdick, assistant general manager, were seated with Mr. Brooks.

F. W. Miller has been appointed superintendent of the Hartford Division of the Connecticut Company, the place made vacant recently by Nathaniel J. Scott when he succeeded the late Warren P. Bristol as manager. Mr. Miller has been with the company thirty years and has worked his way up to his present position. John A. Kiely, who began twenty-five years ago as a motorman and was successively inspector and chief dispatcher, has been appointed assistant superintendent. William W. Melaven has been made general barn foreman. These are the appointments of Manager Scott.

Edward C. Connor, who has been chief engineer to the supervisor of public utilities of the city of Dallas, Tex., tendered his resignation on May 1. The resignation was accepted by John W. Everman, supervisor, but an appointment to the vacancy has not been announced. Mr. Connor is one of the best known civil engineers in Dallas and his work as chief engineer to the supervisor of public utilities has covered valuation of the traction company's lines in connection with the company's application for a fare increase, negotiations looking toward the drafting of a new franchise for the Dallas Railway and the carrying out of the commitment of the traction company in connection with the building of another interurban line into Dallas, which was recently begun and which will extend to Terrell. It is rumored that W. J. Powell, former city engineer, will be tendered the place.

W. O. Wood President

Queens County Railway Official Elected at New York Meeting Last Week—Eighteen Years in New York

At its annual meeting at Lake George on June 11 the New York Electric Railway Association elected as president one of the best-known railway men in the country. This is William O. Wood, whose fund of humor is equally well recognized with his ability as a railway operator. Mr. Wood is president of the New York & Queens County Railway, a position which he has held since 1908. He is also vice-president and general manager of the Long Island Electric Railway and the New York & Long Island Traction Company. All of these properties are affiliated with the Interborough group in New York.

Mr. Wood succeeds T. C. Cherry, vice-president and general manager of the Rochester & Syracuse Railroad, as head of the association. Mr. Wood has long taken an active and forward participation in the work of the state body and his election to the office of president is a recognition of his services and interest in behalf of the organization. During the past year he served as first vice-president of the New York Association.

W. O. WOOD

Mr. Wood began his electric railway experience in 1900 when he was appointed general superintendent of the Rapid Railway in Detroit. From that city he went in 1903 to Brooklyn, where he became superintendent of the elevated lines of the Brooklyn Rapid Transit Company. The following year he was appointed assistant general superintendent of the company. In 1907 he resigned to become associated with the Interborough Rapid Transit Company and for a year was engaged in special work, reporting to President Shonts.

Mr. Wood was born in Evansville, Ind., and prior to being connected with the electric railway industry was for a time with the Louisville & Nashville Railroad, then with the Flagler lines in Florida and later with the Illinois Central Railroad.

Obituary

Judge Ira B. Mills, chairman of the State Railroad & Warehouse Commission of Minnesota, and a former president of the National Association of Railroad & Public Utility Commissioners, died in St. Paul on May 4 at the age of seventy. Judge Mills was the oldest public utility commissioner in the United States in point of service, having been in office since 1893.

James O. Ellis, manager of the Chelsea Division of the Eastern Massachusetts Street Railway, died on June 9. He was 51 years old. He was born in Brooks, Me., Aug. 19, 1869, and began railroading as a driver of horse cars on the Lowell division of the Lynn & Boston, the former name of the Eastern Massachusetts Street Railway. He became an inspector and finally rose to the position of superintendent of the Reading Division. Nine years ago he was made superintendent of the Chelsea Division, succeeding George H. Gray, who was made general superintendent. The Chelsea Division includes lines in Revere, Chelsea, Malden and Melrose.

William W. Magoon, formerly general manager of the Ohio Valley Electric Railway, Huntington, W. Va., and one of Huntington's most prominent citizens, died recently in Kenova. Mr. Magoon went to Huntington about thirty years ago from Vanceburg, Ky., to build an excelsior plant, but later became identified with the Camden Interstate Railway. He was general manager of the Ohio Valley Electric until about five years ago, when he resigned because of ill health. He was also secretary and treasurer of the Blue Jay Manufacturing Company, which is one of the largest overall manufacturing concerns in the world. He was also secretary of the Huntington Credit Men's Association. He was one of Huntington's most active workers and boosters, and he devoted much of his life along those lines.

Edgar M. Graham, consulting engineer in Muskogee, Okla., was killed May 14 in an automobile accident. For more than ten years Mr. Graham was chief engineer of the Muskogee Electric Traction Company. He built during this time about 10 miles of the Webbers Falls Railway. In 1900 he became assistant to Guthrie & Diehl, consulting engineers, Buffalo, N. Y. The following year he went with the New York Central Railroad and then was with the Lackawanna Steel Company for two years. In 1905 he became chief draftsman for the Buffalo & Susquehanna Railway, and in 1907 was made assistant chief engineer. He entered private practice in Buffalo in 1908. Mr. Graham was forty years old. He had long been active in engineering society affairs.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Crossarm Buying Shows Some Increase

Greater Demand May Be Due to Lower Prices—Cut of 10 per Cent This Month

Whether it is due to recent price decreases or not is uncertain but producers report that buying of crossarms shows quite an increase of late. This increase in demand is not noted in the electric railway field, however, as it centers around central station buying. Demand is still far from normal but producers are encouraged that it should show up as well as it does.

There may be some connection between current buying and the price situation for on the first of this month a general cut on longleaf yellow pine crossarms was made amounting to about 10 per cent. Fir crossarms were not affected by the drop. This is not the first price decrease on crossarms this year as a cut amounting to 15 per cent was made on Feb. 1 and another varying from 9 to 15 per cent on March 1. These covered both fir and pine arms.

Stocks are reported to be good with immediate shipments prevailing. Producers are optimistic that the market will open up considerably more during the latter months of the year.

Stocks of Waste Are Not Extra Large

Textile Mill Shutdown Has Curtailed Supply—Prices Are Down, but Buying Shows Little Improvement

With textile mills either shut down or very nearly so for several months past it is doubtful if there is a very great surplus of waste in the country. The raw material of waste is a by-product of these mills and, furthermore, waste manufacturers have held their stocks down in line with current business conditions. At the present time deliveries are immediate but only because demand is low and orders too small to push shipments. There has been a slight improvement reported in the textile situation in New England recently but operation there is still very spasmodic, and it is a question whether or not an increase in demand would not push deliveries on waste.

It seems unlikely that any such increase in buying will materialize for some time, however; not before the last quarter, producers think. The general market situation is quiet with railways buying from hand to mouth and industrial demand, which is usually very considerable, flat. One producer at least reports slight signs of increased activity but others do not confirm this.

Competition is very keen and prices are down accordingly. Within the past month quotations have been lowered one cent per pound at least. Current quotations from several waste manufacturers in lots of 100-lb. bales show on white cotton waste a range of 7 to 12 cents per pound; on colored a range of 5½ to 10½ cents, and on wool waste the price varies from 8 to 17 cents.

Recent Price Cut on Pole Line Hardware Not General

Buying Shows No Reaction, Although Three Reductions Have Been Made This Year—Deliveries Are Immediate

Although one producer of pole-line hardware has just made a 5 per cent price reduction effective June 16, and a large manufacturer's distributer reduced the price 5 per cent about a week ago, there has been no general recent decrease so far as can be learned. Manufacturers in this line have apparently reached the conclusion that price cuts will provide absolutely no stimulus to buying, consequently reductions represent lower costs and nothing more. Three general price cuts have been made since the first of the year and buying has shown little or no reaction. The first cut of 5 to 15 per cent was made in late December and early January, the second of 5 to 7½ per cent on Feb. 15 and the third from 7½ to 10 per cent occurred on April 11.

At the present time there are a few orders and inquiries coming in from central stations but none from electric railways. Stocks have been reduced, one producer who had $500,000 worth of goods on hand earlier this year having cut this down by one-third now, but deliveries are mostly immediate and not longer than one week at the most.

150 More Cars for Detroit

In line with the tremendous construction program under way on the municipal railway system of Detroit, Mich., the city has advertised for bids on 100 safety cars and fifty double-truck Peter Witt cars. Bids are to close on June 28, the company advises. On Nov. 16, 1920, the railway ordered twenty-five safety cars from the Osgood-Bradley Car Company and on April 15, 1921, purchased twenty-five additional safety cars from the same concern. An order for rails and kindred material which the city placed last month, totaling about $800,000, was mentioned in the May 21 issue.

Bituminous Coal Production Holds Up Well

Current Average of 8,000,000 Tons Weekly More Than Present Light Demand Can Absorb

Possibility of a shortage of bituminous coal materializing this fall seems more remote in view of the consistent maintenance of current output. For the past four weeks production has proceeded at the rate of 8,000,000 tons per week according to the Geological Survey, or about 2,000,000 tons above the low point reached early in April. Incidentally this rate of output, *Coal Age* states, is considerably more than can be absorbed under present industrial conditions.

Buying has been restricted to the barest needs, though some forward contracts have been closed. Consumers are still holding off under hopes of lower freight rates and reductions in the price of coal, and this policy is encouraged by the facility with which needs can be filled. It is stated that there will be no general reduction on coal freight rates this year, however. The Secretary of Commerce this week gave it as his opinion that nothing will come of the negotiations between the administration and the railroads looking to a reduction of freight rates on coal. There may be local changes, of course, but they will be made only by rate hearings and after considerable delay.

EXPORT BUYING LIGHT, WITH END OF BRITISH STRIKE NEAR

The export market is dull at the present time as purchasing on British account has slumped in anticipation of an end of the coal strike in Great Britain next week. As a result of the weak condition of the steam coal market prices have further eased off recently. The index of spot coal prices of *Coal Age* declined to 95 on June 14, the lowest figure touched this year. This number represents all prices reduced to one figure and compared with the average government price of 1918 which is taken as 100. The first of the year this index number ranged around 130 but since February it has remained in the neighborhood of 100.

Labor costs at the mines are as yet undiminished. All efforts to open discussion with the United Mine Workers for wage reductions have thus far failed and no prospect of a cut in union wages can be seen this summer. Further than that, of course, the situation is uncertain. Meanwhile, non-union coal produced at lower wages continues to offer keen competition to union coal in the eastern market.

New and Scrap Steel Market on Lower Level

Price Reductions of from $3 to $5 on New Steel Products Fail to Move Much Material

It is felt that the iron and steel trade is operating on a level that is about as low as it can go. A figure of 25 per cent will just about indicate the rate of operation of Corporation and independents together, a figure 5 points lower than it was a week or two ago. With a generally lower volume of business this past week the general tone of the market is softer and some definite price reductions in certain steel lines have been noted.

Iron bars are off 13 cents a hundred pounds to $2.25 and in New York the reduction is 15 to 20 cents to $2.23 to $2.28. Steel bars at Pittsburgh are holding at 2.10. In the sheets black, Pittsburgh, is down $3 a ton to 3.85 and blue annealed is down $4 to 2.90. On plain wire quotations are now 2.75 and on galvanized barbed 3.85 cents, $5 a ton lower than recent prices. Malleable at Chicago is 50 cents lower at $22.20 per gross ton while Pittsburgh bessemer is $1 lower at $24.96. Prices are being shaded on track spikes, quotations on which are $3.40 base, Pittsburgh. Base on track bolts is $4.35, and here too is some shading, probably of $3 per ton.

Since June 7 the scrap iron and steel market has dropped from 50 cents to $1. Old steel axles are $1 lower to $13.50-14.00 and No. 1 cast is $1 lower to $13.00-13.50, all in net tons, Chicago. Old iron axles are steady at $24-25. In gross ton lots, Chicago, 50-cent reductions have been applied to car wheels, bringing them to $13.50-14; R.R. malleable, which is now $13.50-14; frogs, switches and guards, which stand at $11-11.50; old steel rails, short, which are quoted at $12.50-13, and rerolling steel rails, $13-13.50. Buying in this market is extremely quiet.

Insulation Makers Optimistic Despite Light Buying

Good Price Declines of the Past Week Bring Total Decline Since First of Year to Large Figure

Quietness is still the prevailing feature of the electrical insulation market. Repair shops are buying hand to mouth, for most of them are not busy. Industrials are operating at reduced capacity, and furthermore they ordered ahead when deliveries were long so that little buying is being done in that quarter. Electric railways are endeavoring to get along on such insulating material as they have and buy only for immediate needs, and as the appliance industry has been slack for a long time, small motor manufacturers are not active. One of the latter, for instance, recently bought 15 lb. of mica where a normal order formerly totaled 100 lb.

The general outlook is held to be far from discouraging, however. The very fact that motor manufacturers, electric railways, etc., are not stocking insulation means all the more potential business yet to be placed, and as it seems there is not a great volume of repair work being done insulation needs along that line are piling up. Just when this business will break is, of course, a question, but the majority of producers are not expecting anything much to develop in the way of increased business before the first of September.

Buyers apparently do not yet have confidence in present prices despite the radical reductions which the latter have undergone. Prices are still declining, it is true, but it is possible this is largely a result of conditions of keen competition. Since the first of this year, according to one of the large producers, cotton tapes, webbings and sleevings have declined 70 per cent, 25 per cent of this drop occurring just this week; varnished cloths have declined about 28 to 35 per cent, one-fourth of which decrease also was made this week; cotton armature twines, except linen, are down 33⅓ per cent and insulating varnish about 20 per cent. India mica up to the present is undiminished in cost as the price at the mines has not been reduced, but the South American product is now somewhat lower.

Conditions of stock vary considerably, though all producers are pursuing a policy of keeping down inventories and only producing on order. Deliveries of standard material for the most part are immediate, as in general stocks are too large rather than too small under present buying.

Schedule Material Prices Marked Lower Last Week

From about the ninth to the thirteenth of June the various manufacturers of schedule materials increased some of their discounts and lowered certain list prices so that the general result was a decrease in prices averaging around 10 per cent in standard-package quantities. With this general easier price, however, it can hardly be expected that any great amount of business will be stimulated, for the building construction outlet is not yet in a condition to absorb any large amount of schedule material and wiring devices.

Fuse Prices Down 11 to 17 per Cent the Past Month

With the recent price reductions announced on non-renewable fuses by several manufacturers, quotations on both this type and on renewable fuses are now down. Effective the middle of May, leading manufacturers reduced prices on renewable fuses approximately 17 per cent by increasing the discount allowed to distributers 10 points.

Non-renewable fuses were not affected by this drop, however, but the first of this month reductions were made by a couple of manufacturers. Other producers have since then taken similar action, until with further decreases that did not come through until last week non-renewable fuses may be said to have been generally reduced from 11 to 16 per cent this month.

Hydro-Electric Development Proposed for Jamaica

Plans are under consideration at present for the construction of a hydro-electric plant in Jamaica, to cost about £614,740. The present plans provide for a 6,000-kw. development, to include the erection of three power stations equipped with a water turbine directly connected to a three-phase alternating-current generator. Transmission will be both by underground cable in one section and by overhead lines to a main line along the railway. The project also includes the electrification of the railways on the island.

Franchises

Galesburg Railway, Lighting & Power Company, Galesburg, Ill.—The Galesburg Railway, Lighting & Power Company has been granted a franchise to construct, maintain and operate a street railway on South Henderson Street from Knox Street to Monmouth Boulevard. The new franchise will help the company to connect its interurban lines. Work on the new extension has already been started.

Track and Roadway

Tri-City Railway, Rock Island, Ill.—The Moline City Council has instructed City Attorney James M. Johnston to petition the Illinois Public Utilities commission to issue an order compelling the Tri-City Railway to put in new tracks on Fifteenth Street from Eighth to Twenty-fourth Avenues, so that the city may advertise for bids for the paving of the street with brick, with the assurance that the railway will not hold up the work, by refusing to put in new rails.

Southern Indiana Gas & Electric Company, Evansville, Ind.—An agreement has been reached by the Southern Indiana Gas & Electric Company at Evansville, Ind., with the city whereby the company will improve three streets in that city, according to a recent announcement of Mayor Benjamin Bosse, of Evansville.

Interstate Public Service Company, Indianapolis, Ind.—The Indiana Public Service Commission has refused to declare unreasonable an ordinance passed by the city council of Shelbyville ordering the Interstate Public Service Company, Indianapolis, Ind., to make improvements and extensions. The company has appealed to the commission to disapprove the ordinance.

Public Service Railway, Newark, N. J.—The Public Service Railway has been asked by the City of Burlington, N. J., to lower its tracks through the entire city in order that street paving might be started. The work of lowering the tracks will require some time.

Interborough Rapid Transit Company, New York, N. Y.—The new Rapid Transit Commission, New York, N. Y., is preparing plans for the extension of the Queensboro subway from Gilroy Avenue and the Willets Point Boulevard, Corona to Main Street, Flushing. The Board of Estimate has already authorized the extension of the Corona line from the present station at Alburtus Avenue, Corona, to the new storage yards.

Columbus, Delaware & Marion Electric Company, Columbus, Ohio.—The Columbus, Delaware & Marion Electric Company has secured permission from a majority of property owners in Indianola Avenue to lay double tracks for a distance of 800 ft. to Oleantangy Street. The Council is expected to act on a 20-year franchise ordinance permitting the work.

Johnstown & Somerset Railway, Somerset, Pa.—Work will be resumed on the construction of the Johnstown & Somerset Railway which was suspended during the war though six miles had been completed. The line has been operating for a year. In view of the reduced cost of material and labor the board of directors has decided to push the project through. Four miles from Holsopple to Jerome will be finished within 90 days. Engineers are busy now on the line from Jerome to the Lincoln highway via Boswell.

Montreal (Que.) Tramways. — The Kelly Street extension of the Montreal Tramway service will be completed shortly, and the new service from Ahuntsic station to the Canadian Pacific Railroad at Bordeaux will be commenced early in June.

Tacoma Railway & Power Company, Tacoma, Wash.—Frank R. Spinning, ation earning basis, and that the city State Department of Public Works, has announced that he will do all within his power to see that the College of Puget Sound is provided with street car service, urging that the line be obtained by friendly and co-operative means. The Tacoma Railway & Power Company, through Manager Richard T. Sullivan, proposed that the company will build the extension, if the city will remit gross earnings tax to the amount of any deficit that occurs in the operation of the line, figured on an 8 per cent earning basis; and that the city relieve the company of its paving obligations on Portland Avenue when that street is paved. Mayor C. M. Riddell pointed out that the city charter absolutely prohibited the Council from agreeing to any such proposition.

Power Houses, Shops and Buildings

Terre Haute (Ind.) Traction Company.—The Terre Haute Traction Company is preparing to ask the Public Service Commission for permission to finance a $500,000 enlargement and extension of the Water Street power house. The report adds that an imposing $200,000 traction terminal for Terre Haute is also in mind, for which plans have been prepared some time. Under a recent grant of increased rates the company contracted to spend all of the additional income provided in betterments. The new power generating machinery here will be the first step toward complying with this contract, and the terminal station will come along soon after.

New York, Westchester & Boston Railway, New York, N. Y.—Plans are expected to be filed with the Public Service Commission of New York by the New York, Westchester & Boston Railway providing for establishment of a new terminal at 129th Street and Third Avenue, which will cut 15 minutes off the running time between Westchester villages and downtown New York. A through express service to lower Manhattan will be available under the plan by connection with the Third Avenue L at 129th Street.

Trade Notes

The Clark-Hunter Company, Inc., 161 Summer Street, Boston, is now manufacturing the Duwell motor-driven bench grinders at its Worcester factory.

The American Metal Molding Company, Newark, N. J., is now producing a full line of conduit elbows in addition to its flexible armored conductor and metallic flexible conduit. Sufficient factory capacity also is available to turn out special press work for the commercial trade.

The Schiefer Electric Company, 614 City Bank Building, Syracuse, N. Y., has been appointed to represent the Condit Electrical Mfg. Company, Boston, Mass., handling its complete line in the vicinity of Syracuse and the eastern part of New York State exclusive of New York City.

Power Specialty Company, 111 Broadway, New York City, manufacturer of Foster superheaters, economizers, and oil stills announces that it is just completing the expenditure of about one-half million dollars in the enlarging of its works, including new steam power plant and new forge shop.

The Westinghouse Electric & Manufacturing Company has announced the opening of its service department and repair shop at 1535 Sixth Street, Detroit. It is a five-story building and similar to the sixteen buildings erected in the principal industrial centers of the United States for repair purposes. The new repair shop is equipped to handle the designing and manufacture of all types of switchboards in the same way as they would be handled at the main works, and in addition dipping tanks and baking ovens are available. Stocks of repair parts are carried. The company's engineering organization, it is stated, is prepared to install or repair electrical or steam apparatus on the owner's premises.

Ohmer Fare Register Company, Dayton, Ohio, states that there is a continuously increasing demand for Ohmer register service on city lines. Among recent large contracts placed with the company is an order from the Georgia Railway & Power Company, of Atlanta, Ga., for equipping its entire city property with 418 Ohmer No. 3 type, time-feature, totalizing registers and rapid transit operating equipment. This corporation has also given to the Ohmer Company other contracts for equipping its interurban divisions with registers. The Shreveport (La.) Railways Company has likewise placed a long-term contract for the installation of 44 No. 3 type, time-feature, totalizing registers with rapid transit operating equipment for use on all of its city lines.

New Advertising Literature

Steam Separator. — The Griscom-Russell Company, 90 West St., N. Y. City, has issued bulletin No. 1140 describing its "Stratton" steam separator.

Damper Regulator.—The Atlas Valve Company, 282 South Street, Newark, N. J., has issued bulletin No. 5, describing its Victor damper regulator No. 3, high-pressure.

Headlights.—The Electric Service Supplies Co., Philadelphia, Pa., has issued a limited number of copies of its new engineering report, No. 351, on glass reflectors for headlights.

Electric Drill.—The Louisville Electric Manufacturing Company, Louisville, is distributing a circular covering its No. 3, two-speed, and No. 2, single-speed "Universal" electric drills.

Arc Welding.—"Electric Arc Cutting and Welding by Alternating Current" is the title of a new fifty-two-page publication of the Electric Arc Cutting & Welding Company, Newark, N. J.

Belt Conveyor Idler.—C. W. Hunt Engineering Corporation, 143 Liberty St., N. Y. City, has issued a folder describing its new self-aligning, all-steel, troughing, belt conveyor idler.

Bench Grinder.—The Clark-Hunter Company, Inc., 161 Summer Street, Boston, is distributing a four-page leaflet describing the "Duwell" motor-driven bench grinder.

Electric Welders.—Bulletin No. 1 issued by the American Electric Fusion Corporation, 1906 North Halsted Street, Chicago, describes its type "VW" vertical welders.

Multi-Phase Renewable Fuse. — The Federal Electric Company, Chicago, has developed a multi-phase time-limit renewable cartridge fuse designed to prevent polyphase motors running single-phase.

Electric Hoists.—The Electric Hoist Manufacturers' Association, 165 Broadway, N. Y. City, has issued an illustrated bulletin on "Approved Applications of Electric Hoists," with a separate bulletin inclosed entitled: "Monorail Runway Construction."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor

Volume 57 New York, Saturday, June 25, 1921 *Number* 26

Government Reorganization Plans Show Signs of Life

PRESIDENT HARDING and his committee on the reorganization of the executive branch of the government appear to be making progress in formulating concrete plans and recommendations to present to Congress. Latest reports indicate that the President's principal recommendation is that bureaus and agencies be grouped according to their major purpose and that the purpose of each department be clearly defined. The committee says that it is already working along this line and reports of its own plans indicate that it has gone straight to the point and suggested a concrete grouping which is logical and which really is according to the President's definition.

All this is good. But it is a long way from such a proposal to an enacted law. The public must express itself, meanwhile, if results are to be obtained. As previously pointed out in these columns, pressure from his constituents is the most determining influence on a Congressman's vote.

This subject should be watched and pressure exerted when and where it will do good. The electric railway industry should benefit as much as any from the effects of an enlightened public consciousness of better economy and efficiency in governmental business. More important, this is the sort of thing that should be done and it deserves active support from individuals who should write to their Congressmen urging *action.*

The Bus, Like the Early Railway, Develops New Territory

TERRITORIAL expansion of communities can be accomplished only by some means of universal transportation. In the early '90s this was the field to which the promoters and developers of the modern, present-day electric railways directed their energies with so much success—not, perhaps, in the way of profit to themselves, but certainly in advancing the welfare of the community. They could not foresee the increased costs that have been placed upon these railways in the past half decade, either rendering them barely self-supporting or actually putting them on the scrap pile.

The large investment needed today to build railways precludes much if any extension until these construction costs can be reduced. But that transportation where it is needed will be furnished somehow, by individual operators or otherwise, is obvious when the many bus routes in the country are studied.

In this issue mention is made of a real estate development in Akron, the success of which depended solely upon having means of transportation. In order that the home owners in that territory might be able to get back and forth to their work and pleasure with some degree of ease and without walking a half mile or more to the nearest trolley car line, it was but natural for the promoters of the new addition to solve the problem themselves.

Thus it will go—when the need for transportation arises. The same form of development will occur in the '20s as did in the '90s. Transportation promoters will not, however, in this day and time put in the most expensive installation, but will carefully analyze the cost of doing business and will install that form of system which will give the greatest service at the minimum of expense. It may, at first, be a light-weight bus on a leisurely schedule; later on, a more elaborate bus proposition or a trackless trolley car, and then, when traffic becomes permanent and stable enough to warrant a larger investment, the trackway will provide the route.

Stand Up for Your Legal Rights, but First Educate the Public

THIS was the advice given to the managers of the New York State electric railway properties at their recent annual meeting by Judge John A. Barhite, formerly Public Service Commissioner of the State. According to the speaker the utility companies are apt to forget that their chief obligation to the public is to supply good service. There is a power, he said, which can change a franchise when constitutional rights are involved. This power, of course, may be exercised to protect either party to the contract.

This advice of Judge Barhite should not be overlooked. Railway men are too accustomed to think of a franchise rate as unchangeable, no matter what the conditions are under which it was granted or the time which it was supposed to run. In this impression, of course, they are like the public. There are a great many citizens who consider a franchise rate, at least when it is low, as sacrosanct. In no circumstances, according to them, can it be changed without the consent of the people served or their local representatives, no matter how long ago the rate was made or how conditions have changed since it was established.

In the address at the Lake George meeting to which reference has been made the speaker very wisely pointed out the duty of the utility operators, where cases of unremunerative rates exist, to explain to the public the rights of the utility in cases of this kind. A process of education of the public in cases of this kind is highly desirable. This explanation of the facts of the case should not be left until a crisis arises, as the process is one requiring time. This time should be shorter, however, than formerly, because of the many instances of rate increases during the past three or four years throughout the country, so that the public is better informed now of the legal status of rates.

While the legal situation was clearly defined at the Lake George meeting, railway companies should also realize that while, in certain circumstances, courts and commissions can raise rates, their power in one respect is very definitely and absolutely limited. They cannot compel the people to take the service at the charge permitted. For example, in transportation, when the rates are considered too high, the public or a portion of it has the option of walking and perhaps of riding in jitneys and private automobiles. In other words, on many properties the legal limits are not the only ones which control a fare. Commercial considerations must also be taken into account. This affords still another reason for the educational program of publicity urged by Judge Barhite.

Eyes Are Again on Richmond; This Time the Trackless Electric Car

IT IS a marked coincidence that the trackless trolley exhibited at Schenectady on June 15 should be destined for Richmond, Va., where the first commercial electric line in this country was put into service. The trackless trolley is not new, as it has been operated to a considerable extent in foreign countries, but the rapid development of the automobile on the one hand and of the safety car on the other has made it possible to design a modern machine of this type that has great possibilities. In the trackless trolley vehicle that was exhibited at Schenectady is found a bus that is a combination of the good things of both the automobile and the electric railway car. By adopting the automobile chassis it is possible to eliminate expensive track construction and paving with its steel rails and fixed way, along with the weight and objectionable noise of metal wheels and grinding brake shoes. By adopting the pay-as-you-enter safety car body there is retained its desirable features in handling passengers and collecting fares. By adopting the electric motor as the drive no new maintenance problems of gasoline motors, with their clutches and transmisions, are introduced. And this is not all; the Schenectady trolley bus will, it is said, operate at a cost at least as low per car-mile as any automobile bus or electric car yet developed, and it is, therefore, economically sound.

Now what is the field for this new trackless trolley? There is of course no ground to assume that it is going to replace the electric car or the gasoline bus under all conditions, but its practicability for new extensions and feeders to electric lines is at once apparent to all. Then there are those thousands of communities in this country that have grown faster than the electric railway facilities. There are also those communities whose growth has not been in the directions anticipated. It is not unusual to find examples in which a car track may be on one side of a town, which was the proper place for it when first constructed, but now all the development has taken place on the other side. Simply by the erection of a pole line and trolley, the trackless trolley may be run through the newly populated section and then over the route where there are already tracks and the original trolley line; in fact, the trackless trolley car may be sandwiched right in with the regular cars. Again, there is the single-track line that should have more service, but on which it is impossible to put any more electric cars on account of the lack of the necessary turnouts. Maybe the expense is too great to make it pay to install the other track with paving costs added, or it is not possible to get the extra track at all on account of the necessary franchises. But, with the trackless trolley, all that is necessary is to install an additional wire and operate additional service.

No doubt there will be improvements made on the trackless trolley as shown at Schenectady on June 15. But the fundamental idea is sound and the trackless trolley bus will undoubtedly be a factor in the transportation of the future.

Patrons Converted Into Defenders of Road

CONTROVERSIES often rage over trifles. Every commuter knows this. It is borne in upon him from all sides. It is his pride in his home town, his pride in his garden, his pride in his isolation, that makes the commuter quick to resent any implication that he and his are not the best. All this is highly desirable, more so when this tendency jealously to guard the things he considers peculiarly his own manifests itself in the defense by the commuter of the railroad that carries him back and forth daily.

This is just what has happened in New York. The Transit Commission there has been giving out figures of passenger movement, claiming for the Flatbush Avenue Station of the Long Island Railroad the heaviest suburban traffic. Last year 33,966,092 passengers passed through that one portal to the metropolis. This is certainly a formidable army of the suburban species, but it does not constitute a record. At least Lewis Saxby says so. And in substantiation this commuter-stockholder-statistician contends that even the combined traffic of the Grand Central Station and the Pennsylvania Station is about 22,000,000 passengers fewer per year than the traffic of the Hudson tubes.

Few places there are that have figures to offer to compete with these imposing and, to some of us, staggering totals, but then, as Dr. Einstein says, it is all a matter of relativity. The relativity may not be readily discernible. It seldom is. If it were, a professor wouldn't be needed to point it out, and the need would not exist for applying to it a term that probably Mr. Edison had to look up for its meaning when the savants dragged it forth into an unsuspecting world. But the relativity is there.

The Hudson & Manhattan Railroad, "Hudson Tubes," has been a personally conducted line ever since the days of William G. McAdoo. This has borne fruit. The case of Mr. Saxby is not an isolated one. It is merely another manifestation of the spirit that makes the rider on this line consider the property to be peculiarly his own.

If Mr. Saxby hadn't thrown down the challenge some one else would have taken up the cudgels in behalf of the railroad. Of this there is no doubt. And how much better it was for the company to have one of its patrons spring to its defense than for the company itself to sing its own praises! Readers of the ELECTRIC RAILWAY JOURNAL may not have any immediate concern with the totals of passengers involved in this controversy, but they do have an interest in the spirit of service behind the Hudson & Manhattan Railroad operation which converts patrons of that line into quick defenders of the road and all that it stands for in management and operation. Therein lies the lesson that may be well learned by others.

Careful Perusal of the Index May Save Waste of Effort

THE index appears in this issue. The publishers of this paper have always paid special attention to the compilation of the semi-annual index, and to insure the receipt of it by every subscriber a copy for each semi-annual volume is bound in with the last number of that volume. In consequence, the index for Volume 57 appears in this issue.

A few words as to the method of compiling the index may not be out of place. It is essentially one of subjects and not of titles. For this reason an article which discusses a number of subjects may have an equal number of entries in the index. Articles relating to individual companies are indexed under the names of those companies and a list of the principal key words which have been used is given in the instructions for the use of the index.

There are many ways in which the occasional reading of back copies of a periodical like the ELECTRIC RAILWAY JOURNAL will help the active worker in the industry and in such reading the index is a great help. One way, for example, especially with an industry which, like that of electric railways, has grown rapidly, is to disclose ways in which different problems have been approached. An engineer or transportation official to whom a problem is presented for solution may think that he is the first to whom this question has been presented, when actually it may have had to be considered in approximately the same form on other properties. This, if recorded in this paper, would be disclosed by the index, and the searcher for the answer to his question would find it had been considered in earlier years. Even if the problem were not the same in all respects, a new aspect and help may be gained by a study of the ways in which previous investigators have attempted to do the same work.

Another advantage of the occasional perusal of back volumes and indices is the perspective of the industry gained thereby. By the space given to different topics in both the bound volume and the index, one may be able without difficulty to appraise the importance which these topics seemed to have at the time. Often those that became relatively unimportant for a time appear again in the front rank, an example of the adage "history repeats itself." Patent attorneys declare that there would often be a saving in time and money spent in research to rediscover old inventions and resurrect old ideas if investigators first made a study of the prior knowledge of the art. This is undoubtedly equally true in the case of subjects and methods which have been found to be not patentable.

Still a third benefit of the practice of using the index and back volumes is to refresh the memory and to acquire information about events and methods the articles concerning which were not read at the time they were published. Whether this was because of a lack of time or opportunity, the result is the same. The quickest way for a person who has been out of the country or otherwise separated from the industry quickly to get an understanding of what has passed is to review the back copies and indexes of periodicals. In fact, any reader who binds his copies of the paper regularly and gets the habit of frequently consulting these bound volumes for specific topics by means of the index or looking over them, even if not in search of some definite data, will find that the numbers possess much of interest and value of which he had hitherto no conception.

Essentially the Interests of the Public and Electric Railway Are Identical

LAST week the Pennsylvania Street Railway Association held its annual meeting at Harrisburg; the gathering was large and the spirit of the discussion was good. However, there was nothing remarkable in the size and spirit of the gathering, as the same might be said, and is said, regarding many other meetings; the remarkable thing was the program. Included in the list of speakers were the president of the American Electric Railway Association (who spoke twice), the chairman and the chief engineer of the State Public Service Commission, the State Librarian, and the field secretary of the State Chamber of Commerce, not to mention some well known electric railway men.

Forgetting for the time being the excellent technical papers which were read and discussed, the industry can gain much from a study of the addresses of these speakers from outside of the association. Abstracts of their addresses as well as of the other proceedings of the meeting will be given in an early issue of this paper. The impressive thing about the whole discussion on public relations was the way in which the fundamental unity of interest of utility and patron is coming to be understood. To illustrate: Chairman W. D. B. Ainey of the State Commission showed in his address that the welfare of the electric railways is a matter of real concern to this regulative body, which is handicapped in its constructive task in part by the contracts which the railways themselves entered into in the early and supposedly palmy days, and by the lack of provision for financial jurisdiction as regards the issuance of securities. Dr. F. H. Snow, head of the engineering department of the commission, also showed a sympathetic interest in the welfare of the utilities, pointing out how intimately the local and national problems in this field are related. President P. H. Gadsden of the American Association, speaking from the railway point of view, demonstrated that in permitting economic conditions to exist which make it impossible for the railways to extend and otherwise improve service the public is hampering its own development. He saw difficulties ahead in the direction of getting new money, but was optimistic with respect to the future, if the public will allow a reasonably liberal and prompt payment of the deferred returns to the holders of securities. Finally, D. M. Casey of the State Chamber of Commerce pleaded the cause of the electric railway as if he had been a railway man himself. His theme was really the essentiality of electric railway transportation, and he presumably reflected the attitude of the modern business man toward this vital public service.

All this is very encouraging, especially if it gets to the ear and eye of the public. The electric railway man may well pass on to his patrons the good things said of the utilities by their own representatives, as well as the inside facts of the business which only the electric railway men themselves know at first hand.

Quotation from the Federal Electric Railways Commission Report

No. 26

WITH capital and labor performing their respective parts freely and well, restrictive regulation would be unpopular, and the demand for the substitution of public ownership and operation for private management would shrink into relative insignificance. The test of private ownership and management lies in the solution of these two problems of credit and co-operation. These problems must be solved, and if no solution is practicable under present ownership and control, then the only course open is the complete transformation of the electric railway industry into a governmental business. Each member of this commission believes that credit can be secured and private operation maintained under public supervision.

Pioneer Trackless Trolley Installation

The Experimental Richmond Trolley Bus Operates in Conjunction with Rail Service to Demonstrate Its Worth and Flexibility and to Compare Costs of Operation Under Like Circumstances—Details as to the Construction of the Bus Compare Favorably with the Modern One-Man Car—A Special Type of Overhead Construction Needed for Its Operation

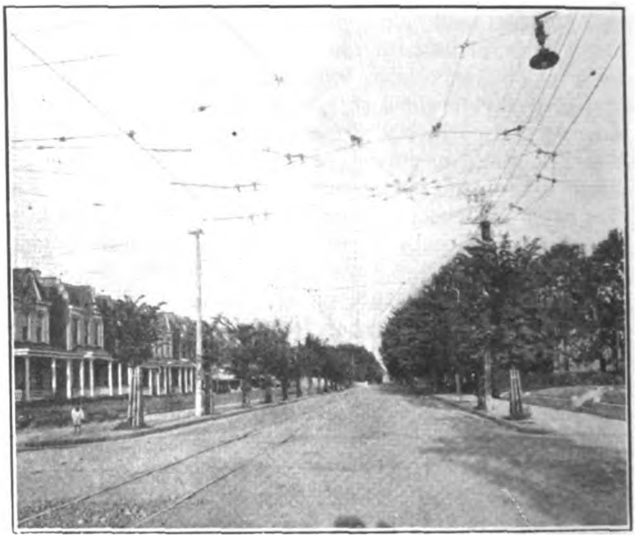
THE trackless trolley bus tested in Schenectady on June 15, as described in the issue of this paper for June 18, has been put in operation in Richmond, Va., by the Virginia Railway & Power Company. In May, 1888, thirty-three years ago, that city saw its first electric car. Now in 1921 the transportation world looks to the same city for information regarding the operation of the trackless trolley.

While this is not the first installation in this country of a rail-less vehicle propelled by electric motors taking power from two overhead wires, it is nevertheless the pioneer installation where a trackless vehicle has been used. The "Trollibus," so called by its builders, the Atlas Truck Company, has a body somewhat similar to that of the standard safety car mounted on an automobile chassis of special design.

The vehicle, according to C. B. Buchanan, general manager of the railway company, who is largely responsible for its design, can very readily be converted to operate over a grounded track return circuit such as is found in almost universal use throughout the country today. To accomplish this it is only necessary to replace the solid rubber tires with steel flanged rims to fit the track gage and substitute for the sliding contact shoes on the trolley a wheel or shoe to take current from the overhead trolley wire.

The machine as built, however, will operate on a track return circuit, even though equipped with rubber tires, by having an adapter, so called, attached to the collector for connection with the standard overhead trolley wire and engage a shoe which fits into the trolley track groove to give the necessary ground connection.

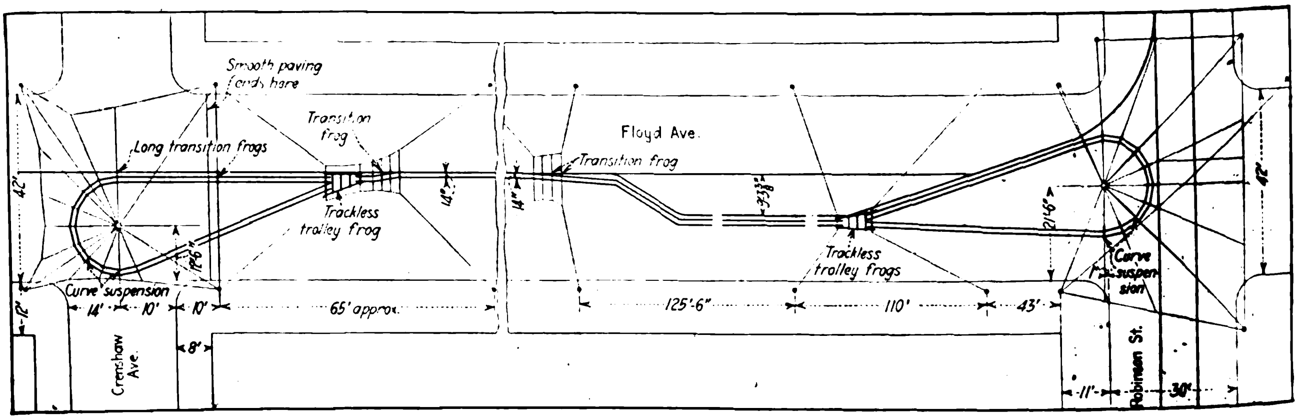
The route in Richmond over which the "Trollibus" operates is purely for determining its possibilities and extends along Floyd Avenue, a street over which the Country Club car line also operates. A negative wire has been installed on this route for a distance of one mile, so that the bus really supplements rail service on that part of the route. Among the reasons for supplementing the car service was to demonstrate the ease with which the rail-less vehicle could maneuver in traffic, as well as to compare its cost of operation and popularity with other transportation units. Cost analyses as to operating expenses are being made from all operating data and a careful check is being kept of the passenger traffic in order to obtain an index as to its popularity. Operation over this route also gives the city officials an opportunity of deciding for themselves whether or not other permanent routes should be approved for operation solely with this type of vehicle.



UPPER END OF BUS ROUTE ON FLOYD AVENUE, RICHMOND, WHERE BUS TURNS BACK

The "Trollibus," which resembles very closely the one-man prepayment car in that each has the same seating capacity, combines several of the good features of light-weight body construction, electric motor drive, mechanical door control and prepayment fare collection with the flexibility of the automobile chassis and to some extent the mobility of self-propelled vehicles, to furnish ammunition with which a railway company can combat free lance competition with a minimum of investment and cost of operation.

Since there are no rails to complete the electric cir-



LAYOUT OF ROUTE ON WHICH TROLLIBUS OPERATES cuit, two overhead wires are used to form an all-metallic circuit. The wires are strung parallel, 14 in. apart, and doubly insulated with porcelain ring insulators. The two wires are held in position by a spreader. The proper installation of the necessary overhead calls for a new complete line of fittings with the exception of the trolley ears and studs. Several accompanying views, some of which were taken while the bus was on the experimental track in Schenectady, show the hangers used on tangent stretches as well as the pull-offs necessary on curve construction.

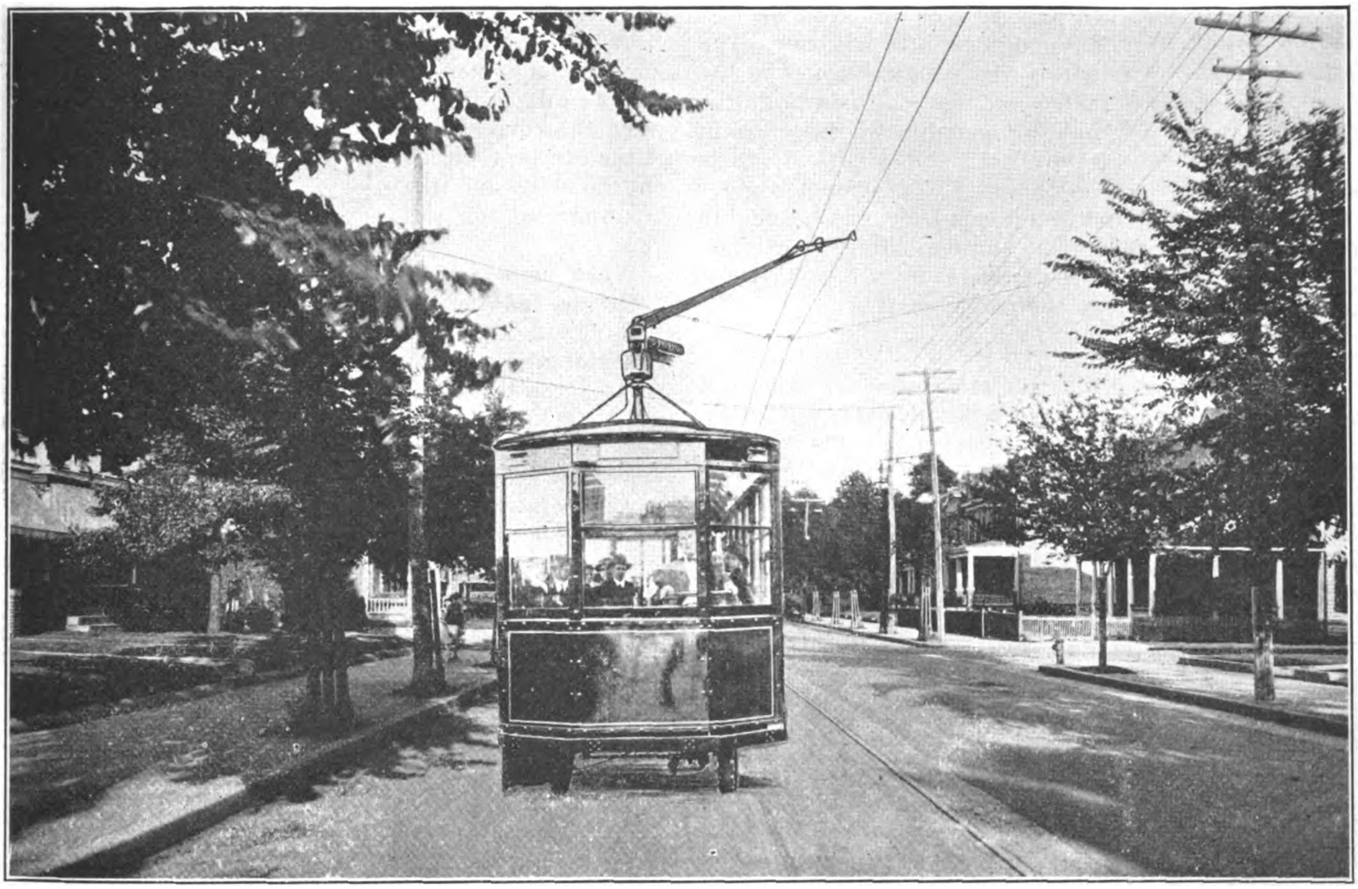
GENERAL DESCRIPTION OF THE CHASSIS AND BODY

The chassis, which has an over-all length of 22 ft. 9 in., can be rated as of 5 tons capacity. The frame is constructed of steel channels, which weigh approximately 13 lb. per ft. and are reinforced with gussets at the corners and at all intersections with cross members. The distance between the side members is 34 in., which provides ample room for hanging the motor in between. To the frame is also directly attached the body, which is constructed of steel uprights on 26½-in. centers and rolled steel car lines that give an arched roof effect very much similar to that of a limousine body. The body is paneled below the window sills with ¼ in. Steelasote and the roof material is Three Star Agasote.

With the body so mounted a semi-flexibility is obtained that is not found in general street car practice, where bodies are built rigidly with side sills and mounted on rigid trucks. The semi-rigid body and frame are supported on half-elliptical springs mounted directly on top of the axles, using the standard Atlas truck method of suspension. The front springs are 50 in. long and 3 in. wide with twelve leaves, while the rear springs are 56 in. in length and have sixteen leaves.

The front axle is an I-beam section and carries 50 per cent of the weight of the bus. The rear end is a standard 5-ton Sheldon worm-gear drive which is connected directly by universal joints to the propeller shaft.

Cushion wheels of the Mead type, built by the American Cushion Wheel Company, are used exclusively. On these wheels are mounted 36 in. x 6 in. Kelly-Springfield solid rubber tires of the caterpillar type. Much has yet to be learned as to the type of tire best suited for trackless trolley operation, and by no means can it be said that any one type is to be used until experiments of sufficient duration have been made in actual service to prove durability and minimum cost per mile. The track tread of the tires as mounted on the wheels is 58 in. measured center to center. This is 2 in. wider than the standard track gage.

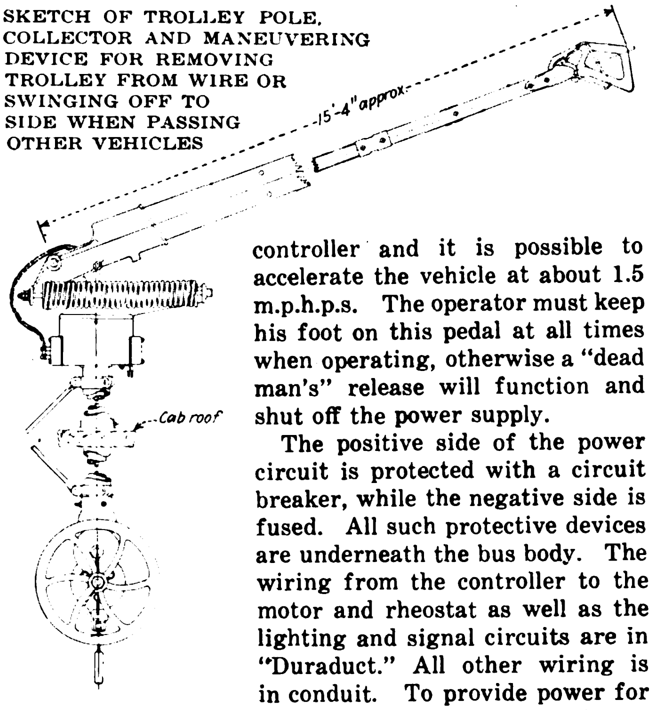


THE EXPERIMENTAL ROUTE IS ALONG FLOYD AVENUE THROUGH THE RESIDENTIAL DISTRICT—THE BUS, WITH ITS LOCAL ENVIRONMENTS, WILL SOON BE A FAMILIAR PICTURE

Power for propulsion is furnished by a standard GE-258 ball-bearing ventilated railway motor, a type that has been largely used for driving safety cars. This motor is so supported between the side frames that it can be direct connected to the propeller shaft by a universal, in about the same manner as an automobile gear drive shaft is connected.

The operator or driver operates the controller by means of a foot-operated RZ type of controller, a detail view of which is presented. By pressing down on the pedal lever, which is mounted in all respects similar to the automobile clutch foot pedal, the driver can actuate the controller point by point by alternately pressing on and releasing pressure on the foot pedal. As the pressure is released, the pedal moves upward and a "dog" catches in the next notch. There are five points on the

SKETCH OF TROLLEY POLE, COLLECTOR AND MANEUVERING DEVICE FOR REMOVING TROLLEY FROM WIRE OR SWINGING OFF TO SIDE WHEN PASSING OTHER VEHICLES



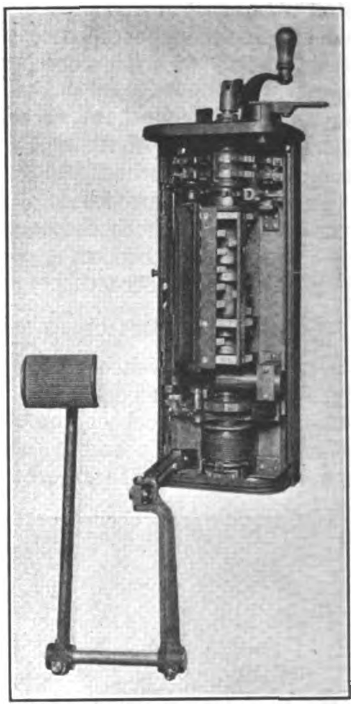
controller and it is possible to accelerate the vehicle at about 1.5 m.p.h.p.s. The operator must keep his foot on this pedal at all times when operating, otherwise a "dead man's" release will function and shut off the power supply.

The positive side of the power circuit is protected with a circuit breaker, while the negative side is fused. All such protective devices are underneath the bus body. The wiring from the controller to the motor and rheostat as well as the lighting and signal circuits are in "Duraduct." All other wiring is in conduit. To provide power for the emergency lighting of the bus body, the headlights and tail-light a 120-amp.-hr. storage battery is carried. This is charged as the bus operates by a 12-volt generator direct connected to the motor shaft.

CURRENT-COLLECTING DEVICE

Power is taken ordinarily from the two overhead wires by a specially designed collector, details of which are shown in one of the accompanying illustrations. This collector, which weighs but 16 lb. exclusive of the base, has two sliding shoes with approximately 12 in. free space for each wire and makes the over-all width of the collector shoe 28 in.

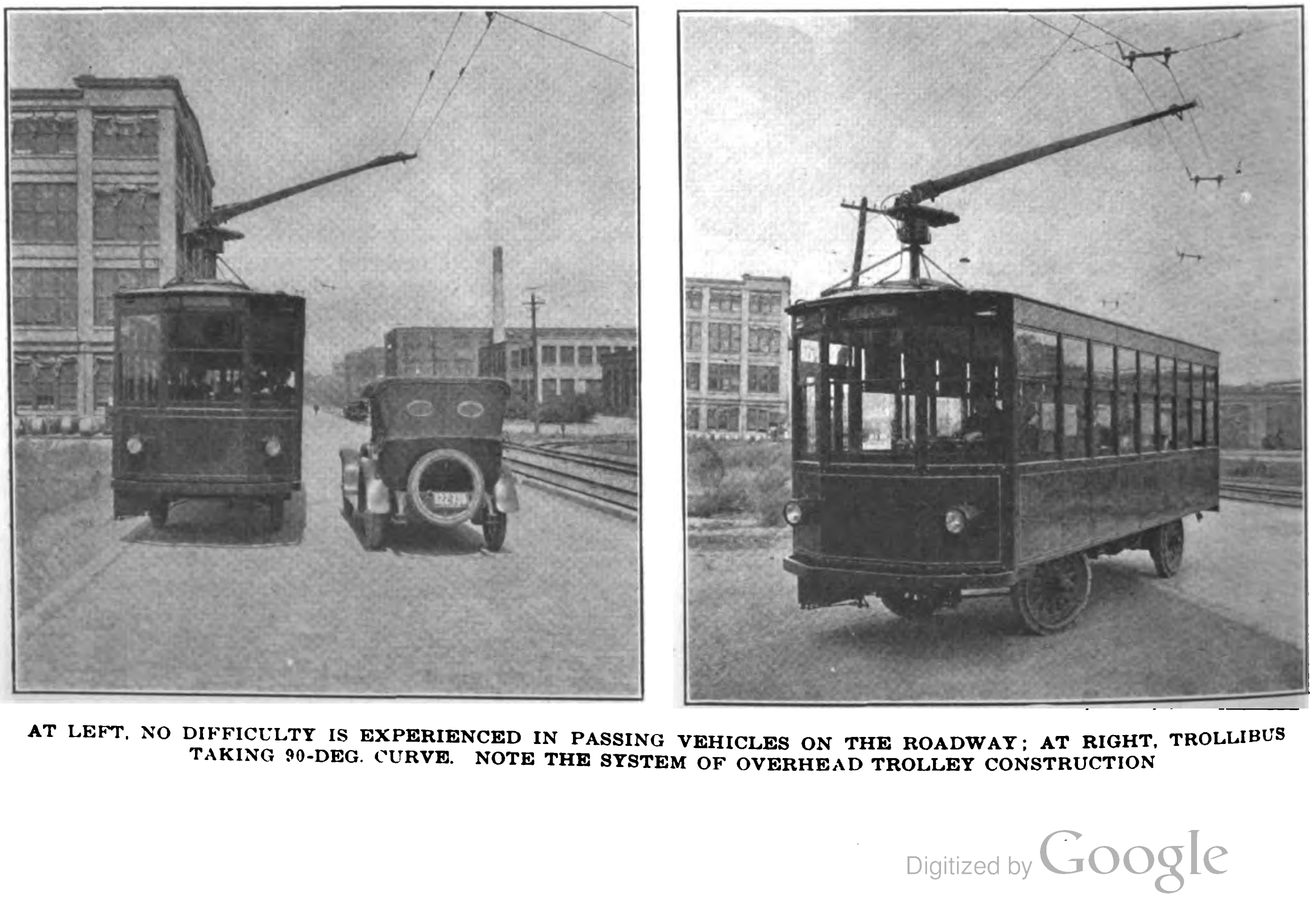
By the use of this form of collector, which has a spring tension of 25 lb., it is possible for the driver to get off center about 9 ft. before the collector will pull off the wires and leave the bus "dead."



INTERIOR VIEW OF CONTROLLER, SHOWING HOW FOOT PEDAL FUNCTIONS WITH RATCHET AT BOTTOM OF CYLINDER SHAFT

The operator can maneuver this collecting mechanism from inside the trolley bus. A vertical wheel which actuates a lever operates against the tension spring and makes it possible when one bus vehicle passes another, utilizing the same trolley wires, to clear the line and allow the one met to proceed. Afterward the current collector can be replaced on the wire and the bus proceed on its run.

When necessary or desirable, as on returning to the carhouse at night or for repairs, the bus can be made to operate on a standard 600-volt trolley circuit. A short-circuiting sliding contact trolley shoe is inserted in the collector, which provides the positive side of the circuit. To get a ground or complete the circuit a metal shoe is fastened to the body frame and dragged along the top of the grounded track rail. By this means it has been found possible to operate the bus at a speed of 8 or 9 m.p.h.



AT LEFT, NO DIFFICULTY IS EXPERIENCED IN PASSING VEHICLES ON THE ROADWAY; AT RIGHT, TROLLIBUS TAKING 90-DEG. CURVE. NOTE THE SYSTEM OF OVERHEAD TROLLEY CONSTRUCTION

The interior finish of the bus, as well as the entrance and location of the apparatus for operation and fare collection, is shown in one of the accompanying illustrations. The seating capacity is thirty and with fifteen standees the maximum safe loading is considered forty-five. On the basis of the seating capacity this allows 5⅓ sq.ft. per seat. At 150 lb. each for the passengers and also including the driver, the live load is 6,900 lb. The over-all length of the vehicle is 24 ft. 8 in., which corresponds to a linear length of 0.822 ft. per passenger seat, as compared to 0.935 ft. with the Birney standard 28-ft. safety car. There are three cross seats and one short longitudinal seat for three passengers on each side of the bus. In the rear is a semi-circular seat large enough to accommodate twelve passengers. The seats are bolted to the body floor and are upholstered in leather and are spaced on centers of 28 in. with an 18-in. aisle. Ventilation is provided by running an air duct on each side above the top of the window sash next to the roof the entire length of the car with an air intake at the front. This duct is perforated with small holes around each of the lamp sockets used to light the body to form an ornamental design. No card advertising racks are carried.

There are two illuminating systems, one on the trolley circuit and the other on the storage battery circuit. The trolley circuits consist of two five-light, 23-watt frosted globes mounted directly over the tops of the windows. The other is an emergency circuit and utilizes current from the 8-volt storage battery. Only three lamps are on the latter circuit, one over the entrance, one over operator's head, the third over rear door.

The entrance and exit are at the front on the right, with doors manually controlled by the operator. The two-leaf folding doors can be opened inwardly so as to give a clear opening of 34 in. At the rear of the bus body is an emergency door.

The steps are entirely within the body, so that with the doors closed there is no opportunity for any one to ride on the outside of the vehicle. The height of the first step from the ground will be from 13 to 15 in., depending on the street level and the number of passengers on the bus. There are two 9-in. risers and a 2½-in. ramp to the level floor, which is about 35 in. from the ground with the bus loaded.

The curtain fixtures are those of the National Lock Washer Company, while the curtain material is pantasote. A Faraday buzzer signal system to the operator is provided for the convenience of the passengers. Two Golden Glow headlights with 21-c.p. lamps are mounted on the front dash and operate from the storage battery.

The side windows can be pushed up 16½ in. so that a passenger has a clear vision. Other accessories include roller destination signs, mirror for operator to maneuver the trolley, Johnson farebox, light switches, etc.

The interior of the car is painted with white enamel above the tops of the windows. The outside is olive green with a gold stripe.

The second Simplon tunnel in Switzerland is reported to be nearing completion. Less than a half mile is still to be completed and about one and a quarter miles of rails to be laid. The electric cable transmission line on the north side has been completed and that on the south side is under construction. It is expected that the tunnel will be ready for traffic in December of this year, by which time the Italian section will also be ready for service.

York's Trolley Bus Service

TROLLEY bus service, according to the *Tramway & Railway World*, was recently established in York, England, over a 1.25-mile route with four vehicles comprising the equipment.

Some of the points that led up to the installation of these buses was that the experience of various authorities with gasoline motor omnibuses upset the optimistic expectations of those who overlooked the disadvantages of the internal combustion engine. It was found that repairs were numerous and costly, that frequent overhauls reduced the annual mileage, so that the useful life of a motor bus was somewhere near five years. Then, finally, just when revenue was being swallowed up by expenses, the price of gasoline increased until the cost of fuel alone reached the abnormal figure of 8 pence (16 cents at normal exchange) per car-mile, and many services that had been launched with the hope of profits were actually operated at a loss.

There are no severe grades on this route in York, but the service is conducted over some of the very narrowest streets in the city, having numerous sharp bends and turns. As a result, the vehicles have the narrow over-all width of 6 ft. 3 in.

As the buses cater to very light traffic, they have been designed on the "one-man" principle, using fare boxes. The driver's vestibule is inclosed and has an entry on the off-side. The cars are of the single-deck type and have a seating capacity of twenty-four.

Motive equipment consists of two 23-B.hp. motors arranged for series-parallel control and two cam-control trolleys. Cars can deviate 17 ft. off center without risk of dewiring.

Another Advantage of Electrification Emphasized

THAT smoke was not only a nuisance but was an actual source of danger was brought out in a paper on the safely hazards of the New York Central Terminal equipment by H. M. Balliet, assistant terminal manager, Grand Central Station, read before the American Society of Safety Engineers on May 27. He showed by means of pictures how dense the smoke in the old Park Avenue tunnel used to be, with the large number of steam locomotives in operation for both through trains and for switching. On certain days, when the air was still and heavy, the tunnel, filled with smoke that refused to dissipate, would be made nearly impassable. At these times the tedious and dangerous practice had to be resorted to of passing an incoming or outgoing train along from flagman to flagman, usually twenty or thirty being required to furnish any degree of safety. The hazard involved in this sort of train operation was great, especially for the yard men and those engaged in the signaling. Train operators who have worked under the new conditions, Mr. Balliet said, realize how many of the former ubiquitous hazards have been corrected by electrification.

In remarking on the hazards of various parts of the electrical installation, Mr. Balliet mentioned how successful from the safety standpoint the type of third-rail construction employed had been. The New York Central third rail is of the under-running type and the cross-section is symmetrical with respect to both horizontal and vertical axes. Because of the wooden sheathing, it is very seldom indeed that any one comes into contact with the rail.

Merchandising Transportation

This Is the Second of a Series by the Author on This Subject—The Topic Particularly Considered in This Issue Is the Education of Trainmen Along Salesmanship Lines and the Illustrations Are from Advertisements Published by the Company or from Bulletins or Letters Sent to Its Men

BY W. H. BOYCE
General Manager Beaver Valley Traction Company, New Brighton Pa.

SOME writer, in defining salesmanship, says: "It is simply making the other fellow feel as you do about what you have to sell." So your job, Mr. Manager, is cut out for you. You must sell the idea of salesmanship to your employees so that they may sell the actual service to your public.

Some trainmen on entering the service do not seem to have been taught the rudiments of courtesy, so you must first teach them to show the proper respect to your passengers, the source of your and their income.

If your employees are courteous and polite, the impression is good. If too short with answers, or other than attentive, the opposite is true. You cannot afford to keep in the service men who would cause the opposite to be true. Indifference to the public on the part of your employees is a very serious blight on your business.

Every employee should be encouraged to acquire a personal reputation for good manners as well as good deportment. They are your personal representatives.

Any conductor who is oversensitive will never be a good salesman. He must be able to take a rebuff without taking offense or without losing his temper.

Interested, careful, safety first, attentive, cleanly, obliging and courteous trainmen will make for more car riders and thus assist you in selling more car rides.

Street railway employees come in closer contact with the public than the employees of other utility companies. Any person accepting employment must obligate himself to do all in his power to prevent disputes. He must be required to be courteous under irritating circumstances and polite under criticism of persons unfit mentally to criticise the service either intelligently or constructively.

On the Beaver Valley Traction lines we have kept before us the idea that the first principle that should contribute to the success of the sales organization is honesty—honesty in dealing with the members of the organization and instilling in them a sense of duty and honesty both to employer and the public.

We have spent considerable time and effort in teaching our employees what we consider proper transportation selling methods and to this end have issued an employees' service code, supplemented by frequent personal interviews and personal letters, and circular or individual letters mailed to employees' homes.

Salesmanship is something more than a science and an art. It is a principle—a principle of human relationship. It is the principle of the influence of one person or persons on another person or persons. To sell we must make the other fellow feel as we do about what we have to sell.

"*WE NEED YOUR HELP*"

If you do not like your job here—*tell us* why.

If you know anything that will improve our service—*tell it to us.*

If you know nothing but scandal about your fellow employees—*keep it to yourself.*

If you know of violations of rules that endanger our passengers or service—*tell it to us.*

If money matters have become a worry to you—*tell it to us.*

If you have money to invest and are offered stock the value of which may be in doubt—*tell it to us.*

If you need legal advice, banking advice, family budget advice, property purchase advice—*tell it to us.*

If there is sickness in your family—*tell it to us.*

It's a Pull Together Idea, Boys
We'll Go the Limit for You

If well, sick, worried or in debt, or you have an idea that will help your company—or anything we can do, get or learn for you the door is wide open—walk in and TELL US.

That'll Help You and Your Company

The Beaver Valley Traction Company.
Pittsburgh & Beaver Street Railway Co.
W. H. BOYCE, General Manager.
H. O. ALLISON, Safety Engineer.

October 13, 1919.

Mr. P. F. Householder, Vanport, Pa.

My dear Householder:

It's costing us about $6.25 to talk to you in this manner. I am doing it, though, expecting that the ultimate result will justify the expenditure. I am sending it to your home, where you will have the leisure to give it the consideration it deserves.

It is a present day issue that the careless and incompetent men cannot long retain a position with a worth-while concern and I want every man on these lines to be a careful Safety First man.

Now, this is an all-together movement. I will do my best to help you understand and act in the manner to prevent accidents and accident chances. I will bear with, advise with, and support you in learning, and hope for efficiency on your part as a reward. I will just as earnestly make an effort to weed out the hopelessly incompetent, for they are a detriment to all of us employees and to the company. I want you to note inclosures herein. I want you to understand these letters and my motive as both are to your interest, and in understanding and acting reap the benefit.

No, "Allison does not report you." He is permitted to tell you the better way. Your record speaks for itself, and bear in mind that when "Allison says this or that," as you may hear from some who have been cautioned, it is a very good idea for you to adopt his suggestion. It may save you an accident. If you can make a suggestion to me that will prevent an accident you can bet your best lantern and last week's pay that it will be adopted. Watch for these letters, discuss them with the wife, if you have one. Discuss them among your fellow employees, or me if you desire, but let them soak in and get under your hide for they mean what they say.

Very truly yours, SAFETY ENGINEER.

Approved: Superintendent.

Typical Bulletin and Letter Issued by Company to Employees

Our ideas of how to sell the service idea to employees is best illustrated by the accompanying examples of talks to the men and the public.

The things kept in mind have been:

1. To make our employees realize the different kinds of competition that we face.
2. To have them make the passengers' ride as pleasant as possible.
3. To have each employee acquire a reputation for good manners.
4. To aid the employee to enjoy his work.
5. To teach each employee to control his temper.
6. To help him to obliterate his self-consciousness and devote all his energies to his duties.
7. To obtain his co-operation.
8. To help him constantly to improve himself.
9. To have him be civil, kindly and thoughtful in his actions, considerate of the welfare and wishes of others; in other words, to be courteous.

In order to live you must sell car rides. Your auditing or stores department may be weeks behind. Your purchasing department may secure inferior materials. Your finances may have been mishandled. And yet for a time you would be able to run cars and sell rides. But to shut off all car riders, all revenue, how long will you be able to operate?

Think it over.

Be a motor car, not a trailer.

Typical Advertisements in Daily Papers

Many Thanks

WE have received letters praising trainmen for courtesy and consideration of passengers' comfort, convenience and welfare. Many cases of kindness to children and elderly people have been mentioned.

Such letters help the public, the employees and the company.

We invite the public to write us about any feature of the work of our trainmen or of our service which they consider worthy of mention. We will see that every such letter is placed before the employee to whom the credit is due and that it is entered upon his record in the company's offices.

We invite you also to report any lack of courtesy or inefficiency. We investigate every complaint promptly and carefully, and take such action as the facts warrant.

Beaver Valley Traction Co.

All Cars Have Controllers.

All tempers should have. If either are missing from our cars or employees won't you give us the benefit of your knowledge? We in turn promise to improve the condition.

Beaver Valley Traction Co.

Your Point of View

OUR car riders here can be assured that this organization will consider each ride sold as much from the rider's viewpoint as from our own.

The cordial relations existing between this company and its thousands of patrons have been strengthened by always trying to put ourselves in the car rider's place.

Do not hesitate to write or phone us upon service matters. We are in your employ.

Beaver Valley
Traction Company

Street Car Conductors—Service and You:—

HUMAN, real, a living, breathing representation of the handiwork of God—that is the Street Car Conductor. He has his temperament, emotions, temptations, likes and dislikes, affections, loved ones, hopes, aspirations, trials and tribulations just the same as you and I.

We take the best of those applying for this position and through teaching and constant supervision strive to make of them such men as will truly represent these companies before you—the public, our patrons.

Just as all humanity is liable to err, misjudge, fail or weaken, this man of service on the cars is not immune. He cannot be and be human. We pride ourselves though that the street car conductor errs less often under a ten times greater strain than those in other similar callings.

Bear in mind the street car conductor daily has a constantly changing patronage. It becomes a finished salesman's task to meet the moods, supply the information, sell the ride, make the collection and satisfactorily close the transaction by delivering each patron safely to destination on time and without undue inconvenience.

We spend much time training the men serving you on the lines. To always keep employed and to employ those who are or will become most proficient is a task. That perfect type of supervision does not, nor will it ever, exist in this or any other calling.

We ask you to expect a better service, more thoughtful attention on these lines than you will obtain in any other community, but, please, when one employee fails to meet your standard or expectation of service, do not condemn us all. Recognize the frailties of man and be governed accordingly.

Beaver Valley Traction Co.
Pittsburgh & Beaver Street Railway Co.

Extracts from Employees' Service Code

INCREASING BUSINESS

Increasing business on the street cars may sound funny to you but it can be done.

Every time you run past an intended passenger you create a feeling that results in his walking.

Every time you are late people walk.

Every time you miss being at the depot stop when the train comes in people walk.

Every fare counts against you, as the fares pay your wages, and I get mine from the same source.

PASSENGER PAYS YOU

The greatest *service* existing in your work is the *service* the passenger gives you. Funny, isn't it? True enough. I said he paid your wages. That's mighty important to you—mine are to me anyway. So, every *service* you can give the passenger will not be any more than he is entitled to—remember that.

But few of the passengers consider you except in the way you serve them in their transportation needs. Do your duty by every one and when the day comes to a close you can in content spend the evening with the folks at home. Violate the rules and circulate your grouch and things won't be pleasant here nor at home.

SOME WALK—SOME RIDE

There is no "have to" about it any more. Those who can, walk when you are not there. Many others buy Fords or automobiles, and if luck is with them "get there" without using the street cars at all.

So you see that we have Competition.

Good business demands that we meet that Competition with something better. There's where your job begins.

HOW YOU MEASURE UP

Let me tell you that the passengers are more valuable to us than you are. We cannot get along without the passengers.

So, put in the background or shelve any idea you may have or had that you are the king pin. You are not—neither am I—the passenger is the important party.

Don't forget it.

THE PASSENGER

What if some of them are cranky and want to "bawl you out" for a mistake of yours that you did not intend to make but did it and it brought forth the passenger's rebuke? Wait until he is through and then in a quiet and gentle tone of voice say "I am sorry, sir, I did not intentionally make the mistake." That is all you need to say. Say it like a gentleman or like the gentleman you are and let the passenger think it over. Not another word from you. This method will win occurrences that if handled differently result in wordy battles; make you feel miserable the rest of the day, hate your job; and make the passenger condemn our service to his friends.

STYLES AND TYPES

All kinds and types of people patronize your car. Complete *service* demands that you please all of them. This includes the man who has just come from a quarrel with his wife and who would like nothing better than to take his revenge out on you. Or, it may be the lady passenger who has just missed a bargain sale because the car she came on was not on time. It may be a bumped corn, dyspepsia, indigestion, stomach ache, or just natural cussedness or disagreeableness. It does not make any difference to you what the cause is. A street car is a public place, and it may be best to let the passenger decide on the attention he or she wishes to attract by language or act. As for you—well, if *our* trainmen could not intelligently meet every such situation we should feel that something was seriously wrong. Keep *Service* in mind. Never sacrifice that to anger or act of yours.

DISCIPLINE

Sometimes it becomes necessary to use harsh measures to enforce full observance of the rules. The trainman who wilfully violates rules will find it a hard matter to hold a position here. Suspension as discipline does not always signify that the lay-off is the end of the matter. It is not the desire of these companies to discharge competent men but the safety of our passengers and complete service to them justifies a careful weeding out of the careless and incompetent.

DON'T SAY DON'T

Never say "Don't" to a passenger of yours. Children are made incorrigible through constant "don'ts" of loving but unthoughtful parents.

Don't is argumentative and tends to arouse a desire to do just what is forbid. Never say to a lady, "Don't get off the car backward." For right away she will think I'll get off the car that way if I want to and it is none of your business. You will get better results if you say *"Please get off the car facing the front."* Too, "move forward" does not mean anything to the people standing in the aisle right at the entrance door. They are on the car and don't realize there is anyone else to get on. It is better to say, *"Please step forward in the car so that others may get aboard."*

Ways in Which Morale Is Increased on the Beaver Valley Lines

Akron's Buses Were Powerful Influences in Developing Housing Sites

No. 1—Present-day standard White truck mounting Avery body.

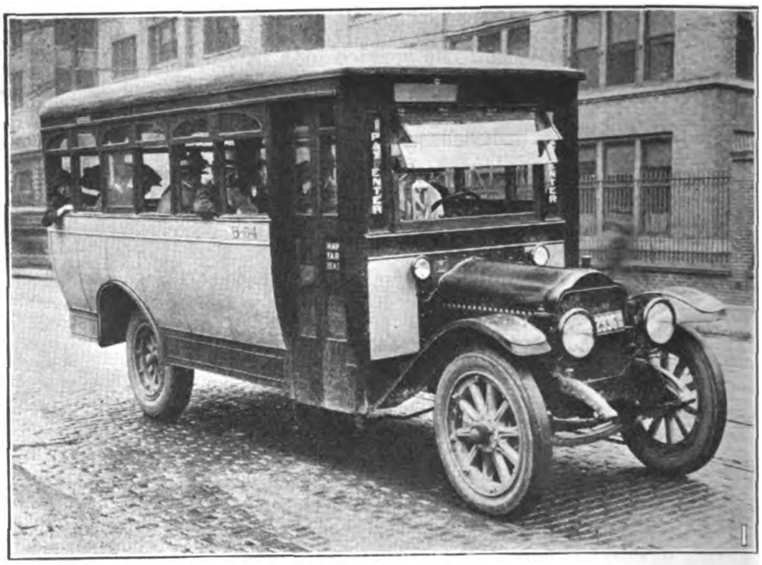
No. 2—Type of original bus put in service in September, 1915.

No. 3—Entrance to Avery type body showing fare box and location.

No. 4—Experimental six-wheel type vehicle, with 70-hp., 6-cylinder, 4¾ x 5½ Wisconsin motor. This vehicle seats forty-four passengers.

No. 5—Interior of Avery body fitted with cross seats.

No. 6—First type of single-deck bus with open body.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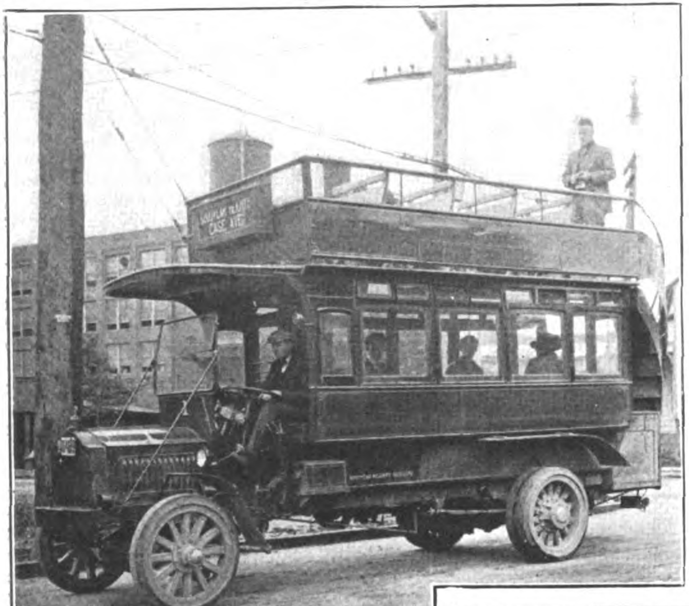

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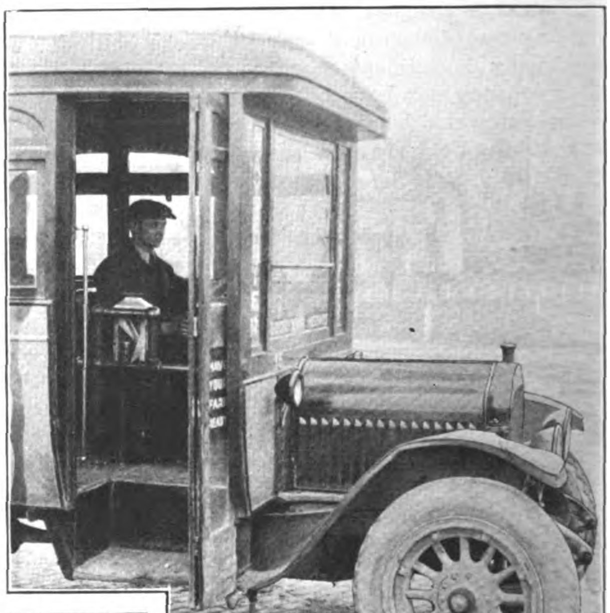
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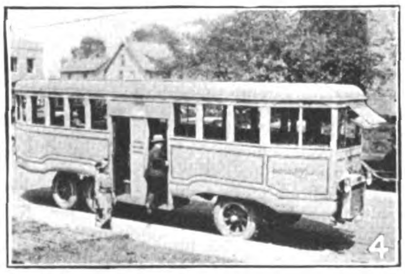
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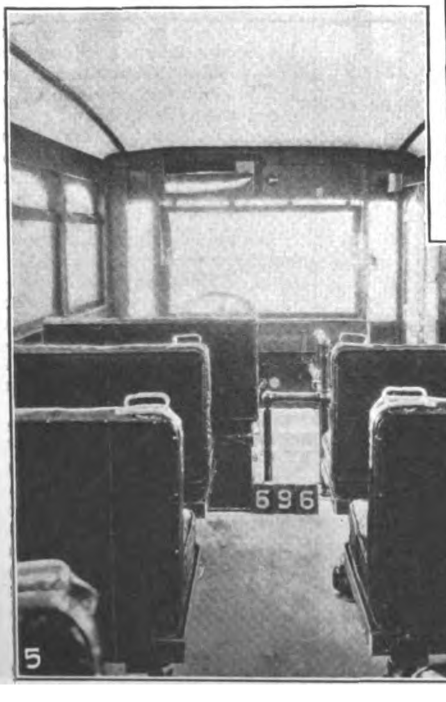

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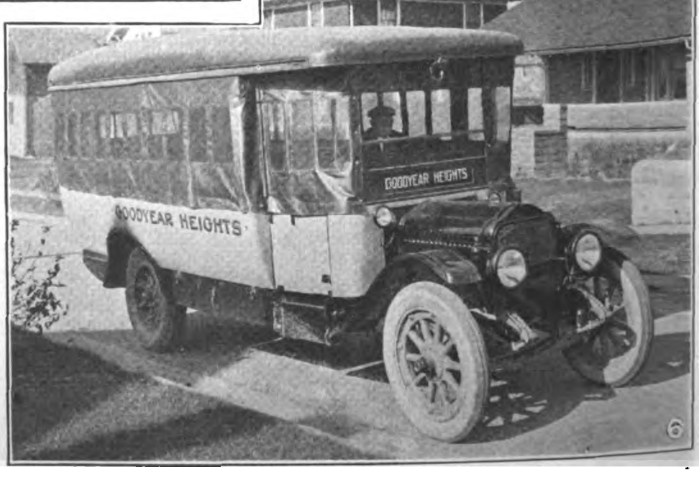

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Akron's Motor Bus Route

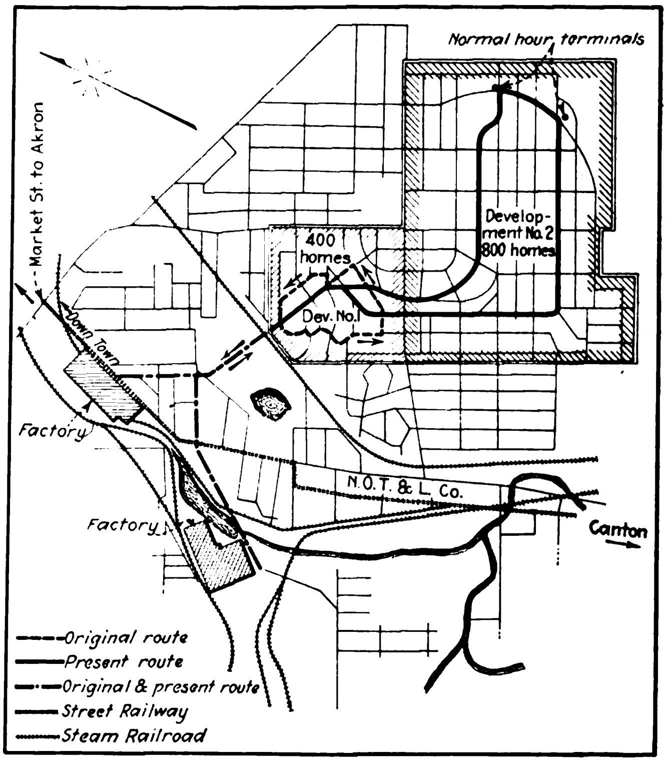
A Non-Competitive Route, Operated in Connection with a Housing Development, Proves that the Motor Bus Can Be Operated Successfully as an Auxiliary When Proper Service Is Given and Reasonable Fares Are Charged —Full Statistics Are Given

THERE is in Akron, Ohio, a bus transportation system that has been in operation several years. This bus line, although operated independently, is an auxiliary to the local street railway system and serves territory not reached by any other transportation service. The line, which in no sense is a competitor of the trolley system, was started by the Goodyear Tire & Rubber Company and is still owned by that corporation, and its purpose is to provide transportation for employees of the Goodyear company between the factory and a tract 2½ miles from the business center of Akron. This property, called Goodyear Heights, had been developed as a residential district in 1913 by the company because of the increasing difficulty which its employees found in obtaining attractive housing facilities in Akron. The first motor bus service was established in September, 1915, because of the need for transportation facilities. It has been the company's policy to make the bus line self-supporting and have sufficient net income after paying operating expenses to meet fixed charges and taxes, including the usual rate of interest on the investment required.

RATES OF FARE

The 3-cent cash fare established when the line was first opened in September, 1915, remained in effect up to December, 1917, when it was changed to 5 cents cash or eight tickets for a quarter. This ticket rate remained in effect until Sept. 1, 1919, when the ticket rate was increased to six tickets for 25 cents, or twenty-eight tickets for a dollar. On Feb. 1, 1920, the sale of twenty-eight tickets for a dollar was discontinued, and on Oct. 1, 1920, the ticket rate of six for a quarter was also discontinued. Since that time the fares have been 5 cents cash without any reduced-rate tickets.

When the bus route opened in September, 1915, the equipment consisted of but one 3-ton capacity truck, on which was mounted a double-deck body, seating thirty-five people, seventeen on the upper deck and eighteen on the lower deck. The upper deck had cross seats while the lower deck had longitudinal seats. The truck was equipped with solid tires throughout, the rear wheels having double treads. An engine capable of handling 5-ton loads was used, due to the severe grades on the route.



ROUTE OF MOTOR BUS AND CONNECTION WITH LOCAL TRACTION COMPANY AT EAST MARKET STREET

TABLE I—OPERATING STATISTICS GOODYEAR HEIGHTS MOTOR BUS LINE

Dec. 1. 1917, to Dec. 31, 1920

	13 Months Dec. 1, 1917, to Dec. 31, 1918	Calendar Year, 1919	Calendar Year, 1920
Buses in operation at start of period	1	2	8
Buses in operation at the close of period	2	8	12
Average number operated per month	1.1	4.8	11.6
Total miles of bus travel	58,451	198,113	332,787
Total miles of bus travel on routes	57,938	194,151	326,622
Slack travel, to and from garage	513	3,962	6,165
Number of one-way trips	44,567	111,581	187,714
Average one-way trip distance (miles)	1.3	1.74	1.74
Time of one-way trips (minutes)	10.0	11.6	11.6
Number of bus-hours of service	7,428	21,572	36,291
Number of bus-hours available	8,113	33,060	79,344
Per cent of time buses in service	91.5	65.0	46.0
Bus-miles per hour of actual bus service	7.8	9.0	9.0
Total passengers carried	520,879	1,745,189	2,490,856
Number of passengers carried per month	40,068	145,432	207,571
Number of passengers carried per day	1,315	4,848	6,919
Number of passengers carried per bus-hour	69.0	80.9	68.6
Number of passengers carried per trip	11.90	15.60	13.30
Per cent passenger loading (21 seats)	55.7	74.3	3.3
Per cent maximum loading (35 passengers)	34.0	45.0	38.0
Number of passengers carried per bus-mile	8.91	8.80	7.48
Miles operated per gallon of gasoline	5.8	5.3	5.3
Miles operated per gallon of oil	56.7	69.2	102.2

In the spring of 1916 the double-deck bus was supplanted by one of the single-deck type, equipped with pneumatic tires. Among the advantages gained from the use of pneumatic tires was much better riding qualities.

The equipment since made standard consists of a 2-ton chassis equipped with a 5-ton motor, on which is mounted an inclosed body of the Avery type with longitudinal seats, and pneumatic tires 40 in. x 8 in. in the rear and 37 in. x 5 in. in the front.

It was found that the 2-ton chassis was adequate to carry the load and would stand the strain, but that a 5-ton motor was necessary due to the heavy grades over which the bus had to operate. This large size motor also has an advantage in obtaining more rapid acceleration after each stop and the buses are capable of making a speed of 30 to 35 m.p.h. where traffic conditions permit. Typical views of the present types of buses are shown in the accompanying illustrations. On Jan. 1 they comprised twelve of various types. There were three of the type B-64 with cross seats and three with longitudinal seats, and four of the type with the side and cross seats. Another type, of which there is but one as yet, is the latest development in passenger carrying buses. It is a six-wheeled chassis, seating forty-four passengers. All wheels are equipped with 40 x 8 pneumatic tires, the four rear wheels being driving, thus increasing traction. The two rear wheels pivot about a trunnion, and thus in going over rough section of road the chassis deflects only one-half as much as a four-wheeled truck. This fact, combined with the use of pneumatic tires, makes the six-wheeled bus an exceptionally easy riding vehicle. This bus was first put into operation in October, 1920, and has been found to be thoroughly practical.

SCHEDULES AND HEADWAY

When the bus route was first opened up the schedule provided a continuous circuit as shown on the map from East Market Street around Development 1. Such routing had its advantages when the traffic was comparatively light, but as the traffic increased this method of routing became less and less desirable because of delays due to interchange of traffic along the road. Numerous schemes of routing were tried in order to determine the best method. When the bus routes were extended to take in Development 2, two distinct routes were operated during the rush hours and buses returned over the same routes. During the normal hours of the day when the traffic was light the buses make a circuit as shown in the map through the second development. The same headway is maintained as during the rush hours, but with only half the number of buses in operation. This feature brings out distinctly the economies that can be directly attributed to the flexibility of a motor bus line.

SCHEDULES MAINTAINED

Date From	 To	Headway in Minutes During Normal Hours	 Rush Hours
September, 1915	November, 1918	20	20
November, 1918	January, 1919	20	10
January, 1919	June, 1919	15	8
June, 1919	August, 1919	10	5
August, 1919	January, 1920	10	4
January, 1920	June, 1920	10-12	3
June, 1920	December, 1920	10-12	3½

ANALYSIS OF OPERATION

Table I shows operating statistics for the period December, 1917, to December, 1920, inclusive. These figures are actual and show all important data relative to operation. It will be noted that the percentage of available time that the bus equipment operated in 1918 was 91.5 per cent as compared with 65 per cent in 1919 and but 46 per cent in 1920. This figure is specific in that the net earnings of the property are almost directly proportional to this load factor. It shows that care should be exercised in making additions to equipment, where added use of existing equipment might be made to serve the requirements.

Table II shows financial operations for the same period. Tire costs have been included at customers' list prices on the following mileage basis: In 1918—9,000 miles; in 1919—10,000 miles; in 1920—11,000 miles.

It will be noted that the revenue as shown is a straight 5-cent cash fare, even though the actual fare collection was somewhat less, and in accordance with the rate schedule shown in the previous paragraph. As this bus line was not operated for profit it is believed that the revenue as shown from a 5-cent cash fare will be of more interest than the actual revenue received.

The study of Table II shows that the lowering of the load factor on the bus decreases the bus mileage per bus and increases the cost per mile of operator's labor. The amount of depreciation is based on a bus life of 100.000 miles, which mileage is covered in three and one-half to four years. The buses at the end of this period of time are carried at a minimum service value of $1,000, the depreciation being adjusted according to the selling price when the bus is sold.

TABLE II—INVESTMENT, OPERATING EXPENSE AND REVENUE GOODYEAR HEIGHTS MOTOR BUS LINE

	Actual Thirteen Months Ended Dec. 31, 1918	 Year Ended Dec. 31, 1919	 Year Ended Dec. 31, 1920	Per Bus Mile Thirteen Months Ended Dec. 31, 1918 Cents	 Year Ended Dec. 31, 1919 Cents	 Year Ended Dec. 31, 1920 Cents	Percentages of Total Operating and Fixed Charges Thirteen Months Ended Dec. 31, 1918	 Year Ended Dec. 31, 1919	 Year Ended Dec. 31, 1920
Investment:									
At beginning of period	$6.075	$8.336	$29.370	......	......	......	......	......	......
Added during year	6.425	30.770	47.568	......	......	......	......	......	......
Total at end of year	$12.500	$39.106	$76.938	......	......	......	......	......	......
Buses sold during year	....	....	8.572	......	......	......	......	......	......
Depreciation charged to operation	4.164	9.736	18.721	......	......	......	......	......	......
Depreciated investment n buses at end of year	$8.336	$29.370	$49.645	......	......	......	......	......	......
Operating expenses:									
Gasoline	$2.570	$9.745	$16.199	4.39	4.92	4.87	13.10	13.79	13.12
Lubricating oils	562	3.036	3.080	0.96	1.53	0.93	2.85	4.28	2.52
Tires—customer's list prices	3.168	12.820	16.972	5.42	6.47	5.10	16.20	18.08	13.75
Operator's wages	4.203	15.559	33.973	7.19	7.85	10.21	21.50	22.00	27.48
Operation—sub-total	$10.503	$41.160	$70.224	17.96	20.77	21.11	53.65	58.15	56.87
Maintenance—labor and material	$2.402	$10.230	$14.454	4.11	5.17	4.34	12.27	14.47	11.70
Sundry expense, supervision, minor adjustments, washing and cleaning, non-productive stores' expense and administrative overhead	1.222	5.227	9.386	2.09	2.64	2.82	6.25	7.39	7.59
Miscellaneous expense	195	292	788	0.33	0.14	0.24	0.98	0.39	0.65
Maintenance—sub-total	$3.819	$15.749	$24.628	6.53	7.95	7.40	19.50	22.25	19.94
Insurance (public and passenger liability)	$438	$1.813	$4.363	0.75	0.91	1.31	2.24	2.54	3.52
Garage rental—$10 per bus per month	140	580	1.394	0.24	0.29	0.42	0.71	0.81	1.13
Depreciation	4.164	9.736	18.721	7.13	4.92	5.62	21.30	13.79	15.15
Sub-total	$4.742	$12.129	$24.478	8.12	6.12	7.35	24.25	17.14	19.80
Total operating expenses	$19.064	$69.038	$119.330	32.61	34.84	35.86	97.40	97.54	96.61
License tags and 6 per cent interest on investment	506	1.735	$4.193	0.87	0.87	1.26	2.60	2.46	3.39
Total—operation and fixed charges	$19.570	$70.773	$123.523	33.48	35.71	37.12	100.00	100.00	100.00
Operating revenue based on 5 cents cash fare	26.044	87.259	124.543	44.56	44.04	37.42	133.00	123.10	100.80
Net income on above basis	$6.474	$16.486	$1.020	11.08	8.33	0.30	33.00	23.10	0.8
Net income per passenger carried, cents	1.24	0.94	0.04	......	......	......	.....	......	......
Cost per passenger carried, cents	3.76	4.06	4.76	......	......	......	......	......	......
Net income in per cent per year of average investment	51.8	42.2	1.49	......	......	......	.....	......	......

It will be noted that the insurance item covers both passenger and public liability. As this item has rapidly become a burden it is questionable whether or not it is advisable to carry such insurance or assume the risk for the operators' account, as is done by other public service corporations.

More Open Cars Converted for One-Man Operation

Large Double-Truck One-Man Cars with Removable Sash Are Made from Fourteen-Bench Open Cars by the Eastern Massachusetts Street Railway

THE Eastern Massachusetts Street Railway has recently completed the reconstruction of thirty-seven former fourteen-bench double-truck open cars for use as one-man cars.

The accompanying illustrations show the original old-style open car body and its transition into a closed one-man car. An interesting comparison is furnished in one photograph between this reconstructed car and one of the standard Birney types of safety car. The car as reconstructed measures 41 ft. over all.

The first step in reconstruction was the removal of practically all equipment, including controllers, air brakes, electrical equipment, seats, running boards and old lighting fixtures. At the right-hand corners the longitudinal body sills were cut away to provide for the new door openings and the vestibule was reinforced with steel castings. The body posts on each side of the car were cut so as to allow the installation of two 2-in. x 8-in. longitudinal trussplanks on each side of the car.

Instead of the usual folding step, these cars were rebuilt with a pair of stationary steps of good width. This was accomplished by cutting quite deeply into the vestibule. Sets of folding doors were provided which are operated by pneumatic door engines, the width of the door opening being 42 in.

These reconstructed cars have a seating capacity of forty-four, with nine cross seats on each side of the center aisle and two 36-in. longitudinal seats at each end of the car. New cross-seat mechanisms were purchased and wooden seats and seat backs were manufactured in the company's shop, utilizing the old open-car seats. These cross seats are 31 in. in width and spaced 30 in. back to back. The width of the center aisle is 24 in. Grab handles are provided.

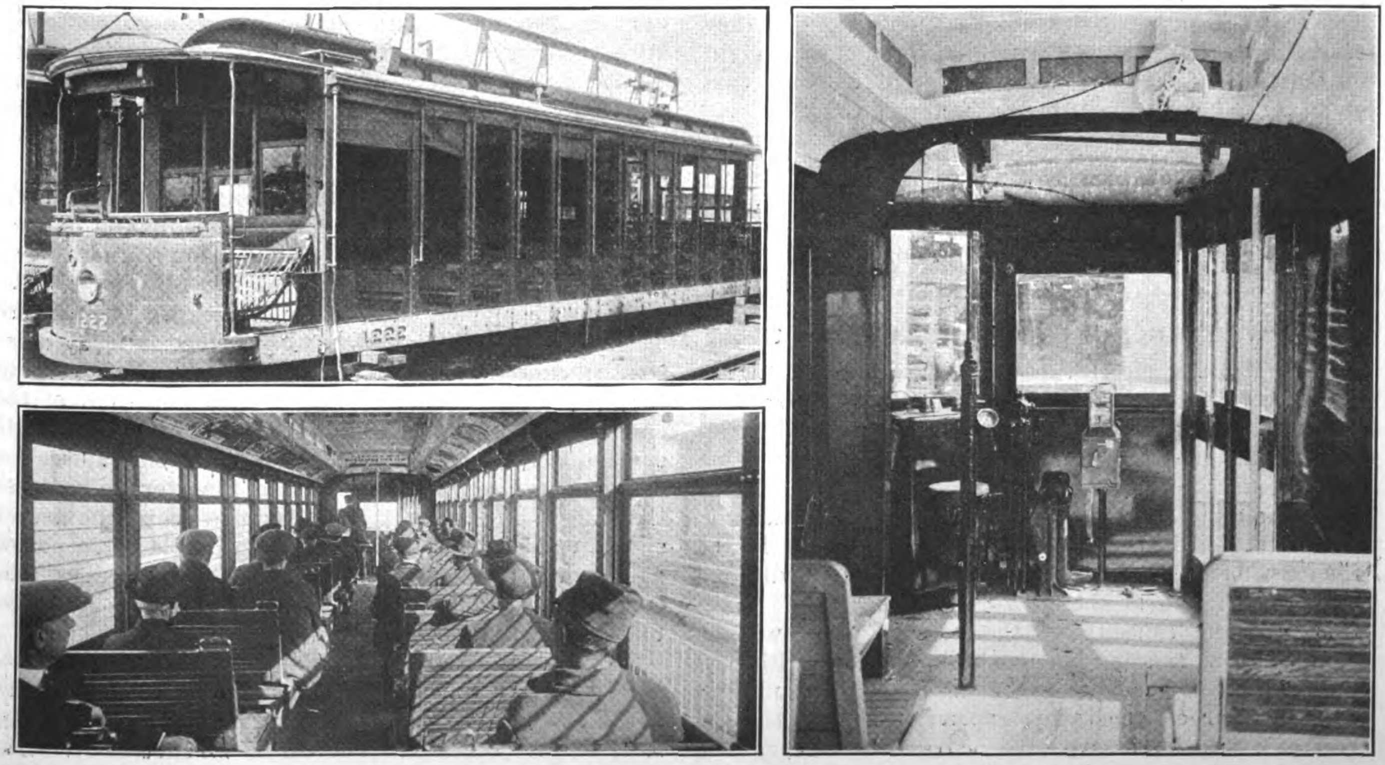
These cars are equipped with sixteen Consolidated cross-seat type heaters which were transferred from obsolete passenger cars. Interior illumination is provided by means of eighteen 23-watt incandescent lamps arranged in two rows along the clearstory.

One of the features of the reconstructed car is the use of portable steel sash, which may be completely removed during the summer if desired. This allows the car to do service practically as an open car. In years past, when this company regularly operated open cars on its lines in summer, it enjoyed quite a fair amount of purely pleasure-riding traffic, as it reaches many popular beaches, lakes and parks and operates through stretches of beautiful country. It is hoped that by making the new cars comfortable and giving them some of the advantages of open cars some extra summer traffic may be developed.

The signal system consists of twenty-four push buttons installed on the body posts between the windows. The Faraday electric line voltage buzzer system is used.

The original air-brake equipment and most of the original electric equipment of the cars were utilized, being replaced after a thorough overhauling.

The arrangement of the operating equipment, including the Johnson fare box, is shown by the accompanying photograph. The fare box is placed close to the dash and almost in the center, where it is most easily reached and watched by the operator but is well out of the way of passengers leaving the car. It is expected that incoming and outgoing passengers will naturally keep to the right.

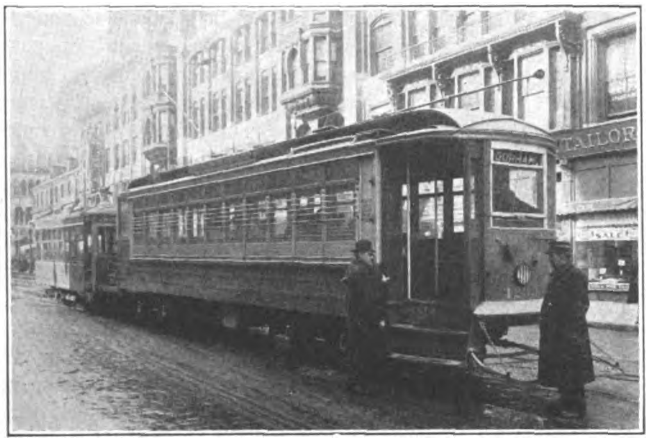


AT TOP, LEFT, OPEN CAR BODY BEFORE RECONSTRUCTION. AT BOTTOM, LEFT, INTERIOR VIEW OF CONVERTED CAR. AT RIGHT, OPERATING END OF REMODELED CAR PHOTOGRAPHED DURING RECONSTRUCTION

The requirements of the Massachusetts Department of Public Utilities have been met by the installation of a safety device, accessible to passangers, which permits of any one shutting off the power, applying the air brakes and unlocking the pneumatic doors at both ends by simply pulling a conductor's valve. This device is described in more detail and the order relating to it is given in an article on page 1175 of this issue.

These reconstructed cars weigh approximately 40,000 lb., completely equipped, and the first few cost approximately $3,000 each. It is believed the cost will be materially less when computed on the entire lot. The work of reconstruction was planned and supervised by W. C. Bolt, superintendent of rolling-stock and shops, and was accomplished in part by the Laconia Car Company, Laconia, N. H., and partly in the railway's shops.

The Eastern Massachusetts Street Railway has already converted into one-man cars a large number of its double-truck box cars of the two-man type, has 250 standard one-man cars in service and has now completed the conversion of thirty-seven former open cars. The trustees have clearly indicated to the public they serve, and to the public officials, that the financial plight of the road is such that it is a case of one-man cars or no cars at all. When their program is complete, and they have already reached 90 per cent one-man operation, there will be only about fifteen two-man cars in operation, out of a total of approximately 600 operating cars. They are now operating one line of double-truck one-man cars into the heart of Boston.



REMODELED CAR WITH BIRNEY CAR AT REAR

Havana Increases Power Equipment

IN MAY, 1920, the Havana Electric Railway & Light Company made a contract with the Westinghouse Electric International Company to furnish two 25,000-kw. turbine-generating units with all auxiliaries. One of these machines is to be shipped about Aug. 1, this year, and the other eight months later. The first unit is to be installed in the present power plant alongside of the existing 12,500-kw. units. The second unit will take the place of one of these 12,500-kw. machines. With this plan the capacity of the present plant will be doubled. The existing boilers, when provided with new high-capacity furnaces and economizers, will be sufficient for the enlarged generating capacity. Except for the receipt of the necessary pipe, valves and fittings, the equipment for eight additional boilers and furnaces for burning Mexican crude petroleum is complete. Any improvements that are to be made in the rest of the boiler plant cannot be determined until the oil-burning equipment has been fully tested.

Manufacturer Pays for Trolley Extension

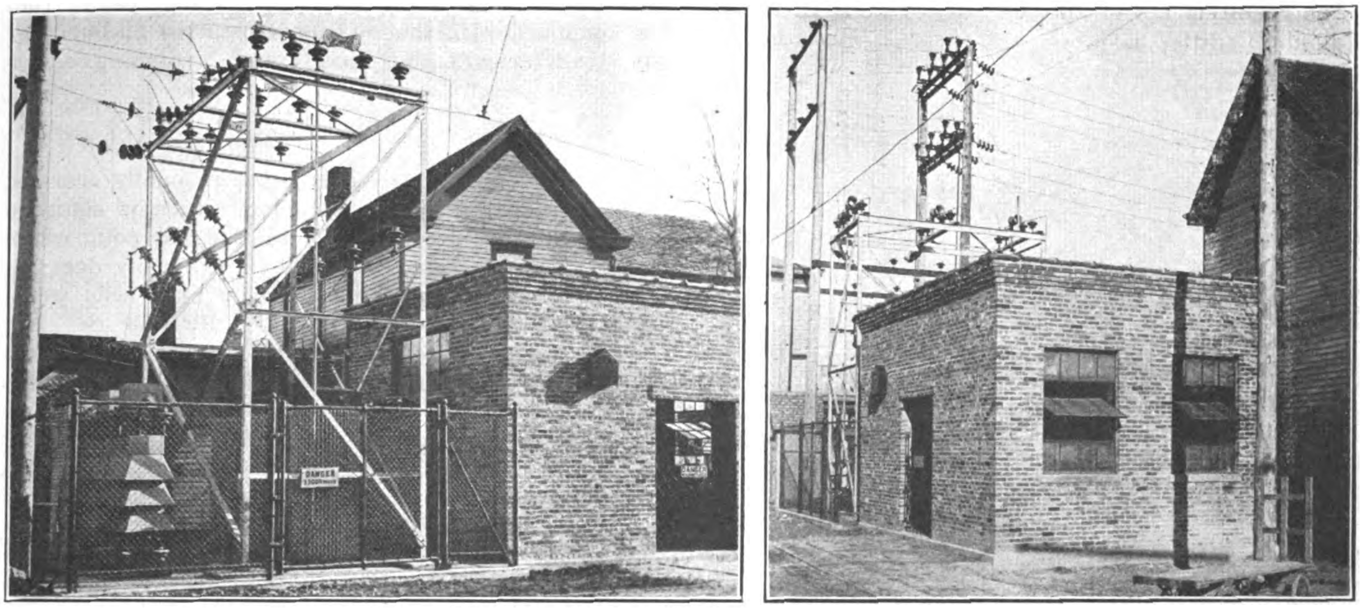
Earnings of Line Are Guaranteed for Five-Year Period—Preferred Stock Given in Exchange for Cost of Construction of the Line

AN UNUSUAL contract for a line extension was entered into in September, 1919, between the Madison (Wis.) Railway and Oscar Mayer & Company, who had built a new packing house a short distance outside of the city. The length of the extension involved was 4,150 ft. and the actual cost of construction was $43,000. Negotiations between the packers and the company resulted in a contract, because of the inability of the company to finance the extension or to see how the line would be self-supporting within five years, and this contract provided that the packer should buy at par preferred stock of an amount equal to the cost of the extension.

The packer deposited in advance in a local bank $30,000, which was drawn upon for the construction work. It was agreed that if the cost of the work exceeded $30,000, the packer was to purchase additional preferred stock to cover that cost. The contract provides that no dividends will be paid for the first five years, but after that they shall become accumulative. The packer guarantees to pay the cost of operation of the extension for the first five years. A minimum service of three hours per day is provided, for which he must pay the company $10 per day. For additional service of the first car in excess of three hours there is a payment of $3 an hour or fraction thereof, with time figured from the time the car leaves the carhouse until it returns. If additional cars are required, a charge of $5 for the first additional car for the first hour, $4 for the second hour and $3 for the third hour, or fraction thereof, is made. For the second and each additional car, a guarantee of $10 per day minimum is made. The hours during which service may be requested are limited to those between 6 a.m. and 9 p.m., with Sundays and holidays excepted altogether.

The packer receives a credit of 5 cents per day per employee in his plant against these guaranteed charges. This credit is given on a monthly basis, but in no case is the credit to be in excess of the amount guaranteed. In other words, in no event does the railway pay the packer any money under this credit provision. The basis of crediting the packer was reached in a way that was intended to eliminate the expense of keeping accounts. The company estimated that one-half of the employees of the packer, on the average, would ride out and back each day. Consequently, 5 cents apiece for all employees per day was taken as the average business that might be expected. If, after five years, the packer should employ less than twenty-five people for a period of one year or more, or go entirely out of business, the company has the right to discontinue service and take up the track.

The extension was built with 73-lb. rail laid on 6-in. x 8-in. x 7-ft. cedar ties on a concrete base and with brick paving. It was made at the end of an existing line, so that service of one car is extended out to the packer's plant in the morning and again in the evening rush hour.



TWO VIEWS OF THE 500-KW. SUBSTATION AT SELLERSBURG, IND., WHICH IS TYPICAL OF THE CONSTRUCTION USED AT ALL RAILWAY SUBSTATIONS

Traction Power Obtained at Lower Cost

Interstate Public Service Company on Indianapolis-Louisville Line, Made Up of Three Once Independent Properties, Inaugurates $40,000 Annual Saving by Rehabilitation of Its Power System—One Automatic Substation Included in Program

THE power supply system of the Interstate Public Service Company of Indianapolis has just been improved.* The work included the shutting down of one direct-current generating station and one 25-cycle generating station, the building of 54.6 miles of new 33,000-volt transmission line and the rebuilding of 58.25 miles of existing transmission lines for higher voltage, the making of arrangements for purchasing power at Louisville and Indianapolis, the junking of the rotary converter and other substation equipment at six substations, the purchase of new converters and switching equipment for ten substations and the erection of six new substation buildings.

Originally, when the line between Indianapolis and Louisville was owned and operated by three different companies, the 58 miles from Indianapolis to Seymour was operated with 600-volt trolley current supplied by a 25-cycle, 370-volt generating station located at Edinburg, Ind., and distributed over a 15,000-volt transmission line extending to Southport on the north and to Reddington on the south and connecting with six rotary-converter substations. The 41-mile section of the line from Seymour to Sellersburg was operated at 1,200 volts trolley potential supplied by a reciprocating engine, direct-current generating plant located at Scottsburg, each engine being direct-connected to two 600-volt generators connected in series. Feeders extended approximately 20 miles each way from this power house. The 14-mile section of the line between Sellersburg and Louisville was operated with a 600-volt trolley current supplied from two converter substations, for which power was purchased from the Louisville Gas & Electric Company and transmitted to it at 4,400 volts. These two substations were operated at 60 cycles frequency and no change in them was required except for the transformers, for which new ones were substituted to receive energy at 13,200 volts instead of 4,400 volts.

LIGHTING AND INDUSTRIAL POWER LOAD INVOLVED

An important consideration involved in the rehabilitation of the power-supply system for the interurban line was the fact that the Interstate Public Service Company also serves the towns of Greenwood, Franklin, Columbus and Seymour with current for lighting and power purposes. This practically necessitated 60-cycle energy, and rather than resort to the use of frequency changers to supply the lighting current for these towns, and because it had been determined that a good economy could be effected through the purchase of power at Indianapolis and Louisville which was of 60-cycle frequency, it was decided to substitute 60-cycle rotary converters for the 25-cycle equipment formerly in use. A 33,000-volt transmission line connecting all of the railway substations and the lighting substation was therefore built and arrangements made with the Merchants' Heat & Light Company at Indianapolis to supply the major portion of the energy required. The existing transmission line, extending from Southport to Reddington, was then reconstructed and spaced for 33,000-volt operation, and extended north about 4 miles to connect with the Merchants' Heat & Light Company transmission system at the city limits of Indianapolis. A new 33,000-volt line was also built from Reddington south to Watson Junction, where it was tied in with the Louisville Gas & Electric Company system by installing 33,000/13,200-volt transformers, the 4,400-volt line from

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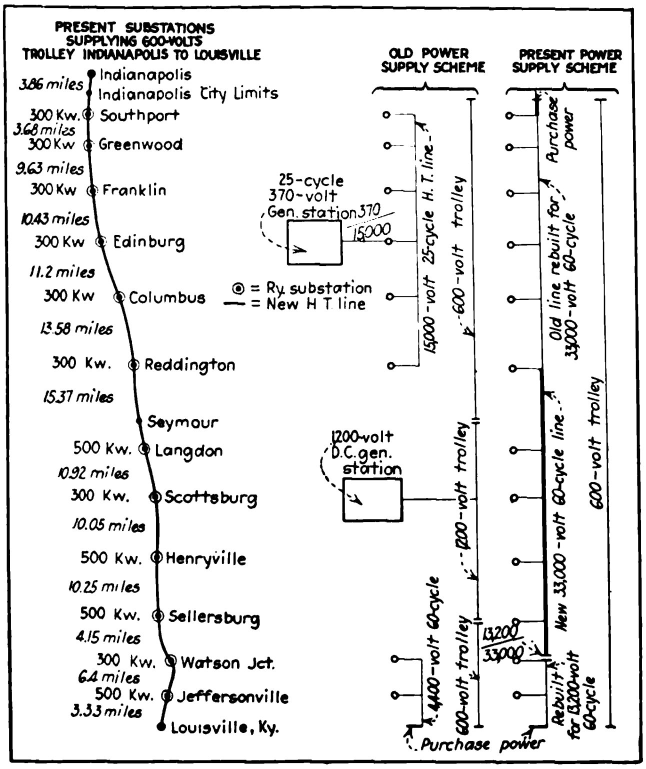
*See articles in issue for June 4, page 1027, for other improvements on this property.


PRESENT SUBSTATIONS SUPPLYING 600-VOLTS TROLLEY INDIANAPOLIS TO LOUISVILLE
Indianapolis
3.86 miles
Indianapolis City Limits
300 Kw. Southport
3.68 miles
300 Kw Greenwood
9.63 miles
300 Kw Franklin
10.43 miles
300 Kw Edinburg
11.2 miles
300 Kw Columbus
13.58 miles
300 Kw. Reddington
15.37 miles
Seymour
500 Kw. Langdon
10.92 miles
300 Kw. Scottsburg
10.05 miles
500 Kw. Henryville
10.25 miles
500 Kw. Sellersburg
4.15 miles
300 Kw. Watson Jct.
6.4 miles
500 Kw. Jeffersonville
3.33 miles
Louisville, Ky.
◉ = Ry. substation
— = New H T line
OLD POWER SUPPLY SCHEME
PRESENT POWER SUPPLY SCHEME
25-cycle 370-volt Gen. station
370/15000
15000-volt 25-cycle H. T. line
600-volt trolley
1200-volt D.C. gen. station
1200-volt trolley
4400-volt 60-cycle
600-volt trolley
Purchase power
Purchase power
Old line rebuilt for 33000-volt 60-cycle
New 33,000-volt 60-cycle line
13200/33000
Rebuilt for 13200-volt 60-cycle
600-volt trolley

DIAGRAMS SHOWING PRESENT LOCATION AND SPACING OF SUBSTATIONS AND LAYOUT OF THE OLD AND THE PRESENT POWER SUPPLY SCHEMES

Louisville to Watson Junction having been changed over for 13,200-volt service.

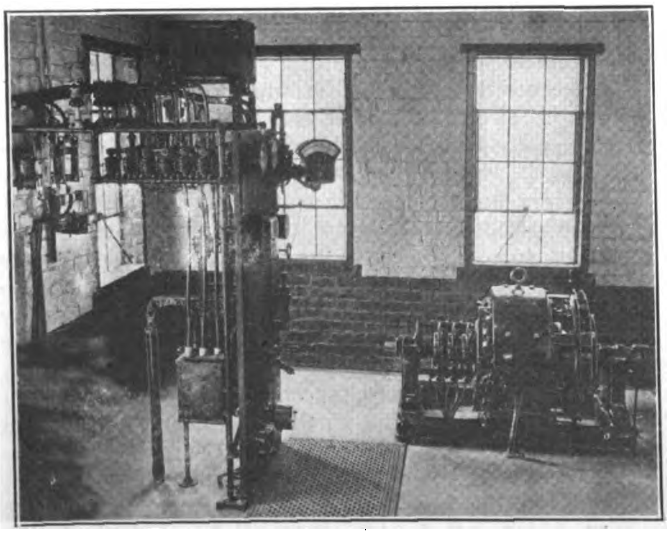
The 25-cycle substation equipments at Southport, Greenwood, Franklin, Edinburg, Columbus and Reddington were replaced with 300-kw., 60-cycle units, and at Edinburg and Columbus the installation included a new substation building. To serve that section of the line formerly operated at 1,200 volts, the old direct-current power house was replaced by four 500-kw., 60-cycle, six-phase, 600-volt substations located at Langdon, Scottsburg, Henryville and Sellersburg. Except at Scottsburg, where the converters and other substation equipment were installed in the shop, new buildings were erected. In all the stations where practical the transformer station for the lighting and power load was combined with the railway substation and outdoor type transformers and high-tension switching equipment were used for both.

AUTOMATIC SUBSTATION LOCATED AT LANGDON

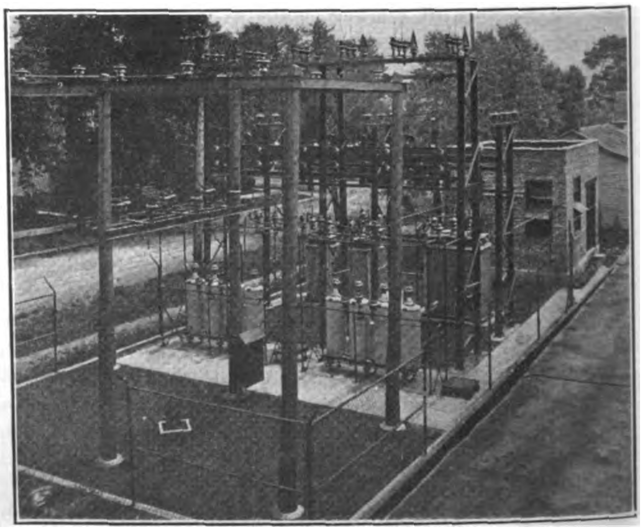
All of the railway substations are manually operated except the one located at Langdon, which is equipped with automatic control. Langdon is the only point where a substation is located at which the company does not have either a station agent or shop man, who would have to be on the payroll anyway. Between Seymour and Sellersburg, where there had been no substations previously, it was possible to locate all of the new substations except Langdon at points where they could be operated by regular employees of the company, so that the saving of labor derived from automatic operation was a factor only at Langdon. It is tentatively planned to install another 500-kw. rotary converter substation at Seymour. Beyond that, future requirements will be secured by installing additional converters in the existing substations, according to present plans.

An accompanying sketch shows the present substation spacing and pictures schematically the old and the new power supply system, from which the changes made can be seen at a glance. Pictures of several of the substations are also reproduced and these are typical of the construction followed throughout the system. The converter is housed in a small square brick building and the transformers and high-tension buses and switches, lightning arresters, etc., are installed outside the building.

A saving in the cost of power of between $12,000 and $15,000 annually was estimated to result from the shutting down of the Scottsburg direct-current power house, and $25,000 additional by closing down the Edinburg alternating-current power house. A total saving of approximately $40,000 a year has thus been made by shutting down the two obsolete power plants and arranging for the purchase of energy. No accurate comparison of the energy consumption per car-mile operated under the improved power and distribution system as against the old system is available owing to the incomplete sets of measuring instruments in use in the old installations.



TYPICAL INSTALLATION OF CONVERTER, SWITCHING APPARATUS, ETC. THIS PARTICULAR PICTURE IS OF THE 300-KW. SUBSTATION AT EDINBURG, IND.



TYPICAL COMBINATION RAILWAY AND LIGHTING SUBSTATION. THIS PICTURE SHOWS THE COLUMBUS SUBSTATION ADJACENT TO CARHOUSE

What Traffic Observations Are Needed

The Information Obtainable from These Observations Is Well Worth the Required Expenditure of Energy —Full Use Must Be Made of All Data Collected

By J. Kappeyne
Railway Engineer, Syracuse

THE necessity of furnishing the best possible service consistent with the lowest possible cost is forcibly being impressed upon nearly every executive in the electric railway field today.

Good railway service requires quick response to the demand for service. Low costs, particularly during periods of high wages, are reflected by high average operating speed.

Schedules indicate the amount and the speed of the service the company purposes to furnish. It becomes, therefore, necessary that the schedules be constantly adjusted with every important fluctuation in the demand for service and that they be frequently revised whenever there exists undue interference with the established speed.

Unfortunately too many schedules are still in effect which were made as applying to conditions which no longer control. Frequently no effective means are taken to keep the traffic department properly informed of important changes affecting the demand for service or the operating speed. Often the old-fashioned method of having inspectors report such changes in conditions as they may have been able to observe gives the only information upon which a revision of schedules is based.

It is essential, in order to keep service and its cost abreast of the times, that systematic traffic observations be made at regular intervals. By properly grouping and analyzing the data collected from a so-called "on and off" traffic survey the following information may be readily obtained:

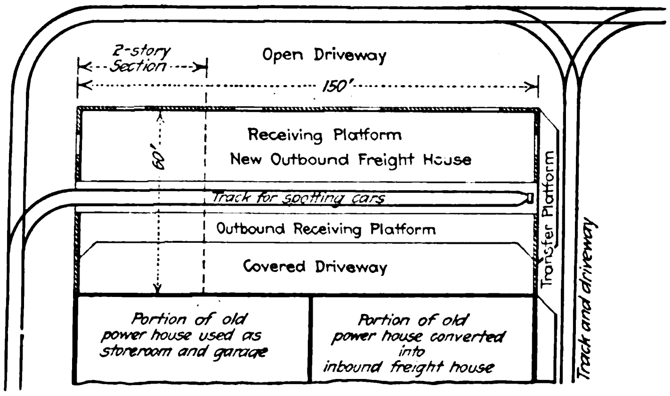
1. The number of passenger-miles, from which may be calculated the average length of ride per passenger.
2. The traffic density, or the average number of passengers per car, which enables the selection of the proper location for collecting multiple fares, and for turning switchback service.
3. The segregation of the profitable from the unprofitable lines, which is determined by the combination of length of passenger haul with traffic density.
4. The passenger traffic flow, which represents demand for service. This, when compared with the number of cars operated, or more correctly the passenger spaces, gives a relative picture of the quality of the service furnished.
5. The maximum load carried, which is the basis for determining the amount of service to be furnished.
6. The diversity factor of demand for service, used in establishing a reasonable standard for service.
7. The length of standing passenger haul, which is a factor to be considered in determining the adequacy of the service furnished.
8. The number and frequency of stops made, generally warranting a revision of car-stop locations.
9. The running time between time points, allowing the checking of schedule time against actual time, and often forcibly demonstrating the necessity of establishing different schedule speeds for various periods of the day.
10. The time when and the location where the lowest car speed is found. This usually indicates maximum interference by other traffic. Where feasible, conditions unduly retarding traffic should be remedied.
11. The greatest number of cars passing a certain point per unit of time, giving an indication as to track capacity and often demonstrating the necessity of rerouting certain cars on parallel streets.
12. The daily passenger load curve, which shows whether the traffic on each end of through lines is properly balanced.
13. The irregularity of headway, obtained by comparing actual headway with scheduled headway. This furnishes a relative measure of the efficiency of the traffic inspectors.
14. The location of points of heavy loading and of frequent interchange of traffic, indicating where inspectors should be stationed in order to give assistance to the greatest number of the riding public.

Railway officials are not always fully alive to all of the information obtainable from such a traffic survey. Frequently a survey is made with one particular object in view and the analysis of the other obtainable results is neglected.

If full use is not made of all the data collected from traffic observations, an opportunity may be lost to improve the service or to reduce the cost thereof.

New Terre Haute, Indianapolis & Eastern Freight House

THE Terre Haute (Ind.) Division of the Terre Haute, Indianapolis & Eastern Traction Company has recently completed a new outbound freight house for the convenience of Terre Haute shippers. The building is constructed of brick and is 150 ft. long by 50 ft. wide, with a two-story section along the front to provide office quarters on the second floor. An idea of the floor plan of the building, track layout to serve it, etc., may be gained from the accompanying sketch.


2-story Section
Open Driveway
150'
60'
Receiving Platform
New Outbound Freight House
Track for spotting cars
Outbound Receiving Platform
Covered Driveway
Transfer Platform
Track and driveway
Portion of old power house used as storeroom and garage
Portion of old power house converted into inbound freight house

SKETCH SHOWING FLOOR PLAN AND TRACK FACILITIES FOR NEW TERRE HAUTE FREIGHT HOUSE

Freight is received for shipment either from the outside driveway, clearly shown in the accompanying picture, or in case of bad weather or congestion teams can also deliver their loads by way of a covered driveway on the opposite side of the building. The handling of shipments is minimized by placing the names of different shipping points over the four receiving doors along the open driveway. The only trucking required then is to remove the merchandise from these doorways across the platform to the cars, which are spotted on a track extending through the center of the building.

There is a platform between the track and the driveway on either side of the track. The platform floors in the new building are made of concrete. The work of billing merchandise is facilitated by the installation of automatic springless weighing scales.

At the rear of the building a platform has been provided for convenience in transferring shipments from the inbound freight house to the outbound house. The inbound freight house is what formerly was the boiler room of a large power house which stands adjacent to the present new outbound freight house.

The Street Railway "Auto-Superintendent"

A Talk to Railway Managers About the Use of Automobiles by Railway Officials and the Effects of This Practice

(Contributed by the Manager of a Western Property)

HAVE your superintendent and inspectors acquired the automobile habit? If they have not your company is to be congratulated, for, once this habit is acquired, you lose the service of a once efficient official.

To learn if your superintendents and inspectors have formed the habit, you need not follow them about the city. These facts will come to you in the form of complaints from the few street car riders that are left to support street railways. These complaints will cover discourteous treatment by motormen and conductors, failure to stop for passengers, objectionable smoking and spitting in cars, dirty cars, employees smoking on duty, accidents caused by motormen entertaining friends on the front platform, failure properly to safeguard the infirm, the very old and the very young passengers and a good many other complaints of a quite similar nature.

You will also hear from the city officials. Your right-of-way pavement is being neglected, unpaved portions of the track are not kept ballasted, sprinkling of right-of-way is indifferently done, bad low joints are in the track and the traffic ordinances are continuously being violated by motormen.

You will also hear from the bondholders and you will explain to them that the automobile travel is cutting into your gross revenue. So it is, but much of the fault lies with the official who has formed the automobile habit. It becomes too slow for him to ride any longer in the street cars, yet he expects other people to do so. It is pleasant indeed to a motorman or conductor, and to the passengers, on a slow-going street car, to have the street railway superintendent frisk past the street car in his automobile, at a high rate of speed, and "give his dust" to the people in the street car. Not a good example to set as a business getter. It makes a passenger feel that "the world owes him an automobile." He might even feel that his money is helping the corporation buy automobiles for its officials and that street railway fares are entirely too high. Office work is real irksome to the joy-riding official. He neglects this entirely or puts it off for a stormy day when automobile riding becomes unpleasant.

The writer believes that the day is not far distant when owners of public utilities will check up on their automobile expense and eliminate some of the joy riders. They can be found on the payrolls of electric, gas and water companies as well as the street railway company.

Letters to the Editors

"Get the Young Engineer While the Getting Is Good"

To the Editors:

In reading the June 4 issue of the ELECTRIC RAILWAY JOURNAL I found the following article: "Get the Young Engineer While the Getting Is Good." This article takes up the slowness of electric railways in absorbing young engineers into their organization.

I have just been graduated from the University of ——— with the degree of bachelor of science in electrical engineering. I desire very much to attach myself to some electric railway company and "make good" with that company.

Since you are in touch with the various electric railways of the country, perhaps you know of some opening for a young engineer. If so, will you please let me know to whom I should apply. 1921 GRADUATE.

[If any one is looking for a young man like this, his name and address may be had on request.—EDITORS.]

Single Entrance Satisfactory in Terre Haute

TERRE HAUTE DIVISION, TERRE HAUTE, INDIANAPOLIS AND EASTERN TRACTION COMPANY

TERRE HAUTE, IND., June 15, 1921.

To the Editors:

It would seem to me that the very excellent letter of Mr. Gove in your issue of June 11 would serve to close the discussion of safety car design standards that has been had in the ELECTRIC RAILWAY JOURNAL during the past few months, and which I have followed with keen interest.

Perhaps you would not object to granting the privilege of your columns for just a word of approval of those who have urged sticking to Birney car standards.

Some months ago the writer made the statement that we attributed a large measure of our success in the operation of Birney cars to the fact that we had adhered religiously to the standards set by the designer and builder, taking on only such changes on our various and progressive purchases as had been incorporated by the designer and builder for the sake of improvement over the original design. These have involved only an improved truck design and a change in the operator's seat. The statement referred to would be just as true today.

Perhaps the operation of safety cars very nearly six million car-miles in the last two and one-half years and the operation of 100 per cent safety car service during the last six months entitle us to express an opinion. At any rate we have not seen any of the changes in design of the Birney car that, to our mind, improve its serviceability or its adaptability.

We have operated the standard car with every varying degree of density of traffic from 15 cents to 54 cents per revenue car-mile (daily average of 5-cent fare) and we are still "for" it.

I think that some of us tend to the feeling that it is up to us to do not only our own thinking but that

of the public as well. The human race adapts itself to conditions and does not willingly change those conditions as long as they are comfortable and reasonable. The Liberian negro, accustomed to carrying his load on his head, still continued to do so even after the white man had furnished him a wheelbarrow.

I have seen in one of our large cities the bulk of the short-haul passenger traffic handled by motor buses of a seating capacity of twelve to twenty, each of these buses with only one door for both loading and unloading. I doubt if there is a demand on the part of the bus passengers or a serious thought on the part of the bus owners themselves to alter the design of these buses so as to facilitate loading, unloading or provide more standing room.

It seems that many are still of the opinion that the safety car is a small town car and that its design, to make it adaptable to large cities (which after all are in the main simply groups of smaller cities) must be modified or changed. Yet our experience convinces us that a property earning anywhere around 30 cents per car-mile (on the basis of a 5-cent fare) at one-minute headway has a fertile field for the safety car of standard Birney design.

E. M. WALKER.

Railways Should Be Protected Against Unjust Competition

THE SOUTHWEST MISSOURI RAILROAD

WEBB CITY, MO., June 11, 1921.

To the Editors:

When hard surfaced roads are built parallel to steam or interurban lines and are thrown open free to the use of the heavy truck, whose driver many times has little regard for other travel, there is little benefit to the farmer, manufacturer, business man, pleasure rider or consumer. The construction of these roads places an additional burden in the way of taxes, serves only a small portion of the country and allows certain classes to pursue their occupation without paying anything toward road building or upkeep. Eventually such road construction makes the consumer pay more for what he buys and the producer realize less on what he has to sell.

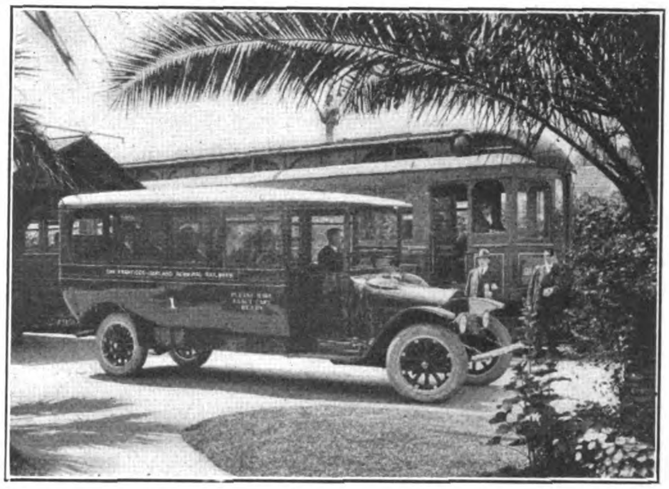
Not many of us ever stop to figure out who it is that is furnishing the money for building good roads, nor what the motive may be when certain routes are selected. But when the acts of a few men directly or indirectly cripple our large enterprises by taking away the cream of their business, the community at large must pay the bill. Let us not fool ourselves nor be fooled by the silver tongued orators into the belief that business can be successfully carried on without invested capital. It makes no difference whether this money is furnished by the federal, state or county authorities or by private subscriptions. Those using these roads for their own business should pay liberally toward the upkeep. The financial standing of a well-managed railroad and public utility is as vital to the life and development of a community as its financial and commercial institutions and should be protected against unfair attacks or unjust competition, so that its customers may receive full benefit derived from such enterprises.

Many of the good old American type of citizens, who believe in equal rights and justice to all, have been slumbering on their rights for years, knowing they were surrounded by Nature's gifts in profusion. **They have expected both the commercial and civic interests to develop, while they sleep on until the country has reached a point where it needs the advice of wise and conservative men. Extravagance, shiftlessness and disregard for the rights of others were some of the lessons learned from the world war. Railroads, public utilities, trucks and automobiles, each has its field and all are essential in the development of our commercial interests. Good roads are needed to develop our resources in every section not served by other means of transportation, but we shall be going backward in a commercial way when we** allow these roads to be built and used to cripple other enterprises.

E. J. PRATT,
General Manager.

Key Route Starts Bus Operation

THE San Francisco-Oakland Terminal Railways, Oakland, Cal., in May, 1921, opened a new line, using gasoline driven motor buses. This line serves as an extension of the company's rail service and extends from the Fortieth Street Station up Piedmont Avenue, thence over the so-called old Moraga Road to the townsite of Montclair, a distance of 291 miles. Four buses have been purchased and two are needed to fill the twenty-minute headway that is maintained from 5:40 a.m. to 8:40 p.m.



THE KEY ROUTE SUPPLEMENTS ITS RAILWAY SERVICE BY OPERATING A LINE OF MOTOR BUSES

Special bodies were built by A. Meister & Son, Sacramento, Cal., and have a capacity of eighteen seated passengers. The bodies are mounted on a 2½-ton White truck chassis of standard design and support. Pneumatic tires are used. The original equipment consisted of Firestone cord tires throughout.

The basic rate of fare for a ride on the bus is six cents with free transfers to and from the city line with which it connects, but no free transfers are issued to the suburban line for San Francisco, with which it also connects.

The underlying reasons for putting in buses in preference to rail service are stated as being purely economic.

The company estimates that with an investment of $26,000 for the four buses, as against one of $138,000 for rail cars and overhead wires including feeders, the service rendered can handle the traffic to be developed for the time being.

Equipment and Its Maintenance

Short Descriptions and Details of New Apparatus of Interest to the Industry. Mechanical and Electrical Practices of All Departments

New Cars for San Francisco

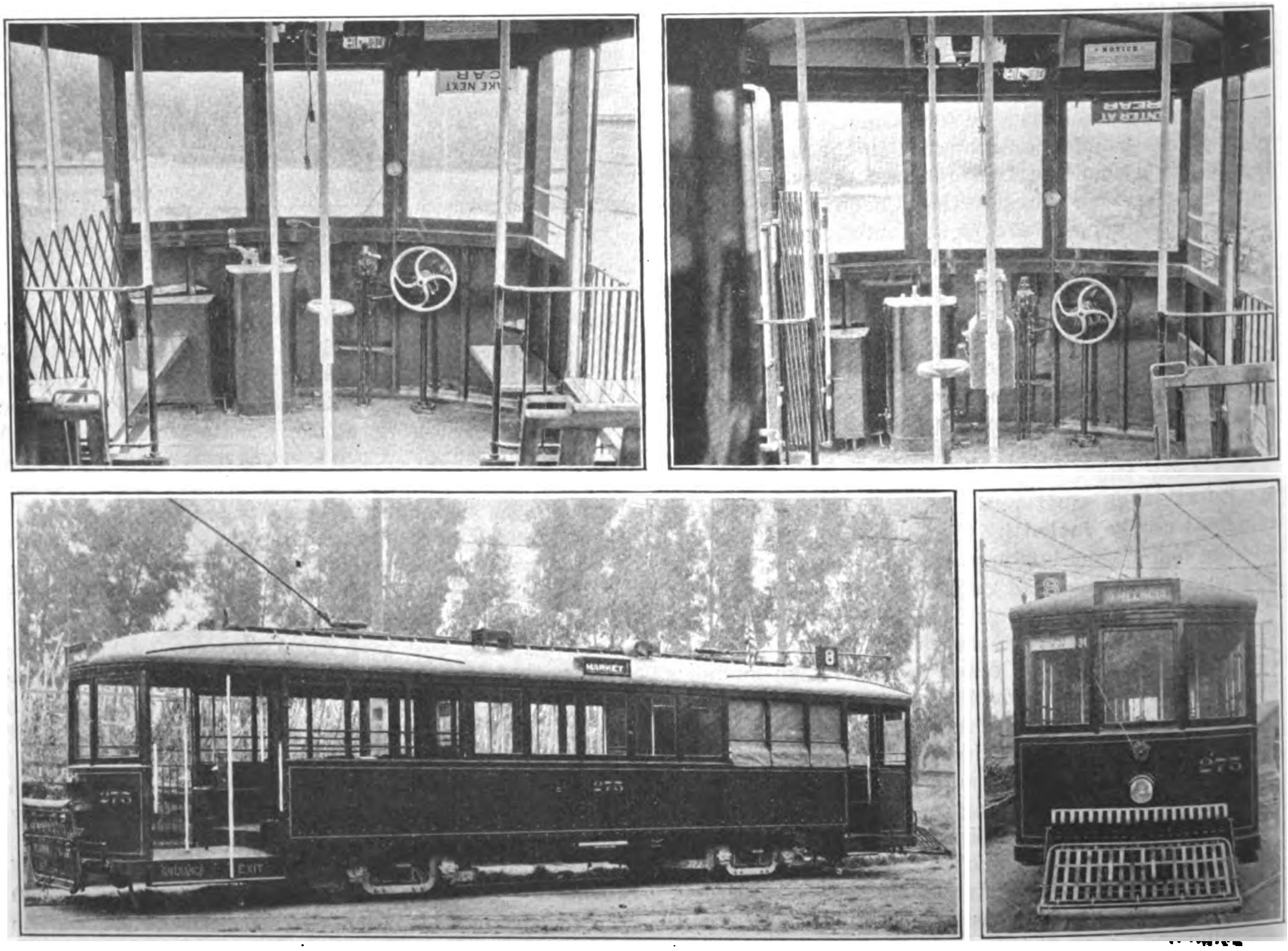
Car Bodies with Steel Sides Applied to a Wooden Framework Built in Shops of United Railroads—Trucks and Motors Taken from Cars that Have Become Obsolete

THE United Railroads of San Francisco have been building their own car bodies since 1913 and have been previously equipping them by using trucks and motors from cars that have become obsolete. During 1920 twenty cars were built and eleven of these have now been placed in service, these cars being equipped with new trucks and electrical equipment.

The new cars are of the open-end type, having a closed central portion 15 ft. 6 in. long with an open portion at either end 8 ft. 5 in. long with a platform 7 ft. 4 in. long. This type of car is popular in California as, due to the local climate, passengers can ride in the open section with comfort during the entire year. The closed section of the car has longitudinal seats, while the open one has four cross seats and two short longitudinal seats, seating two passengers each. There are also four upright stanchions on either side of the car in the inclosed portion. These are made of ¾-in. pipe and extend from the floor to the roof, acting as grab handles, seat supports, roof stiffeners and seat spacers.

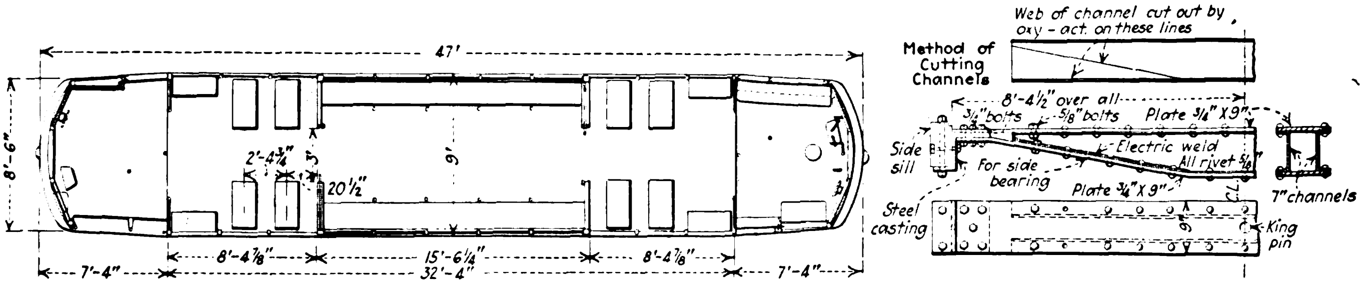
The car body consists of a wooden frame with No. 12 gage steel sides. The entire bottom framing and all posts and plates are of Oregon pine. The inside finish of the closed section is of gum and the sash are of teak. No headlining is used in the car. The entire ceiling is painted a light drab and all stanchions white. Due to the severe dips in the track that exist at junctions of track on steep grades and level track it is impossible to use a lower step of less than 15 in. in height. The platforms have a 2-in. ramp and also a 2-in. crown. There is also a 2½-in. ramp from the end sill to the center of the bolster. The bolster used, as shown in an accompanying illustration, is of somewhat unusual construction. The top consists of a straight plate, while the bottom member has very slight offsets and the end angle is a machined steel casting. The fillers consist of two 7-in. channels, as shown.

Accompanying illustrations show the appearance of



AT TOP, TWO INTERIOR PLATFORM VIEWS; AT BOTTOM, SIDE AND END VIEWS OF THE NEW CAR the car. The open-end portions are equipped with storm curtains, the three curtains for each side being fastened to one roller, which is entirely under the control of the car crew, so that passengers cannot lower or raise them. When in the down position the curtains are fastened to the outside of the car by hooks and tightened manually.

All lighting wires, auxiliary and trolley wires are carried in wooden ceiling moldings which run straight through the car from end to end, and all switches are located above the motorman's head. The power cables are inclosed in a box in the body section of the car and run in duraduct from end sill to controller. Conduit is used for motor leads and resistance wires.



AT LEFT, SEATING PLAN OF NEW SAN FRANCISCO CAR. AT RIGHT, BOLSTER CONSTRUCTION

The car seats fifty passengers and weighs 36,000 lb. complete. The trucks with wheels and axles weigh 11,560 lb. and the motors, gears, pinions, etc., 7,760 lb. The car body with all attachments weighs 16,680 lb. The trucks are the Standard 0-40 double-truck type with 4-in. axles and 30-in. wheels. Other equipment details consist of the following: Four GE-247-D 40-hp. motors, two K-28-E controllers, two MA-13 fuse boxes, two MR-13 circuit breakers, two US-15 trolley bases, one DH-10, 10-ft. Westinghouse compressor, one 8-in. brake cylinder, one type E-1 American slack adjuster, one 16 x 45 air reservoir, one Westinghouse type H-1 emergency valve, two conductor's valves, U. R. R. car signs, Johnson fare boxes, Golden Glow headlight.

Safety Devices on Bay State Cars

Ways in Which Eastern Massachusetts Street Railway Is Equipping Its One-Man Cars to Conform to the Order of the Department of Public Utilities

By W. C. Bolt

Superintendent of Rolling Stock and Shops, Eastern Massachusetts Street Railway, Chelsea, Mass.

ON NOV. 8, 1920, the Department of Public Utilities of the Commonwealth of Massachusetts entered an order relating to safety devices on street railway cars. One of the requirements of this order called for the installation of additional safety devices on so-called one-man cars. The section of the order follows:

> Every street railway car operated by and in charge of one man shall be equipped with either (1) a device so designed and maintained that upon the release of the controller of the car by the operator the motive power will be cut off from the propelling motors of the car and the brakes will be applied, together with a device located in a conspicuous place to the rear of the front platform and vestibule of the car and accessible to passengers by the operation of which a door at the rear of the car will be unfastened so that it can be opened from the inside of the car, or (2) shall be equipped with a device located in a conspicuous place to the rear of the front platform and vestibule of the car and accessible to passengers by the operation of which the motive power will be cut off from the propelling motors, the brakes applied and a door at the rear of the car unfastened so that it can be opened from the inside of the car. Instructions as to the location of said devices accessible to passengers and their use in an emergency shall be posted in a conspicuous place in the car.

The first part of the above order referred to the standard Birney car, and to conform with the requirements of the Department of Public Utilities, as applying to the 250 Birney cars which the Eastern Massachusetts Street Railway now has in regular operation, a standard conductor's valve is being installed, located in the center of one side of the car immediately below the advertising rack molding. This conductor's valve is connected with the emergency control line by means of a ⅜-in. pipe. The operation of this valve by a passenger will apply the emergency brakes, cut off the power from the propelling motors and unlock the rear door, as well as supply sand to the rail. The following sign is being installed adjacent to this conductor's valve instructing passengers in the use of the valve:

EMERGENCY VALVE

In case of accident, PULL CORD *to stop car and unlock rear door*

The second section of the order relates to cars which are not equipped with the standard safety devices and applies specifically to some 420 double-truck cars which the Eastern Massachusetts Street Railway is operating on the one-man plan at the present time.

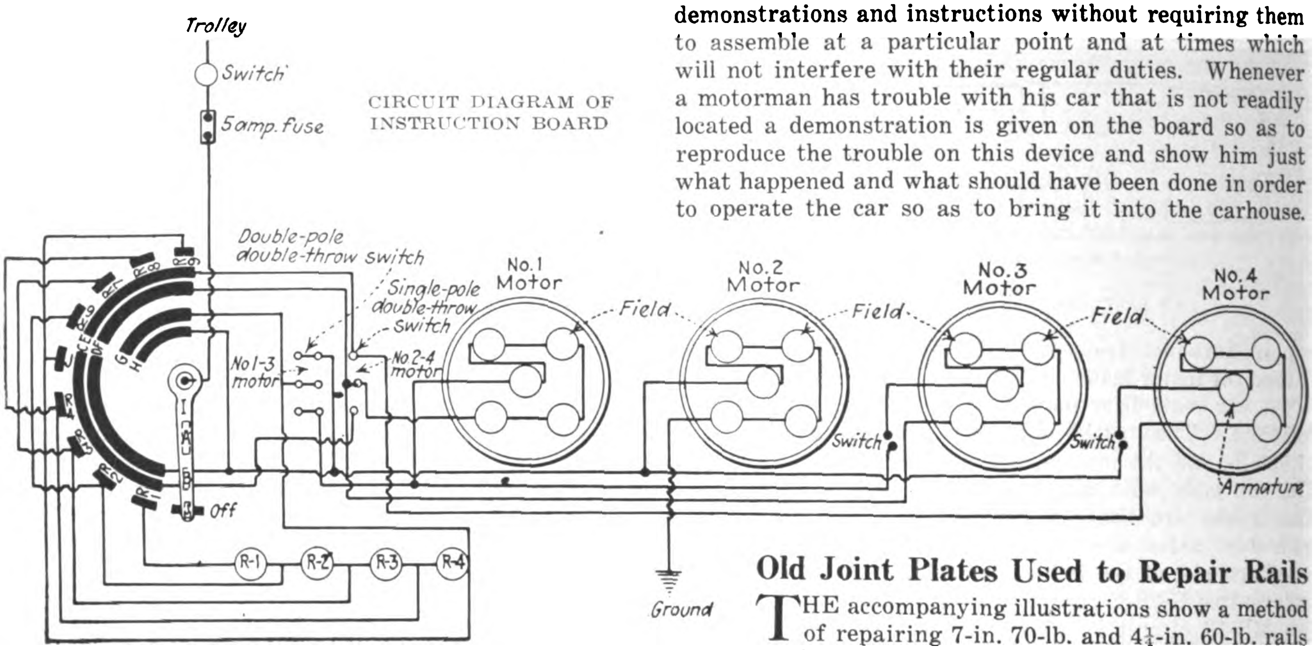
To conform with the order, as applicable to these double-truck, one-man cars, our company made a thorough study of the problem in conjunction with the leading equipment manufacturers, which resulted in the installation of the following equipment: Each car will be equipped with a conductor's valve located in the center, on one side of the car. This conductor's valve is connected with an emergency valve located on the inside of the car, underneath one of the seats, and is also connected with two pneumatic door engines; one on the right-hand door of each vestibule. A separate pipe line operates a small circuit breaker knock-out cylinder and, when application is made, throws the master control switch, thus cutting off the power. On some cars which are not equipped with a master control switch, two small knock-out cylinders are installed, throwing the two circuit breakers. On other cars the knock-out cylinder operates a small control-circuit switch.

To provide sufficient reserve of air in case of emergency, an additional air reservoir is likewise being installed on these cars, thus providing reserve air which is passed directly into the brake cylinder. When the installation is complete, any passenger, in case of accident, by pulling the cord attached to the handle on the conductor's valve, can shut off the power from the propelling motors, apply the brakes to the car and unlock the rear door of the car, thus performing the functions required by the Public Utilities Department. A sign similar to the above is being installed on these cars also.

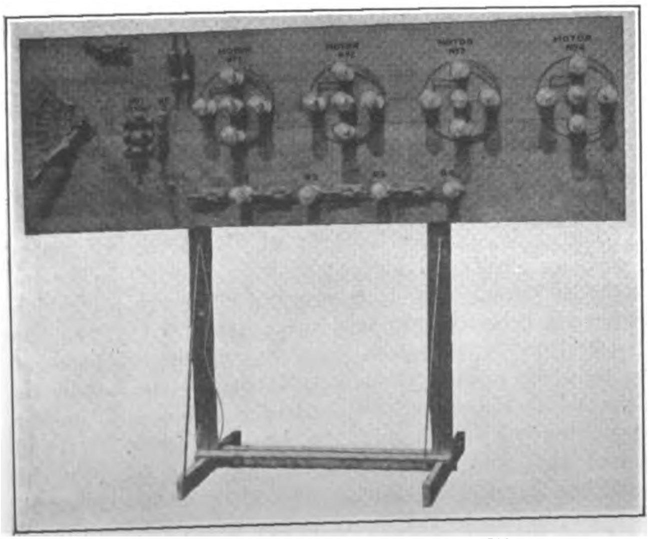
Portable Instruction Board

Device in Use by the Kentucky Traction & Terminal Company for Instruction of Motormen Has Proved of Great Assistance in Insuring the Proper Operation of Cars and Equipment

THE accompanying illustrations show a portable instruction board designed by E. M. Carr, general shop foreman Kentucky Traction & Terminal Company, for use on its system to instruct motormen in the various operating circuits of cars. The board shown is for a four-motor equipment, but a similar board can be used for a two-motor equipment if desired. The circuits through the motors and resistors are indicated by lamps. The motor circuits consist of four groups of 23-watt Mazda lamps, each group consisting of five lamps and each group representing a motor. Of the lamps in each group the center lamp represents the armature and the four other lamps the four field coils. Four lamps located at the bottom of the board represent the car resistors. The several steps of the controller are provided by operating the rheostat at the left of the board. By feeding this controller a notch at a time, the exact conditions under which the motors successively receive their current are shown.



CIRCUIT DIAGRAM OF INSTRUCTION BOARD



PORTABLE INSTRUCTION BOARD

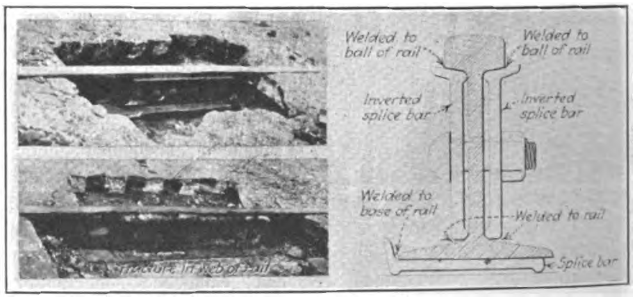
Defects in motors, cables, rheostats, etc., are imitated by unscrewing lamps from the sockets so as to break the circuits and by the use of cut-out switches shown on the board. These cut-out switches are also used to demonstrate how a car which may "have trouble" can be operated. The circuits are arranged so that they can be operated on 500 or 600 volts as available.

As the board is portable it can be taken to the different carhouses on the system and motormen can be given demonstrations and instructions without requiring them to assemble at a particular point and at times which will not interfere with their regular duties. Whenever a motorman has trouble with his car that is not readily located a demonstration is given on the board so as to reproduce the trouble on this device and show him just what happened and what should have been done in order to operate the car so as to bring it into the carhouse.

Old Joint Plates Used to Repair Rails

THE accompanying illustrations show a method of repairing 7-in. 70-lb. and 4½-in. 60-lb. rails used by the Springfield Traction Company, Springfield, Mo. Previous to the use of this method the practice of the company was to cut out the defective sections of rail and replace with sections about 8 ft. long. This method of repair required two sets of joint plates, and in addition the expense for cutting out the section was somewhat high.

The method now used consists of using old continuous joint plates by cutting off the portion that goes underneath the rail but leaving the flange at the other end. These plates are applied to the joints with the wide flange uppermost as indicated in the accompanying illustration. In addition to using one of these joint plates on either side of the T-rail an additional plate is placed underneath the rail joint and all three plates are welded along the edges as indicated. This type of construction has proved extremely satisfactory on a line with two and one-half minute headway.



AT TOP, LEFT, JOINT READY FOR WELDING; AT BOTTOM, LEFT, JOINT WITH REPAIRS PARTLY COMPLETED; AT RIGHT, INVERTED SPLICE BAR WELDED RAIL JOINT

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

$4,000,000 for Improvements

Mr. Mitten Plowing Money Back Into Property and Increasing the Stockholders' Equity

Approximately $4,000,000 from earnings will be plowed back into the property of the Philadelphia (Pa.) Rapid Transit Company during 1921 in additions and improvements. According to President T. E. Mitten adequate provision for necessary repairs, renewals and improvements could not be made during the wartime period. Militating against carrying out the work then were the high cost of material, the impossibility of securing sufficient labor and the money shortage due to delay in securing increased fare.

The very extensive program of repaving undertaken by the city requires during this year the rebuilding of more than 90 miles of track construction, or more than double the usual undertaking. Besides there are more than 60 miles of trolley wire renewals, and certain car improvements, representing the making of center exits on near-side cars, the purchase of one-man cars for the unimportant outlying lines, the purchase of modern snow sweepers, and additional shop and carhouse facilities.

Of this $4,000,000 which it is planned to spend $2,000,000 represents renewals to property and will therefore be added to operating costs. The remaining $2,000,000, representing additions to property, is properly capitalizable, but because of the fact that the company has no securities now salable from which new capital can be secured, the estimated $2,000,000 of net earnings for 1921 which would otherwise be available for dividends on stock must be used to meet the cost of this new construction.

The practice of appropriating Philadelphia Rapid Transit surplus to provide for the capital needs of the property conforms with the procedure of the past ten years of the present management. During that time there was earned a surplus of $10,051,000. Of this, however, only $5,846,000 was declared in dividends. The remaining $4,195,000 has been used for construction purposes and acquiring new property.

In the matter of traffic handled Mr. Mitten stated that for each of the ten years 1911-1920 there was an average yearly increase of 46,827,145 passengers. The system, however, during the first five months of 1921 not only suffered the loss of this normal increase, which approximates 4,000,000 passengers per month, but has actually carried 24,401,705 fewer passengers than were carried during the same months of 1920. In May alone the traffic decreased 10 per cent, which, if it continues, will mean supplying the public with 10 per cent better service.

Passenger earnings for the first five months of 1921 increased $2,451,456 over the corresponding period of 1920. Mr. Mitten says that $4,500,000 of increased passenger earnings for the full year 1921 as compared with 1920 is all that can be now counted on in view of this declining rate of monthly increase. Operating costs are higher because of the increased allowance required for renewal account necessary to make the desired improvement in the condition of the property. This, together with sundry improvements in service, will not only use up the money saved through decreased wages, but in addition serve to increase considerably the total costs of operation. The net income for the year 1921 is estimated at $2,000,000.

Pittsburgh Receivers Authorized to Start Improvements

The receivers for the Pittsburgh (Pa.) Railways have been authorized by the United States District Court to proceed with the company's share of the work of widening East Carson Street from the Smithfield Street Bridge to South Seventh Street. This authorization has eliminated litigation which threatened a long delay in the work as the city had previously filed a bill in equity asking that the receivers be compelled to perform this work. Litigation over this bill would have delayed the improvement for months as had there been an adverse decision in the suit in the District Court the city had intended to appeal to the higher Federal courts.

The thoroughfare, one of the big municipal projects, is to be widened from a 50-ft. to a 75-ft. street, at a cost of $500,000. The cost to the receivers of the Pittsburgh Railways will be $115,000. The receivers asked the court for the authority to do the work. With this permission granted it is hoped to have the work finished by October. The railway will relay and realign its tracks, relay the paving within the track area and 1 ft. on either side with reclipped stone block paving, and make such changes as are necessary in the overhead construction.

Trackless Trolley Considered for Toledo.—Street Railway Commissioner Cann at Toledo, Ohio, is collecting data on the trolley bus and has already intimated that such cars may be used to provide a new cross-town line in that city.

Arbitrators Cut Wages

Men on New York State Lines Reduced 11.7 per Cent—Maximum for Trainmen Fifty-three Cents.

Motormen and conductors of city lines of the New York State Railways will get a basic wage rate of 53 cents an hour from May 1 of this year to May 1, 1922, under an award announced on June 18 by the arbitration board, consisting of Judge Arthur E. Sutherland, impartial member, and B. E. Tilton and James H. Vahey, representing the company and the Amalgamated Association, respectively. This is a reduction of 11.7 per cent under the basic rate of 60 cents an hour of the 1920 agreement.

By this award motormen and conductors serving for the first three months will get 49 cents an hour, for the next nine months 51 cents, and after a year the full 53-cent rate. The pay of shop men and miscellaneous employees is reduced 2½ per cent from the rate fixed a year ago, and watchmen, car cleaners, car washers, track sanders, track cleaners, flagmen at crossings, chauffeurs, car placers and unskilled laborers generally are reduced 15 per cent.

Under this award the lowest rate that will be paid will be to unskilled carhouse and other laborers. They will get 42½ cents an hour.

There were 102 proposed changes in the working agreement, most of which were disposed of by agreement between Mr. Tilton and Mr. Vahey without the interposition of Judge Sutherland. Few changes, however, over the 1920 agreement were decided on, and those that are made were decided on in the expectation they will result in betterment of service and will tend to greater efficiency and simplicity of operation without injustice to anyone. The provision for the basic nine-hour day is continued, with a leeway of three-quarters of an hour to complete schedules when necessary.

No important changes are made in the matter of "swing" runs. The company proposed they should be completed within fourteen consecutive hours and in no case exceed fifteen hours. The 1920 contract provided that at least 60 per cent of all schedule runs shall be laid out with outside time not to exceed eleven hours, and "in no case is a schedule run to have outside time in excess of fourteen hours." Provision for overtime extra under this clause, in the 1920 contract, is discontinued, however, but the men are given the option of working this overtime.

By the award motormen and conductors on interurban lines of the company will get a basic rate of 55 cents an hour. For the first three months they get 4 cents an hour less and for the next nine months 2 cents an hour less. Lines affected are the Utica Interurban, Sodus Bay Line, and the Rochester & Eastern. Men of the Oneida line get 3½ cents an hour more.

The award provides that operators of one-man cars, now running in Syracuse and contemplated for Utica, shall get 5 cents an hour more than motormen and conductors. This is the demand made by the men.

All three of the arbitrators signed the award.

City Outgeneraled by Company Talent

Paul H. Maloney, Commissioner of Public Utilities at New Orleans, La., in a lengthy report to the Commission Council on June 14, confirms the opinion generally prevalent that the present city administration is unable to cope with the traction problem and is sorely in need of men with proper training and experience adequately to safeguard the interests of the city. He said:

> It must be remembered that the present administration is a new one, unfamiliar with the affairs of the city of New Orleans and without the benefit of experience or expert training and advice.

He contrasted the position in which the city now finds itself with that of the New Orleans Railway & Light Company, with its formidable array of legal and engineering experts, who were, he said, conducting a "propaganda campaign" against the city authorities, through C. C. Chappelle, whose plan Mr. Maloney rejected.

Mr. Maloney thought the Chappelle plan was formulated for the purpose of "undermining the Commission Council rather than to seek a settlement based upon a fair and equitable basis." He believed the city authorities had "piddled" long enough with the situation. The time had come, he said, when definite and concerted action should be taken by the Council. He pleaded for an organization of experts in banking, engineering, accounting and law which would be able to assist the city in its battle for reasonable rates and service.

Mayor McShane concurred in the views held by Commissioner Maloney.

Commissioner Black believed that Commissioner Maloney's suggestion was one that should have been carried out long ago. He said:

> We have been going around armed with a sling shot to attack an entrenched giant. We must arm ourselves with a weapon that will dislodge the forces against us and we cannot do it without the assistance of technical men to supply the things we need.

Mr. Murphy, of the committee on finance, objected to the immediate adoption of the Maloney plan, because of the financial outlay involved.

The report was referred to the committee on finance. It will come up for discussion and consideration at the next meeting.

More Wage Cuts

Arbitrators Reduce Wages Below Offer of Company, Which Men Rejected —48-Cent Maximum

Platform employees of the Cincinnati & Dayton Traction Company will receive a maximum wage of 48 cents an hour, in the case of those employed on the interurban division, and 45 cents an hour in the case of those operating on the Hamilton city cars and the Dayton city cars, as a result of the decision of the board of arbitration agreed upon to settle the controversy between the company and Division 738 of the Amalgamated Association. The board completed its work a short time ago, with the vote of the men's representative dissenting.

State Industrial Commission Appointed the Referee

The board was composed of Mahlon Gebhart, Miamisburg, representing the employees; Samuel D. Hutchins, Columbus, representing the company, and Prof. Joseph S. Myers of Ohio State University as the third arbitrator, or referee. The referee was chosen by the Ohio Industrial Commission, after the representatives of the company and men had failed to agree on a selection.

A change in the contract agreed upon names one of the federal judges of the Southern District of Ohio as the appointing power in case of disagreement over the selection of a third arbitrator in future disputes, instead of the State Industrial Commission.

The wage rate for the trainmen agreed upon by the members of the commission is as follows:

Interurban men: 44 cents an hour for the first three months; 46 cents, next nine months; 48 cents, thereafter.

Hamilton and Dayton city divisions: 41 cents an hour, first three months; 43 cents next nine months; 45 cents, thereafter.

Helpers on freight cars are to get 40 cents an hour.

Under the agreement existing before the new rate became effective, the maximum pay was 51 cents an hour. The large increase asked by the men was refused by the company, which offered as a counter proposal to continue the existing rate, under which interurban men received 51 and city men 50 cents an hour. The men refused this in turn and arbitration was agreed upon. The men would have gained had they accepted the company's counter proposal.

Five City Systems in Dayton

Dayton has five distinct city railway systems. In the case of the Dayton city system, whose employees are receiving a maximum of 62 cents under an arbitration award made on July 6, 1920, of which Mr. Hutchins was a member, this company has posted notices that effective on July 6 this year, the maximum will be reduced to 45 cents an hour.

One of the changes agreed upon by the arbiters in the Cincinnati & Dayton Traction Company dispute is that changing the status of men who have been discharged by the company. The old agreement forbade rehiring after discharge, but the new code reads that "such employees shall not be re-employed in a like capacity within a period of six months."

Power House Strike to Be Arbitrated

Pending arbitration the strike of stationary engineers employed at the power houses of the Cincinnati (Ohio) Traction Company is at an end. All the men who went out on May 30 have returned to work and all inclines with the exception of the Bellevue are again in operation. The Bellevue is closed down for repairs. Under the terms of the arbitration agreement the company and the union will select representatives and should they not be able to agree on the third member within ninety days he will be named by Superior Court Judge Robert S. Marx. The traction company has designated J. A. Brett, district manager of the Westinghouse Electric Company, as its arbitrator. Business Agent C. B. Manwood, of the union said the executive board of the organization would name its representative at once. The decision of the arbitration board will be retroactive to the time the men went to work. The engineers struck against a decision of the company to reduce their wages from 90 cents to 65 or 70 cents an hour. The men demanded the continuance of the old scale of 90 cents an hour.

Wage Reduction Under Consideration

The management of the Interborough Rapid Transit Company, New York, N. Y., has taken up in friendly discussion with the officers of the organization representing the men the matter of the revision of the present working agreement some time between now and its expiration. The hope is to reach a conclusion which in the light of the financial condition of the company will be to the best interest of the employees themselves as well as of the company.

The present agreement between the management and the men expires on Jan. 1 next.

The last increases in wages were made by the company in August, 1919, at which time wages were increased 25 per cent above the rates in the working agreement covering wages then in existance, and in June, 1920, when wages were increased 10 per cent above the rate in effect on Aug. 1, 1919.

The principle behind these adjustments of wages was the increasing cost of living, the company recognizing this high cost of living as a fact which had to be considered even in the face of an existing working agreement. In this connection the company explains:

> Beginning practically with the date of the last increase the reverse of this has been true, and the cost of living as shown by the same government statistics has been steadily declining for some time—a fact generally recognized and admitted.

Home Rule and Five-Cent Bills Lost

New Public Utilities Act Passed in Illinois, but Only After All Dangerous Features Were Eliminated

The so-called 5-cent fare bill fathered by Mayor Thompson of Chicago was voted down and thrown into the discard with the adjournment of the Illinois State Legislature on June 19. At the same session a new public utilities commission bill was approved which is supposed to hold out the hope of "home rule" over some of Chicago's utilities. The outcome on both these bills was a sore disappointment to Mayor Thompson and his followers and was preceded by bitter debates which stretched the session up to the legal time limit.

GOVERNOR SMALL was closely allied with the Chicago political element and used every effort to save both measures. After adjournment he issued a statement expressing his disappointment and announcing that he would call a special session so that the legislators might have time to reconsider. There was comment to the effect that Mayor Thompson would use his influence with the present commission to bring about a reduction at once in the 8-cent fare of the Chicago Surface Lines.

COMMISSION NAME CHANGED

If Governor Small approves the new utilities act the commission will be known hereafter as the Illinois Commerce Commission. Its membership will be increased from five to seven members and seven assistant commissioners. Another change in the present law will allow appeals to the Circuit Court of the local county instead of to the Circuit Court of Sangamon County only. The bill was stripped of the clause giving city councils power to initiate a referendum for home rule. This can only be attained by a petition signed by 25 per cent of the registered voters in a community. The Legislature also wiped out the section which would prevent the commission from setting aside contracts between municipalities and utility corporations.

An attempt was made to strike out the whole home rule section of the bill. This failed, but the measure was amended to provide that if home rule is established in any community rulings may be appealed to the state commission and from that body to the local Circuit Court and thence to the Supreme Court. Inasmuch as home rule can be established only over utilities entirely within the city limits, this is said to eliminate all except the surface lines and the gas company in Chicago. It is contended that the bill in its present shape is not more drastic than the existing measure.

MAYOR THOMPSON FOUGHT THE FIGHT

The fight on Mayor Thompson's 5-cent fare bill was one of the features of the closing days of the Legislature. This bill provided that surface and elevated lines might be acquired, with the approval of the people, through the creation of a "transportation district"; that operation of the lines would be conducted by nine trustees; and that the "district" would have authority to issue bonds for purchase of the railway properties. The Mayor suffered his most serious defeat when the 5-cent clause was stricken out. It was intended that any deficit to meet costs would be made up by general taxation. Mayor Thompson went to Springfield to urge passage of his bills and he admitted that he would favor 4-cent, 2-cent and even 1-cent fares if the people voted for such rates. He even was quoted as saying that he would favor free street car service if the people voted for it. This roused some of the Senators to much stronger opposition.

As finally amended the bill allowed the board of trustees to determine the rates of fare and charges upon transportation systems and a referendum would be required on all bond issues. It was also provided that no community would be combined with a "transportation district" without consent of its voters. With all these amendments taking the political attractions from the bill the measure was lost by a close vote in the closing hour of the legislative session.

Railway to Run Buses

Connecticut Company Announced Plan at Bridgeport Hearing Before Public Utilities Commission

Under the recent authority granted by the State Legislature the Connecticut Company proposes to establish five motor bus routes, three in Bridgeport. This announcement was made at a hearing before the State Public Utilities Commission held at Bridgeport June 21-22, on applications for certificates of public convenience and necessity to operate motor buses in Bridgeport and vicinity after July 15 when all motor bus lines come under the jurisdiction of the Commission.

The Connecticut Company, President Storrs said, was prepared to undertake a bus service complementary to that of the electric railway with a free interchange of transfers within the city area between the buses and trolley cars.

The city of Bridgeport petitioned for the authorization of thirteen routes some of which competed with the trolley. Under the city's plan the number of buses in operation would be cut from 200 to 88. More than 500 sought permits to operate these routes, modification of which was asked in some cases. One application from the American Transit Company, a recently formed stock corporation, sought the right to operate all routes as laid out. It was brought out that the city was probably 50-50 for trolleys and jitneys and would resent the loss of either.

Percy T. Litchfield, head of the city's traffic commission, represented the local Chamber of Commerce. He declared that a limited bus system was necessary in addition to the trolley service and that if the railway would meet the needs for bus lines on some routes no other permits should be given. The chamber wanted to see the trolley system get on its feet and be alive to modern conditions. In short, transportation by motor vehicle has come to stay no matter what fare may be required to support the service. If the officers of the railway took advantage of the rights they now have to operate supplemental bus service, it would be possible for them to handle the situation, but with their trolley cars alone they cannot do it since the people have experienced the advantages of the jitney service.

The company in its testimony brought out that in 1920 for the Bridgeport division operation expenses and taxes exceeded revenues by $470,000.

No allowance is made for depreciation. In the Commission's own valuation for this division of $8,000,000, based on 1910-1914 prices or of $14,400,000 on 1919 prices an 8 per cent return would bring the losses up to more than a million dollars, exclusive of any allowance for depreciation. For the first four months of 1921 with service materially curtailed and the closest watch over expenditures and every possible economy, the operating expenses and taxes still exceeded the revenues by $17,818.

For Labor Unions: A Receipt for Immortality

An editorial with this title from *America at Work*, a publication issued in St. Louis, has been reprinted in pamphlet form by Ivy L. Lee. The editorial declares that the labor union should not place so much emphasis on the possession or non-possession of a union card, but should declare its interest in "good working conditions, good wages and the highest possible standard of craftsmanship." It says that all "closed" shop organizations are despotisms, whether they are a church, university, school of medicine or labor union, and that union labor should go as far as modern churches, schools, physicians and insurance companies in placing emphasis on the end and not the means, on the aims of the organization and not on membership in the organization itself.

The pamphlet also says that mere display of power will not insure immortality. Modern men do not back down before power as such at all. They only yield respect to the foundation of power, and power in a democracy can have no permanent foundation except in service.

Byllesby Property Slightly Damaged

According to a recent statement the Arkansas Valley Railway, Light & Power Company, a Byllesby property, suffered only slight damages in the Pueblo cloudburst and flood. R. G. Hunt, assistant to the vice-president of the Byllesby Engineering & Management Corporation, was one of the first outsiders to reach the scene of the disaster. He said in part:

> Our street railway during the early hours of the flood continued in service, carrying the panic stricken out of the flood district. The cars operated until it was no longer possible to operate the power plant. There were many notable instances of individual bravery. Construction Superintendent Phythian, who stuck to the power house to the last, was marooned on top of the new steel structure all night. Early next morning when the waters had subsided he attempted to wade out, and was caught in the swirl of water. After a hard battle for his life he was drawn to safety by means of a rope thrown to him.

Stockholders of the company have been assured of their investments by means of a circular letter sent out on June 14, after the property loss had been ascertained. The management states that the Pueblo plant will be in full operation in two weeks.

Evidence Piling Up Favorable to Hydro-Electric Project

Bion J. Arnold's report received further consideration from the Ontario Hydro Radial Railway Commission during the week ended May 14. Frank A. Sager, managing engineer for Mr. Arnold, gave evidence in the absence of the latter from the city.

The Toronto Suburban system, as projected, will consist of the existing lines of the Toronto Suburban Railway operating from Keele Street to Guelph, to Woodbridge and to Weston, as well as the present Davenport, Crescent and Lambton lines. Mr. Arnold suggested that the Guelph division be changed and the cars operated right into the downtown terminal in Toronto, in 1925, by constructing then a connection from Lambton to the Toronto-St. Catharines Radial at Swansea via the old belt-line route.

The traffic counts made in Toronto showed that of the total traffic carried by the street car lines in that section 48 per cent was rush-hour traffic carried in the three busy hours of the day; 6 a.m. to 8 a.m. and 5 p.m. to 6 p.m. The other 52 per cent was distributed over the remaining sixteen hours of the operating day. This showed that Toronto probably had a higher traffic peak than any other city in North America. The practice of selling eight tickets for 25 cents for rush-hour riding was wrong from a financial point.

With respect to the interurban service of the Toronto & Eastern, which it was proposed should be operated to Bowmanville, 40 miles, it was shown that the riding habit of the population in that territory would mean 1,640 passengers per day into the Toronto terminal. This estimate did not include the actual count of passengers riding between stations along the route.

Dealing with operating expenses of the whole system of hydro-radials, Mr. Sager submitted figures of fourteen radial lines in the United States showing a range of 60½ down to 32.4 cents per car mile. The hydro-radial figures for the five divisions were 28.7 cents. This difference was accounted for by the fact that the hydro system as proposed was the only one on the American continent having 300 miles of lines that embraced rapid transit, interurban, express and heavy freight services.

The Guelph Radial Railway system has been transferred to the Hydro Commission in accordance with the Order-in-Council recently passed by the Ontario Government. Manager House will be retained as the operating head by the commission.

News Notes

Little Rock Men Win.—Union employees of the Little Rock Railway & Electric Company, Little Rock, Ark., won their wage controversy from the company in an award handed down by the board of arbitrators on June 10. The vote was unanimous against a decrease in the men's present scale of from 46 to 51 cents. The award will serve as a one-year contract.

$1,000,000 Electrification Project.—The Electric Short Line, Minneapolis to Hutchinson, Minn., is to be extended 25 miles and electrified. The estimated cost of the project is $1,000,000. Work is expected to begin by July 1. The overhead trolley will replace the gas-electric and oil-burning locomotive. E. D. Luce, president of the company, is a member of the executive committee of the American Short Line Railway Association.

Five Cents an Hour Wage Cut.—Motormen on the lines of the Sault Ste. Marie (Mich.) Traction Company were recently informed of a wage cut of 5 cents an hour. The reduction became effective on June 1. The wage was 48 cents an hour. Manager Taylor announced that this action on the part of the company was necessary and that the recent increase in fares had not materially affected the financial condition of the company.

Trackless Trolley Under Consideration.—The trackless trolley is being considered for adoption in Grand Rapids, Mich., as a solution for the present need of extensions to existing lines of the Grand Rapids Railway. Officials of the railway do not believe that the proposed innovation will be feasible for thoroughfares which carry heavy traffic, but it is thought that many residence streets in outlying portions of the city where extensions are needed might prove ideal for the operation of such lines.

Wage Cut Rejected.—The employees of the Atlantic City & Shore Fast Line Railroad, Atlantic City, N. J., have refused to accept a proposition made to them by the management that the men take a voluntary 10 per cent reduction in wages to assist in the effort to get back to normal living conditions.

Wage Offer Rejected.—The trolley men of the State have rejected the wage offer of the Connecticut Company, which fixed a minimum of 49 cents for the beginner and a maximum of 54 cents an hour for the old-timer. It is said that by a four to one vote the local conductors and motormen at New Haven rejected the offer, which is the second one and about a nickel an hour better than the first offer, which also was rejected by a referendum vote of the men. It is believed that the matter will go to arbitration.

Wages Cut in Dayton.—It is expected that all railway properties in Dayton, Ohio, will unite in a uniform wage reduction. Managements of the Oakwood Street Railway, the Dayton, Springfield & Xenia Southern Railway and Dayton Street Railway have announced a wage cut of practically 17 cents an hour. The new scale will be 41 cents for the first three months, 43 for the next nine months and 45 cents for all over twelve months' service. The present scale is 58, 60 and 62 cents an hour. The cut is scheduled for July 6.

Wages Increased in Worcester.—An increase in wages of 3 cents an hour for trainmen went into effect on June 1 on the lines of the Worcester (Mass.) Consolidated Street Railway under a contract that terminates on Dec 31. It is said that the added expense to the company until the end of the year will be $80,000. The new wage scale will give employees for the first three months' service with the Consolidated 58 cents an hour; for the next nine months, 63 cents an hour, and after the full year's service the men will receive 68 cents an hour.

London Workshop Cost Underestimated.—In a previous item in the ELECTRIC RAILWAY JOURNAL on the erection of workshops by the London underground electric railway companies and the London General Omnibus Company the cost of the project and the area covered were inaccurately stated. The railway shops will cover an area of 28½ acres and will cost approximately £450,000 inclusive of price of land, cost of buildings and equipment. The omnibus depot will cover 30 acres and will cost approximately £500,000 inclusive of the land, buildings and equipment.

Franchises Surrendered in Indiana.—Local franchises in six cities—South Bend, Mishawaka, Elkhart, Goshen, Laporte and Michigan City—have been surrendered by the Chicago, South Bend & Northern Indiana Railway, which made application recently to the Indiana Public Service Commission to operate under indeterminate permits. This is the second large corporation outside of Indianapolis to accept indeterminate permits granted under the act which established the public service commission and abolished the railroad commission.

Men Accept Wage Cut.—Officials of the Southern Indiana Gas & Electric Company, Evansville, Ind., recently signed an agreement with the union for one year, calling for a reduction in wages amounting to 18 per cent. The men working on the city cars under the new agreement will receive from 36 to 43 cents an hour; the men on the interurban cars from 38 to 43 cents an hour and the men on the one-man cars will get from 40 to 45 cents an hour.

To Pull Together for Mutual Benefit.—The San Francisco-Oakland Terminal Railways, Oakland, Cal., has recently created a Department of Personnel "for the systematic supervision, study and improvement of the human element in organization." The new department will have as its watchwords, justice, co-operation and economy. In taking a personal interest in every employee the Committee on Personnel will know what employee should be transferred to other departments, who should be advanced, etc. The training of platform men will be one of the duties when space and equipment are available.

"Electric Railway Service" Suspends.—The Detroit (Mich.) United Railway has suspended publication of *Electric Railway Service*, established in June, 1913, and the forerunner of many similar publications issued at this time. Economies are necessary and the company being opposed to carrying advertising in the publication, "it is quite necessary that suspension follow when the revenues are not sufficient to meet expenditures." In conclusion this opinion is expressed: "We feel sure that thousands of our friends and patrons will rejoice when conditions change and a renewal of publication becomes possible."

Federal Commission to Study Waste.—A federal commission to study waste elimination in industry is proposed in a bill which has been introduced by Senator Calder. The bill is intended to continue and to amplify the survey made by the Federal Engineering Societies at the instigation of Herbert Hoover, who at that time was president of the organization. The commission is to be composed of seven commissioners to be appointed by the President, and the Secretary of Commerce is to be chairman of the commission. The final report is to be made on or before Sept. 21, 1922. The report is to cover waste in "timber, power, transportation, oil, coal, essential minerals and other basic raw materials." The commissioners are to serve without salary.

No Plans Formulated by Commission.—F. H. La Guardia, president of the Board of Aldermen, New York, N. Y., recently issued a statement in which he charged that "all promises of new lines and new extensions made when the new transit law was under discussion were empty promises not capable of being kept." This statement was made as a result of the failure of Mr. La Guardia to exact a pledge from George McAneny, chairman of the new transit commission, that a 5-cent rate of fare would be retained on the rapid transit lines. This promise would have been reciprocated by the Board of Estimate appropriating funds for the commission. Mr. McAneny's letter to Mr. La Guardia stated that no conclusion had been reached in relation to the commission's plan.

Wages Remain the Same.—A wage settlement for the year ending May 31, 1922, has recently been effected directly between the Asheville Power & Light Company, Asheville, N. C., and its trainmen on the basis of the present scale running from 48 to 56 cents an hour. The agreement is subject to termination upon the giving of sixty days' notice by either party. The arbitration board appointed about a year ago to determine upon a scale of wages to be paid the trainmen of the company, for the year ended May 31, 1921, fixed a wage scale of 48 cents an hour for the first six months, 49 for the second six months, 50 for the third six months, and 56 cents an hour thereafter. This year the trainmen submitted to the company an agreement calling for a wage scale running from 54 to 60 cents an hour.

$500,000 to Aid Industry.—With the passage of the second deficiency bill by the Senate, the Department of Commerce is certain to receive the $500,000 asked by Secretary Hoover for the specific purpose of aiding industry. Of the amount, $250,000 will be expended in an effort to encourage foreign trade. The remainder will be utilized in various types of investigation and research looking to simplification, standardization and improvement in industrial practices and devices. The detailed plans for expending this money in the most effective way possible now are being worked out. As this is written, the bill still is in conference, but no great amount of difficulty is anticipated in harmonizing the differences between the bill as passed by the House and as it finally emerged from the Senate. That the President will sign the bill is a foregone conclusion.

New Franchise Urged in Houston.—Luke C. Bradley, vice-president and general manager of the Houston (Tex.) Electric Company, has notified Mayor Oscar F. Holcombe and members of the City Council that his company is ready to open negotiations with the City Council looking to the granting of a new railway franchise. The company has been operating under a temporary arrangement since it won its fight in Federal court for an increased fare. Negotiations opened several times since the company's victory in court have resulted in a deadlock each time, and the company has continued to operate under the court's order. Mayor Holcombe and members of the City Council have declared that any new franchise must include the expenditure of large sums for improvements, extensions and betterments. The fate of the jitneys in Houston also is a point that will be settled in the franchise negotiations.

Public Service Men Accept Cut.—The trainmen on the Public Service Railway of New Jersey, Newark, have voted to accept a reduction in wages of approximately 10 per cent. The new scale will be 46, 48 and 50 cents an hour, with 5 cents additional to operators of one-man cars. This is the scale fixed by the War Labor Board in 1919. The present rates are 50, 53 and 55 cents an hour. The company wanted to revert to the rates of 41, 43 and 45 cents an hour. A two-year agreement containing this scale was signed on June 22 by the joint conference board of the company and of the Amalgamated Association. The men had previously refused to accept a proposed reduction of 20 per cent. The new scale will go into effect on Aug. 1. Every employee of the company now a member of the Amalgamated Association will be bound by the terms of the new contract. New men will be taken on irrespective of any union affiliations.

Fate of Railway in Hands of City.—Unless the taxpayers of Brunswick, Ga., are in favor of buying the City & Suburban Street Railway, which operates in that city, and maintaining it as a going concern the threatened junking of the line will take place. The bondholders foreclosed their mortgage on the property recently. At a conference on May 11 between the Board of City Commissioners and representatives of the Board of Trade a proposal was made by the company that the lines be purchased and operated by the city government. In its statement the company suggests an extension of the line to Arco and expresses the belief that such extension would put the line on a paying basis if properly managed and operated. The property includes 8½ miles of track with the necessary wire, poles, etc., five motor cars and six trailers. It is believed that a questionnaire will be submitted to the voters in regard to the purchase of the line by the city government.

Programs of Meetings

Amalgamated Association of Street & Electric Railway Employees

The seventeenth convention of the Amalgamated Association of Street & Electric Railway Employees of America will be held on Sept. 12 at Auditorium-Armory, Atlanta, Ga. The headquarters will be at the Ansley Hotel.

Society for the Promotion of Engineering Education

The Twenty-Ninth Annual Meeting of the Society for the Promotion of Engineering Education will be held at Yale University June 28-July 1, 1921. The meetings will be held in college buildings, at the Lawn Club and at the Country Club.

Financial and Corporate

Wheeling Roads Sold

Controlling Interest in City Railway and Affiliated Lines Secured by Providence Bankers

Sartorius & Company, Providence, R. I., have purchased a controlling interest in the West Virginia Utilities Company, which controls the Wheeling Public Service Company and the City Railway. The management of these properties has for some time been under the direction of the W. S. Barstow Management Corporation, which has been represented locally by J. D. Whittemore. At a recent meeting of the board of directors it was determined to continue the present management for the time being. The directors instructed Mr. Whittemore to co-operate in every way with M. R. Stern, the engineer representing Sartorius & Company.

Mr. Stern is now manager for Sartorius & Company at Chattanooga, Tenn., for the Public Light & Power Company. He expects to divide his time between Wheeling and Morgantown. In commenting on the situation in Wheeling Mr. Stern said:

> The situation in Wheeling presents a number of perplexing problems. I can't say now, off hand, what will finally be done in respect to some of these difficulties, but the new owners of the Wheeling properties are going to do everything in their power to keep these roads going. The competition of the bus lines makes the difficulties of the railways greater.
>
> It would be very unfortunate, indeed, for the residents of that fine section Out-the-Pike and on through your fine valley to West Alexander if it should become impossible to operate the road longer.

According to Mr. Stern the new owners of these roads would like to see the properties held intact, but with the problems confronting the roads, their future is rather uncertain. The proposal to abandon operation of the City Railway will be dropped for the present, although the change in ownership does not necessarily change the status of that problem. Mr. Stern said further that as regards Wheeling, no change in the rates of fare or in the operation methods is contemplated.

Large Budget for M. O. Construction

According to the Detroit *Free Press* $1,000,000 will be added this year to the upkeep of the Department of Public Works for the construction of the municipal railway in Detroit. This is another example of expenditure not charged to the railway property on account of municipal operation. In various sections of the city repaving and resurfacing have been undertaken in this construction. To meet the cost of this resurfacing Mayor Couzens requested the Council to add another $1,000,000 to the budget. No part of the money will be taken from the $15,000,000 voted by the people for a municipal railway system. The *Free Press* says:

> The department of public works is not the only department of the city which was forced to add to its budget in order to shoulder part of the expense of the municipal operation system. The public lighting department, the water board and the forestry department have all been called upon to make large expenditures in order that work on municipally operated lines should not all be charged against the $15,000,000 appropriation.

The commission and the Mayor have announced that the new lines are being constructed more cheaply than railway lines ever were constructed in any other American city. The actual cost to the street railway commission is about $62,000 per mile, according to Ross Schram, the secretary.

Municipal Railway Bonds Taken

A new syndicate, composed of the Guaranty Company, the National City Company, Bankers' Trust Company, Harris, Forbes & Company, Eastman, Dillon & Company, E. H. Rollins & Sons, all of New York, and Keane, Higbie & Company and the Detroit Trust Company, of Detroit, has purchased of the city of Detroit $2,000,000 bonds; $1,000,000 of 5½s, due May, 1949, and $1,000,000 of 6s, due June, 1947. The syndicate has also taken over the small remaining balance of bonds in the previous syndicate and is offering the 6 per cent bonds, maturing in various amounts from 1927 to 1951, on a 5.60 basis, and the 5½ per cent bonds, maturing from 1931 to 1948, at par.

The $2,000,000 city of Detroit 5½s and 6s are issued by the city for street railway purposes, and are the bonds recently validated by the Supreme Court of the State of Michigan. The decision of the court handed down on June 6 referred to a similar suit in the Federal courts, in which, upon appeal, the Supreme Court of the United States held that the proceedings to authorize the municipal railway to issue bonds were regularly taken. The Michigan Supreme Court also went on to uphold the validity of the special election held by the city on April 5, 1920, at which the voters by a very decided majority authorized the bond issue and municipal street railway program, and upheld the power of the city to issue the bonds, assume the obligation and to "convert money raised by taxation to the construction of its street railway system."

The bankers explain that this action of the court effectually disposes of any question as to the validity of the bonds and establishes their investment position.

Dividends Paid in Scrip

Holding Company with Large Oil Interests Conserving Its Resources —Shares Sell Down

Dividends of the Cities Service Company, New York, N. Y., are for the present to be paid in scrip instead of cash. This decision was made by the directors on June 15. No maturity date has been set for the scrip. Moreover, the scrip does not bear interest. In case of stockholders forced to sell their scrip, it is said that Henry L. Doherty, fiscal agents for the Cities Service Company, have planned a syndicate to take over the scrip at the market. The company has outstanding with the public more than $77,000,000 of cumulative preferred stock, more than $3,000,000 of ordinary preferred stock and $45,000,000 of common stock. In addition there are close to $30,000,000 of debentures outstanding.

MOST EARNINGS FROM OIL

While the company controls electric and railway properties, its principal source of income is derived from its oil holdings and leases. The gross earnings for 1920 were $118,000,000, the net after preferred dividends were paid being more than $18,000,000.

A statement by the Cities Service Company to stockholders gives at length the memorandum submitted by H. L. Doherty, president of the company, to the directors. He said that his recommendation for the suspension of the dividends had been reached after numerous conferences with the most notable oil men. Nearly all agreed that the present excessive production of oil over the demand could not last long, and that a period of shortage was in prospect. He said that by the decisive action at this time in suspending the dividends the directors would be able greatly to increase the value of the company's assets, resume cash and stock dividends at an early date, with the payment of all scrip issued for dividends, and be able again "to reward our stockholders in a handsome way for having accepted a change from our present dividend policy to one wherein we will issue only scrip."

The effect of this action on the stock was greatly to depress all the various issues, although they necessarily suffered in the general decline which has recently been in evidence. Cities Service common has sold down to about 130 from a high of 259 last year.

Commission Approves Sale.—The Public Utility Commission of New Jersey has approved the application of the Five-Mile Beach Electric Railway, Wildwood, N. J., for the sale of a plot of land in Wildwood, N. J., for a consideration of $7,500. Approval was also granted for the abandonment of tracks on what is known as the loop at Wildwood Crest. Need for the loop has disappeared since the introduction of double tracking, it was testified.

Answers to Accounting Questions

Another Series of Questions and Tentative Answers Under the Uniform System of Accounts for Electric Railways

Another series of tentative answers to questions raised in connection with the uniform system of accounts, prescribed by the Interstate Commerce Commission, has just been issued. As these answers have not received the formal approval of the commission, however, it should be understood that the decisions do not represent its final conclusions and that they are subject to such revision as may be thought proper before final promulgation in the accounting bulletins of the commission.

THE case numbers covered below are from A-602, b to A-614, with certain omissions. Another installment will follow. The omitted numbers represent cases which either are not of sufficient importance to justify publication or involve questions upon which a definite conclusion has not been reached.

Q. (*A*-602, b). What is the correct accounting for the cost and maintenance of smokestacks erected at power houses?

A. The cost of smokestacks which are not permanent as to position but are attached to and are part of the boilers shall be charged to account 542, "Power plant equipment." If they are permanent in position and will remain as part of the building structure in case the other equipment is removed, account 539, "Power plant buildings," shall be debited. Maintenance shall in each case be charged accordingly.

Q. (*A*-603). Paving assessments are paid in installments, each payment covering one installment and the interest due on the deferred payment. What is the proper accounting?

A. If the cost of property assessed is carried in account 401, "Road and equipment," the proportion representing the principal of the assessment shall be debited to account 511, "Paving," or to account 10, "Paving," depending on whether the assessment is for installation of new paving or the improvement of old paving, or for pavement maintenance. If the cost of the property assessed is carried in account 404, "Miscellaneous physical property," the proportion representing the principal of the assessment, if for new paving, or the improvement of old paving, shall be debited to account 404, and if for pavement maintenance, to an account includible under accounts 205, "Net income from miscellaneous physical property," or 219, "Net loss on miscellaneous physical property," as may be appropriate. The proportion of each payment which represents interest shall be charged to account 221, "Interest on unfunded debt." (See Case 267, Accounting Billetin 14.)

Q. (*A*-604). To what account should be charged the pay of employees engaged in directing or overseeing "safety-first" and "prevention of accidents" work?

A. The pay of such employees shall be charged to accounts 1, "Superintendence of way and structures," 29, "Superintendence of equipment," 45, "Superintendence of power," or 63, "Superintendence of transportation," depending on the class of work upon which they are principally engaged, except that the pay of employees or others engaged exclusively in the general promotion of "safety-first" methods among the public shall be charged to account 89, "Miscellaneous general expenses."

Q. (*A*-605). To what account should be charged the cost of loading, hauling, and unloading steam locomotive cinders accumulated at cinder pits and other places near shops?

A. The cost of loading shall be charged to account 75, "Operation of steam locomotives." The cost of hauling and unloading shall be charged to the appropriate maintenance, road or other account depending on the use made of them. If cinders are not used for any purpose the entire cost of removal shall be charged to account 75. (See Cases 166 and 289, Accounting Bulletin 14.)

Q. (*A*-606). To what account should be charged:

(a) The pay of cashiers at elevated and subway stations.

(b) The pay of chief cashier and assistants engaged in supervising the station cashiers.

A. (a) Pay of station cashiers is chargeable to account 68, "Station employees."

(b) Pay of chief cashier, if he is considered a general officer, is chargeable to account 83, "Salaries and expenses of general officers." If chief cashier is employed in the general office but is not considered a general officer, his pay is chargeable to account 84, "Salaries and expenses of general office clerks," as is also the pay of his clerical assistants.

Q. (*A*-607). What account should be charged with the cost of rebuilding a work car wrecked while it was being used for converting a trestle to an embankment?

A. If the wreck was directly attributed to work the cost of which is chargeable to account 504, "Grading," car repair costs shall be assigned to the same account, but if attributable to work chargeable as maintenance or was caused by transportation operations, repairs shall be charged to account 32, "Service equipment."

Q. (*A*-608). A carrier pays a power company a fixed rate per kilowatt hour for power used, and, in addition, a percentage of the cost of a transmission line built and maintained by the power company to serve the carrier. How should the payments be charged?

A. Assuming that the ownership of the transmission line remains with the power company, the entire amount paid by the carrier shall be debited to account 59, "Power purchased."

Q. (*A*-610). A carrier installs a spur track in a street not previously occupied by tracks. How should it account for the cost of removing pavement preliminary to track construction, and the cost of replacing pavement after track construction?

A. The cost of removing paving shall be charged to account 504, "Grading," and the cost of the new paving to account 511, "Paving."

Q. (*A*-611) When a carrier sets up a depreciation reserve on way and structures, should it base its depreciation charges solely on the amounts in accounts representing specific property, such as account 506, "Ties," and 511, "Paving," or on amounts in all accounts for way and structures?

A. As the charges to operating expenses should represent the actual current loss from depreciation, they shall be based on the accounts which include depreciable property. It is required that the records shall be such that the depreciation accrued with respect to any particular unit of property may be readily determined and cleared from the reserve at the time such unit is withdrawn from service.

Q. (*A*-612) A carrier receives rental from property used by another carrier, the payment covering factors of rent, maintenance, and operation. Should the entire amount be credited to revenue account 115, "Rent of tracks and facilities," in accordance with the text of that account, or should that portion representing the cost of maintenance and operation be credited to primany operating expense accounts as indicated in Cases 332 and 403 of Accounting Bulletin 14?

A. Where the payment is for rent of tracks, terminals, or bridges which are jointly used the full amount shall be credited to the appropriate rent accourt regardless of the basis used in determining the amount of the payment, but where the payment covers only a proportion of the cost of maintenance and operation of property which is jointly used and there is no element of rent involved, the amount shall be credited to the appropriate primary maintenance and transportation expense accounts.

Q. (*A*-613) To what account should be charged cost of publishing notices of fare increases, such publications being prescribed by city ordinance?

A. To account 80, "Advertising."

Q. (*A*-614) A carrier has established a department, under the care of a superintendent, for the operation of non-revenue equipment. How should the department expense be distributed?

A. The pay and traveling expenses of the superintendent shall be charged to account 83, "Salaries and expenses of general officers," and the other general expenses to account 84, "Salaries and expenses of general office clerks," 85, "General office supplies and expenses," and to account 94, "Stationery and printing," as may be appropriate.

Belgian Light Railways Being Rehabilitated

The report of the National Light Railway of Belgium (Société Nationale des Chemins de Fer Vicinaux) shows that the destruction of track caused during the German invasion is rapidly being repaired. During the past year 647 km. of track which had been demolished was again made ready for service and on Dec. 31, 1920, 3,388 km. was in operation. About 600 km. of track remained to be rehabilitated. During 1920 the company purchased 71,000 (metric) tons of rails and 1,897,645 ties. The Germans took from the property 427 steam locomotives, 14 electric motor cars, and 116 electric trail cars, but the greater part of this material has been recovered. The motive power used is both steam and electric, divided as follows:

Steam power on.............	3,852.11 km.
Electric power on............	359.29 km.
Mixed service of steam and electric	84.45 km.
Total of lines opened for public service	4,295.85 km.

The extent of track on which electric cars are used, measured in miles, is 225. The service given throughout the system is a light railway service and some city tramway lines are included in the system. Altogether in its electrical equipment the company has 568 electric motor cars, nine gasoline-electric motor cars, 286 closed electric trailers, and 246 open electric trailers. At the end of the year sixty-nine electric motor cars were under order. The receipts during 1920 from all sources were Fr. 66,934,551, and the expenses Fr. 65,246,002.

Change Suggested in Mexican Financial Plans

A report of the London committee on the financial situation of Mexican Light & Power and the Mexican Tramways group of companies announces an issue of $12,000,000 of 6 per cent debentures.

No interest has been paid on the various issues of bonds and on funded debts for over six years, and the aggregate of funds now available falls far short of the amount required to discharge the interest, quite apart from the principal of the unfunded debts, which are long overdue. The aggregate debt of the associated companies, as at the end of December last, was more than $8,897,000. No dividend has been paid since November, 1913, on the $6,000,000 of preference shares of the Light & Power company. The report says that the default of the associated companies is a direct consequence of the conditions prevailing in Mexico since 1911.

An outline of the provisional agreement gives in considerable detail plans for payment of a number of coupons forthwith, further payments by the end of June, 1922, and others a year later, but sinking fund payments to be resumed in 1928 with all payments to that date to be waived. Bondholders are urged to accept the proposed plans as "being the best arrangement that can be effected in their interests."

The report says that although the position in Mexico remains difficult, the outlook is certainly more hopeful than it was.

Interurban Dissolution Petition Presented

A petition for the dissolution of the Ohio Electric Railway system was filed in the Federal Court at Toledo, Ohio, during the week ended June 18 by Receiver B. J. Jones, Columbus, who asks permission to surrender the leases of several of the subsidiary lines in the system.

The receiver alleges in the petition that the Indiana, Columbus & Eastern Traction Company, the Columbus, Newark & Zanesville Traction Company, and the Fort Wayne, Van Wert & Lima Traction Company, do not collect enough revenue now to pay the rental required of the Ohio Electric Railway.

The Ohio Electric wants allowance in stock for the cars used on these lines which it has purchased during its operation of the lines.

Mr. Jones says he believes he can make the Ohio Electric itself pay its way if it is released from the burdens of the other lines.

Judge John M. Killits has not made an order in the case.

Financial News Notes

Georgia Property to Be Sold.—The property and equipment of the City & Suburban Railway, Brunswick, Ga., will be sold on July 5 as a going concern. If a satisfactory bid is not received it is likely that the property will be sold as junk.

Traffic Decreases in Cincinnati.—Higher fares and industrial conditions in general have greatly affected the traffic handled by the Cincinnati (Ohio) Traction Company. During the month of May, 1921, there was a daily decrease of 39,963 passengers compared with May a year ago. The total decrease in revenue passengers for the month was 1,238,900.

Wants to Abandon Service.—The Union Railway, New York, N. Y., has applied to the Transit Commission for permission to abandon service on Jerome Avenue, Bronx. S. W. Huff, president of the company, said in the petition that the receipts of the property do not warrant continued operation; that the opening of the elevated part of the Lexington Avenue rapid transit line on Jerome Avenue had taken most of the traffic in that direction. A public hearing on the abandonment will be held on July 21.

$10,000,000 for Purchase and Improvements.—Civic Finance Commissioner Ross of Toronto, Ont., has been authorized by a by-law passed by the City Council to issue debentures for $10,000,000. The Transportation Commission, which is preparing for the city to take over the Toronto Railway on Sept. 1, asked for $7,000,000 and part of the balance of the $10,000,000 will be used in the rehabilitation and operation of the system. In asking the Council for this amount, Commissioner Ross said he proposed to cancel some $2,026,000 of the issue authorized last February.

More Eastern Massachusetts Lines to Stop.—The Mayor of Woburn, Mass., and the Selectmen of Burlington and Billerica were notified on June 4 by Homer Loring, chairman of the trustees of the Eastern Massachusetts Street Railway, that the Woburn-Billerica line would be posted on June 6, for discontinuance, to be effective on and after June 13. The company says it is compelled to take this action because of the failure of those three communities to take the necessary steps to eliminate jitney competition. The proposed change will cut off all connection between Woburn and Lowell and intermediate places.

Stockholders Not Liable. — Stockholders of the Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio, are not liable to assessment in the suit by Dwight S. Marfield, according to an opinion handed down by Judge Stanley C. Roettinger in the Hamilton County Common Pleas Court, Cincinnati. The suit sought to hold all stockholders of the company and named more defendants than any other action ever filed in the local courts. That there was no contractual relation that would put this case within the provisions of the Federal constitution, Judge Roettinger said was the basis of his decision. Dwight Marfield, representing creditors of the company, sought in the suit to make former stockholders liable for $500,000 of debts.

Defers Dividend Payment. — The board of directors of the Indianapolis (Ind.) Street Railway at a recent meeting voted to defer the payment of the usual quarterly dividend on the preferred stock of the company, due on June 1. Dr. Henry Jameson, president of the board, explained that the directors felt that "the condition of the company is such that payment of this dividend should be passed." The dividend due on June 1 was 1½ per cent on $5,000,000 of preferred stock, totaling $75,000. This is the first time the company has passed a dividend on this stock, Dr. Jameson said. Payment of dividends on certain stock of the company was waived in the reorganization of the Indianapolis Street Railway and the Indianapolis Traction & Terminal Company on the order of the Public Service Commission in 1919.

Traffic and Transportation

Ottumwa Case Unusual

Two Years of Litigation Over the Matter of Fares Leaves Railway Where It Started

The net result of the litigation between the Ottumwa Railway & Light Company, Ottumwa, Iowa, and the city over the matter of fares is that the company finds itself under the recent decision of the Supreme Court of Iowa about where it started a little more than two years ago. This decision was referred to in the ELECTRIC RAILWAY JOURNAL for April 16, page 751.

The following summary is from a statement prepared by Cummins, Roemer & Flynn, attorneys, Chicago.

By a provision in its franchise the Ottumwa Railway & Light Company was limited to a maximum rate of 5 cents for street railway fares. In December, 1918, the City Council passed a resolution authorizing the increase of the fare until after the signing of the treaty of peace with Germany, the new rate to be 6 cents. This rate was put into effect, but about April 1, 1919, the City Council rescinded the resolution and attempted to prohibit the company from charging more than 5 cents.

Thereupon suit was brought. A temporary injunction was granted by the trial court which upon motion of the city was dissolved. From the order dissolving the temporary injunction the company appealed to the Supreme Court, where the question discussed was the validity of the franchise limitation of fare in the first instance, it being the contention of the company that the Legislature had never delegated to the city the state function of fixing rates and that therefore the franchise contract limiting the fare to 5 cents was void for want of power in the city to make it. The Supreme Court of Iowa held against this contention in an opinion dated July 10, 1919.

Following this ruling the company filed a petition for a rehearing. This rehearing was granted. After reargument and resubmission of the case a second opinion was handed down on Aug. 9, 1920, in which the contention of the company was upheld that the city was without authority under the statute to make a rate by contract with the railway and that the contract in that regard was void.

Both opinions upheld the broad principle that a city could not contract for rates of a public utility unless its authority so to do had been expressly conferred by the State Legislature, the fixing of rates being a matter of state control, but in the former opinion by a unique theory the judge who wrote the opinion read into the statute the authority demanded by the general principle laid down. In doing this he overlooked a governing decision by the court and hence the same judge wrote the second opinion above referred to.

When the second opinion was handed down the company naturally concluded that the litigation was ended. The city, however, through its counsel filed a petition for rehearing. This rehearing was granted by the court and the case was set down for argument the third time in April, 1921. In the meantime the personnel of the Iowa court had changed considerably as a result of the election in the fall and the death of one of its members. Before the time came for submission the company asked leave to dismiss the appeal. This was granted by the court with a memorandum to the effect that both the opinions rendered in the case and above referred to were withdrawn.

With a view to determining what would be the proper fare since the reduction in wages, a statement has been prepared by accountants for the city which shows that from June 9, 1920, to March 31, 1921, 28 per cent of rendered in the case were withdrawn.

Omaha Company Wants Skip Stops Continued

The "skip-stop" system, which has been used at Omaha, Neb., since Oct. 1, 1918, was defended before the State Railway Commission in Omaha recently by R. A. Leussler, vice-president and general manager of the Omaha & Council Bluffs Street Railway. The hearing was in response to a petition from patrons who urged the commission to order the company to restore the old system of stopping at every intersection. Cars are stopped at every downtown intersection, and beyond this district the stopping points are indicated on poles by black lettering on a field of yellow.

Mr. Leussler testified that a test made for the year 1919 showed that the operating expenses were reduced $56,663 by reason of the skip stop, and of that amount $16,097 was a saving in coal expense. He told the commission that the new system yielded the equivalent of 13,444 additional car hours per year, and that the average speed of cars had been increased from 9.3 to 9.4 miles per hour. He estimated that it would cost $65,000 more this year to return to the old plan, with no appreciable enhancement of the service.

More rapid and comfortable service and the lessening of accidents were some of the arguments offered in favor of the skip stop. The commission will take the matter under advisement.

Ten-Cent Fare Refused

New Jersey Utility Commission Follows Precedent Established in Public Service Railway Ruling

Eight cents will be the fare in Trenton, N. J., on and after June 27. The present 1-cent transfers will be continued. This was the ruling made on June 20 by the State Board of Public Utility Commissioners on the application of the Trenton & Mercer County Traction Company for a 10-cent fare.

The board held that the present 7-cent rate was "insufficient and unreasonable," but it was not satisfied that a 10-cent rate was just and reasonable and refused to approve that rate.

The board estimated that the increased fare of 1 cent will give a return to the company of nearly 7 per cent on the highest estimate of the value of the company's property and approximately 8 per cent on the lowest estimate.

INCREASE FROM HIGHER FARE $185,000

The increased revenues under the new rate, the board calculated, will be approximately $195,000 additional, and deducting about $10,000 for the extra franchise tax which must be paid on the increased gross receipts, the total increase from the higher fare will be $185,000. This added to $158,000, the prospective net revenue of the company from the 7-cent fare, would total $343,000 the entire net income.

If a 10-cent fare should be charged and the number of passengers estimated by the company should be carried, the board pointed out, the return would be more than the company was fairly entitled to. On the other hand, however, if the result of such fare should materially curtail the use of the trolleys, the value of the service would be impaired and lessened to the public and the company might not obtain more revenue than would accrue under an 8-cent fare.

The Board of Public Utility Commissioners took into consideration not only the Ford, Bacon & Davis report, but also the valuation heretofore fixed by the board in its report of Dec. 13, 1915, and Dec. 26, 1919. The valuation in the latter appraisal was $3,918,011, including working capital of $100,000.

VARIOUS APPRAISALS CONSIDERED BY BOARD

The appraisal of 1915 totaled $4,254,657, while the Ford, Bacon & Davis appraisal based upon pre-war costs was $4,334,192. In addition there was a valuation of $4,875,000 made by J. G. White & Company in a former proceeding, in which war time prices were recognized. The Ford, Bacon & Davis report, the board said, however, expressed a conclusion, not based upon actual costs, that the value of the property taking into consideration pre-war prices, war prices and post-war prices, would be in the neighborhood of $5,000,000. The board stated that due consideration was given to all these appraisals.

Jitney Procedure Announced

New Jersey Commission Lays Down General Conditions Under Which It Will Grant Permits

The State Public Utilities Commission of New Jersey in a recent decision announces that jitney service is accepted by the board as a legislative authorized method of transportation, enjoying the same sanction of law with electric railways. In all future applications for licenses by jitney operators, the board announced it will proceed on the theory that the Legislature deemed jitney service proper in that it refused to curtail the use of such transportation and because it decided to give jitneys the authority and sanction of law in the same manner as any other system of transportation. The board held, however, that municipal licenses granted must have the approval of the commission before they are valid. Attempts to operate under municipal licenses, without the board's approval, are illegal. The Public Service Railway will probably appeal to the Supreme Court for a review of the decision.

The board's finding in part is as follows:

> There are, therefore, in many cities of the state two systems of street transportation: the electric railway and the jitney, recognized by and enjoying the equal sanction of the law. Indeed, if either system can be said to be favored by the Legislature it would seem to be the jitney because while the Legislature has placed all street railways under the jurisdiction of this board it has expressly refused to place jitneys licensed before March 15 of this year and operated over their April 6 routes, by limiting its power of regulation solely to such as should be licensed after March 15.

The board granted permission to C. A. Becker to operate a bus line on the Newark-West Orange line and at the same time refused to approve twenty-six applications for licenses granted by Hoboken to operate on Washington Street between Fourteenth and the Hudson and Manhattan Tube tunnel, a distance of approximately a mile. In denying the Hoboken license the board said:

> We are of the opinion the necessity does not require additional jitney service as the same will not add to the comfort and convenience of the riders, but on the contrary will add to the inconvenience of others who have to use the streets or cross the same.

There are 125 jitneys in operation on this Hoboken route.

The commission also announced that because the Atlantic Coast Electric Railway operating in Asbury Park and other seashore towns has recently materially improved its service it would issue no licenses for jitneys to run parallel with the trolley lines.

Bonus Plan for Trainmen Abandoned

The Dallas (Tex.) Railway has abandoned its plan of bonus pay for trainmen, as it did not prove satisfactory, according to Richard Meriwether, vice-president and general manager, who inaugurated the scheme as an inducement to careful operation. The scheme of reward provided that a monthly bonus of 2 cents an hour for all time worked was to be paid to motormen if they were free from any accident during the month. The conductor received a corresponding amount if his record was clear from any complaint arising out of his contact with the public.

The plan was installed early in 1920 and was continued during a large part of the year. It followed an earlier plan whereby the company divided any saving in the cost of accident claims under 4.5 per cent of the gross receipts, in the proportion of 75 per cent to the men and 25 per cent to the company. This reward was paid only at the end of the year and was distributed among the men according to the number of hours' work they had put in during the year. This did not prove to stimulate any great improvement in the number of accidents, and it was abandoned for the plan of monthly payment of a fixed amount, also abandoned.

Dallas Asks for Continuance of Six-Cent Rate

The Dallas (Tex.) Railway, having lost its fight for a 7-cent fare, has filed with the City Commission an application for a continuance of the 6-cent fare for another year. The 6-cent fare was granted on June 25, 1920, for a period of one year, with a proviso that if the company's finances were in such shape at the end of that period that it could not operate on a 5-cent fare and show earnings of 7 per cent as provided in the franchise, the 6-cent fare would be continued for another year at the request of the company. The City Commission is expected to approve the application before June 25 so that the company can continue on the 6-cent fare basis without interruption.

The application of the company for a continuance of the 6-cent fare represents that the company can not reduce fares to 5 cents at this time and continue to operate and maintain the present standard of service. It is set forth that the present 6-cent fare was granted by the City Commission as a relief measure during negotiations for a service-at-cost franchise, but that such negotiations were called off without material result having been obtained. The traction company then sought a 7-cent fare on the ground that a 7-cent fare charge was necessary in order that a return of 7 per cent on the agreed valuation might be shown. The application for a 7-cent fare was denied by the City Commission on May 2, 1921.

Richard Meriwether, vice-president and general manager, who signed the application of the traction company, declares that unless there is a further reduction in operating costs or unless the company is relieved of certain burdens now imposed on it by the city, such as bearing the cost of paving between its tracks, officials feel that they will not be able to keep pace with the growing requirements of Dallas. He says the company probably will continue to show its authorized return of 7 per cent but that it will not be able to rehabilitate its credit.

Fares to Be Reduced

Cincinnati, by Deferring Certain Franchise Payments, Will Benefit Almost Immediately

Amendments to the ordinance governing the operation of the Cincinnati (Ohio) Traction Company were passed during the week ended June 18 by the City Council, assuring the public of a decrease in fares on Aug. 1 and Nov. 1 of this year. The fares will be reduced one-half cent on each of the dates mentioned. The amendments were passed by twenty-seven votes to three.

The session of Council at which the amendments were adopted was marked by frequent squabbles arising over the proposed action of Council in passing the amended ordinance. Several Councilmen who voiced bitter opposition to the new plan at a public hearing several days prior again took the floor against the measure.

Before the amended ordinance was voted on, Saul Zielonka, City Solicitor, explained the workings of the ordinance, showing how the amendments will effect a great saving. After Mayor John Galvin signed the ordinance he issued a brief statement saying that he did so because he wanted fares to come down as soon as possible.

A letter of opposition to the new plan sent to the Council committee on street railways by the Chamber of Commerce was ordered received and filed.

William Jerome Kuertz, Director of Street Railways, said that the new ordinance would pave the way to lower fares with the help of a readjustment of economic conditions.

The ordinance is entitled as follows:

> To provide for the reduction of the cost of carrying passengers on the street railway system of Cincinnati by the suspension of certain payments and accruals provided to be made by Ordinance No. 253-1918 of the City of Cincinnati, and to provide a reduced rate of fare for school children in said city.

The amendments to the original service-at-cost grant have been explained by Mr. Kuertz. He says that the savings made through wage reductions, lower coal prices and the new power contract with the Union Gas & Electric Company in September would not be noticeable in reduced fares for several years under the present franchise. He pointed out that the Cincinnati Traction Company has been unable to pay its accumulated deficits and scarcely has earned enough for its capital charges. It was contended by him that the proposed ordinance provided a change which would permit the public to get the immediate benefits of present reductions in operating costs without suffering any loss of franchise tax, but merely deferring that obligation.

Line Resumed and Fare Cut.—The Revere Beach prepayment loop of the Eastern Massachusetts Street Railway, opposite the State Bath House, Boston, Mass., has been reopened for the summer season. The fare between Scollay Square and Revere Beach has been reduced from 15 to 10 cents on the Bay State lines by way of Chelsea.

Seven Cents Desired

Richmond Railway Wants This Rate Pending Permanent Franchise Settlement

In support of the request of the Virginia Railway & Power Company for an increased fare in Richmond from 6 to 7 cents, President Thomas S. Wheelwright has given to the business organizations of the city a statement of the company's affairs showing that there are held by Richmond people 22,284 of the 85,000 shares of preferred stock, or more than 26 per cent, and 35,099 shares of the 120,000 shares of common stock, or 29 per cent.

The historic value of the Richmond street railway property made by Stone & Webster, that is to say, money actually invested, plus interest, less any returns paid to investors in the past 25 years, amounts to	$20,249,400
The present value of the Richmond street railway property now in the service of the public, according to the inventory and appraisal of Stone & Webster, is	12,488,841
Showing an actual shrinkage in value of	$7,760,559

The securities allotted to the Richmond street railways on the basis of its present value are as follows:

Bonds	$6,725,366
Preferred stock	2,671,800
Common stock	3,317,708
Total	$12,714,874

The interest on these bonds at 5 per cent and 1 per cent sinking fund amount to	$403,522
Under the 6-cent fare the company contends it is now earning only 1.3 per cent, or at the rate of	86,959
Leaving a deficit on account of bond interest of	$316,563

In his statement, Mr. Wheelwright says:

> We estimate that allowing for the actual falling-off in travel we will haul about 40,000,000 revenue passengers under the 7-cent fare which would give a gross increase in revenue of $400,000, 10 per cent of which will have to be paid to the city as a franchise or license tax, leaving an estimated balance of $360,000, from which will have to be deducted the difference between the 7-cent fare and school ticket fares at 2½ cents, which, based on last year's figures, will amount to $45,000, leaving a net estimated balance of $315,000.
>
> Hence you will see that if the 7-cent fare is granted it is only an emergency measure pending the working out of a franchise which will recognize the value of the property used in the railway service and fix such fares from time to time as will insure the integrity of the investment, thereby securing a basis for credit upon which further capital investment may be obtained.

Bus Measure Upheld

The constitutionality of Toledo's bus regulatory ordinance has been upheld by Common Pleas Judge Curtice Johnson following arguments by bus owners and the city attorneys.

The temporary injunction against the enforcement of the ordinance will stand for a few days, however, to allow an appeal to be taken before the County Appelate Court. It is believed that this appeal will be heard soon so that the ordinance may be enforced if upheld.

William Powlesland, bus owner, who brought the suit against the city, claims that the bonds required make operation of buses prohibitive. At law it was claimed that the ordinance was invalid because it contained more than one subject matter.

"The ordinance, I find," declared Judge Johnson, "contains but one subject matter, that of the regulation of buses."

It is said that the buses have been taking away approximately $700 a day from the railway by operating on the best paying lines at peak hours and for short hauls only.

Stage Lines Cannot Give Local Service

Operative rights of automobile transportation companies engaged in business before the regulatory statute of May, 1917, are announced in a decision by the California State Railroad Commission of June 10, 1921.

The commission holds the right of regulation rests in the commission, and extensions of service are subject to permit. This applies particularly to the inauguration of local service. This decision was rendered in the case of the Crown Stages Company against the White bus line and the White stage line. In this case the commission ordered the White bus line and the White stage line to desist operating as a transportation company between Santa Ana and Anaheim and intermediate points. The defendant companies hold an operative right for a through service between Los Angeles and San Diego, and because of this claimed the right to operate a local service between Santa Ana and Anaheim, which are way points, without obtaining from the commission a certificate of public convenience.

The commission holds that, notwithstanding the defendant companies were operating before the statute of 1917, they are subject to regulation by the commission. The decision says:

> The only basis for any distinction between transportation companies operating prior to May 1, 1917, and those which commenced subsequent to that time is in the manner of creation of their operative rights.

The commission in its decision points out and holds that the act in effect declared that such operations as were actually being carried on in good faith on May 1, 1917, would be recognized as a lawful right to be exercised by those then in enjoyment. Every subsequent deviation from or change in such operations must be under the approval and authorization of the regulatory body.

The decision also lays down the rule that a company would have the right to put on local service to the extent only that it was its duty to render it as the company had held itself out to do prior to May 1, 1917.

This ruling will affect a number of companies operating under rights acquired before May 1, 1917. The commission holds that all companies originally operating between through points must obtain a certificate of public convenience and necessity in order to initiate local service.

Transportation News Notes

Fares Must Go Up in Findlay.—The fare at Findlay, Ohio, will be increased to 10 cents beginning July 1. The lines there are operated by the Toledo, Bowling Green & Southern Traction Company, under the service-at-cost plan and have been showing a deficit under an 8-cent fare. Riding has shown a decrease each month since the plan was adopted.

Lower Fares in Effect.—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., has announced a new fare schedule whereby thirteen tickets will be sold for $1, heretofore restricted to workingmen. It is believed that the lower rates will increase the patronage which decreased after September, 1920, when the 10-cent rate went into effect. This 10-cent rate remains in force for cash fares. The lower rate will be an experiment, the company reserving the right to revoke the order if operation under it is found to be unprofitable.

Jitneys Ruled Off Flint Streets.—In order to eliminate traffic congestion on streets where cars are operated the Flint City Council recently ruled jitneys off streets on car line routes. The ordinance provides that bus operators will have to file with the city clerk a statement on the proposed route, terminals and hours of operation. Approbation of the council will be necessary before jitneys can run. Recently the Flint City Council authorized a 6-cent rate after the Detroit United Railway which operates in Flint had asked for a fare readjustment and the elimination of bus competition.

New Rates Filed.—The Pacific Power & Light Company, Astoria, Ore., has filed a new tariff with the Oregon Public Service Commission providing increased fares on the traction lines of the corporation, together with slightly advanced charges for gas. Under a new law enacted at the last legislature, tariffs of this character have to be filed with the public service commission 30 days before becoming effective. If not suspended by the commission before the end of the 30-day period, the rates become operative without a hearing or other formality. For single rides up to the length of the line in either direction, the company has asked that the cash fare be increased from 5 to 7 cents. Ticket books, good for 50 rides up to the length of the lines in either direction have been fixed at $3, while student ticket books, good for 40 rides up to the length of the lines in either direction have been set out in the tariff at $1.75. This is an increase from $2.50 for five-ride ticket books, and $1.50 for student ticket books.

Personal Mention

New Officers for Southern Public Utilities Company

D. G. Calder, manager of the Charlotte branch of the Southern Public Utilities Company, has been selected treasurer to fill the vacancy caused by the election of E. C. Marshall as president to succeed Z. V. Taylor. A. B. Skelding, of utility fame, now steps into the managership of the property.

Mr. Calder is well equipped to fill his new position, having gained much experience since assuming the managership when the company was formed some years ago. Prior to his services with the Southern Public Utilities he was connected with the Catawba Power Company.

A. B. Skelding, the new manager of the Charlotte branch, is one of the best known utility men in the South. For the past three years he has been assistant to the president of the Carolina Shipyard. For many years prior to his association with the shipyard he was general manager of the Tidewater Power Company. His record of service includes experimental work with Thomas A. Edison and managing railway systems at Knoxville, Tenn.

Life Sketch of "Sam" Riddle

A brief review of the business life of Samuel Riddle and his connections with the Louisville (Ky.) Railway was recently published by a local paper, along with a silhouette of the man. It was said that during the time that Mr. Riddle has been with the railway he has been in practically every department in an executive capacity.

Commission Man Heads Engineers

Harry O. Garman, Indianapolis, Ind., has been elected president of the American Association of Engineers at its annual meeting in Buffalo. The organization has more than 25,000 members. Mr. Garman, who was first vice-president of the association, was nominated by the Indianapolis chapter. He is chief engineer for the Indiana Public Service Commission, with which organization, together with its predecessor, the State Railroad Commission, he has been associated for more than thirteen years. He is a past-president of the Indiana Engineering Society, member of the American Railway Engineering Society, associate member of the American Society of Civil Engineers and associate member of the American Institute of Electrical Engineers. For ten years he was an instructor and associate professor of civil engineering at Purdue University. He formerly was assistant engineer of the Illinois Central Railroad, and is a director of the City Trust Company, Indianapolis.

New Twin City Vice-President

T. Julian McGill, Westinghouse Man at Chicago, Enters Railway Operating Work

T. Julian McGill has been elected by the board of directors of the Twin City Rapid Transit Company, Minneapolis, Minn., vice-president of that company and underlying companies. Mr. McGill will move to Minneapolis within the next sixty days and will take up actively his duties as vice-president in charge of operation of the Twin City lines.

T. J. McGILL

Mr. McGill is at present manager of the Westinghouse Company's largest distributing plant in Chicago. He is well known throughout the entire West, more particularly in Minnesota, where from 1903 to 1909 he was manager of the Minneapolis office of the Westinghouse Company, having charge of all the Northwestern States including Montana and a large part of Canada. He has been connected with the Westinghouse Company since 1898. In 1909 he was transferred to Atlanta and in 1914 was made manager for the company in Chicago with jurisdiction previously noted.

It is expected that as vice-president in charge of operation Mr. McGill will take over a large part of the work connected with that department which has previously devolved upon Horace Lowry as president of the company.

The Twin City System is one of the largest of its kind in the country with a wide diversity of interests, its activities even including the operation of steamboat service on Lake Minnetonka. In the system are included 452 miles of line.

Managers and Superintendents Reassigned by Eastern Massachusetts Company

Transfers of managers on the Eastern Massachusetts Street Railway have been ordered by R. B. Stearns, vice-president and general manager, effective on July 6. The changes were brought about as a result of the death of Manager James O. Ellis of the Chelsea District and the resignation of Manager Harrah K. Bennett of the Melrose-Woburn District. They are as follows:

Manager Frank I. Hardy of Salem to manager of Chelsea and Melrose-Woburn Districts.

Superintendent Vard B. Leavitt of Lowell to superintendent of Melrose-Woburn District.

Manager Maurice E. McCormick of Quincy to manager of Salem District.

Charles E. Whalen of Boston Office to superintendent of Lowell District.

Manager Garfield S. Chase of Haverhill to manager of Lawrence District.

Superintendent Francis J. O'Donoghue of Brockton to manager of Haverhill District.

Manager John H. Hayes of Lawrence to manager of Quincy District.

Manager Patrick F. Sheehan of Brockton to manager of Fall River District.

Manager A. J. Boardman of Fall River to manager of Brockton District.

Mr. Devlin's Successor Appointed

Harvey W. Brundige on May 10 took office as president of the California State Railroad Commission, following his election to succeed Frank R. Devlin, who resigned from the commission May 1. Mr. Brundige was appointed to the State Railroad Commission two years ago for a six-year term by Governor William D. Stephens.

During his residence in southern California he has been prominent both in civic affairs and in matters of state importance. He has a national reputation in newspaper circles, having worked for several years in the East before going to California. He formerly was editor of the Los Angeles *Evening Express*. By reason of his experience in commission affairs he is said to be unusually well fitted for the office of president.

The membership of the railroad commission is now composed of H. W. Brundige, Los Angeles; H. D. Loveland, San Francisco; Chester H. Rowell, Fresno; Irving Martin, Stockton, and H. Stanley Benedict, Los Angeles.

Jess Marple, former superintendent of the Moundsville division of the Wheeling (W. Va.) Traction Company, has resumed his old duties after working for some time in Pittsburgh. William A. Smith, who has been acting superintendent of the Moundsville division, has returned to his duties as night dispatcher at Tenth and Main Streets. William Meyers, who has been acting dispatcher, has resumed his duties as trainman.

Clarence J. Shearn, Ex-Supreme Court Justice, has been appointed special counsel to assist the New York Transit Commission. Mr. Shearn, experienced in municipal and railroad law, will guide the commission in outlining a new plan for transit reorganization.

Ivan Bowen, Mankato, Minn., has been appointed by Governor J. A. O. Preus to the Minnesota Railroad & Warehouse Commission to succeed the late Judge Ira B. Mills. Thus Mr. Bowen becomes a commissioner at the beginning of the action by the electric railways of the State to have valuations of their properties made on which the commission is to base its order for rates which the various companies may charge for fares.

Howard T. Kingsbury, attorney in New York City, has been appointed counsel to the Transit Commission, in place of Louis C. White, who has resigned to enter private practice. Mr. Kingsbury was formerly a special assistant to the United States attorney-general in the prosecution of anti-trust cases in 1914. He is a graduate of Yale University and New York Law School and at present is judge advocate general of the New York State Guard, with the rank of lieutenant-colonel.

W. R. Williams, secretary of the California Railroad Commission's office at San Francisco, resigned on May 11 to become examiner for the commission and the head of the Los Angeles office. He will be succeeded as secretary by Colonel H. G. Mathewson, commander of the 40th Railroad Artillery Regiment in the World War, former commander of the American Legion in California and at present assistant secretary of the commission. Mr. Williams succeeds as head of the commission's office in Los Angeles Miss Converse, whose resignation was noted in the issue of this paper for May 7.

R. E. Luellen, safety engineer, Union Traction Company of Indiana, Anderson, Ind., has been appointed chairman of the bulletin committee, electric railway section of the National Safety Council. This committee is charged with the work of collecting data from the member companies from which to prepare the weekly bulletins distributed by the council. Mr. Luellen is editor of the magazine *Safety* published by the Union Traction Company of Indiana and is in charge of the company's power saving department, which is engaged in a very successful campaign of investigating and reducing the power consumption of its cars.

Frank M. Kemp, who has been connected with the general offices of the Gary (Ind.) Street Railway since March, 1912, and who has been chief clerk for the last five or six years, was appointed on May 22 as treasurer of the company, and also of the Gary and Valparaiso Railway, to succeed the late Lewis E. Woodward. Mr. Kemp, in addition to his duties as treasurer of both traction companies, will discharge the duties of chief clerk until the latter position shall have been filled by appointment. The Gary Street Railway and the Gary and Valparaiso interurban system are operated by the same management, and for that reason Mr. Kemp became treasurer of both systems. The appointment was made today by President Charles W. Chase, who is president of both companies.

F. J. Foote Advanced

Experienced Master Mechanic Now Superintendent of Power on Ohio Electric

F. J. Foote who for the past twelve years has been connected with the Ohio Electric Railway, Cincinnati, Ohio, as master mechanic in charge of car equipment and shops, has been promoted to the position of superintendent of power. He has been given, in addition to his former duties, the supervision of the power houses and substations on those properties of the system known as the Indianapolis, Columbus & Eastern Traction Company and the Columbus, Newark & Zanesville Traction Company. This includes two large power houses and fourteen substations.

F. J. FOOTE

Mr. Foote is well qualified for the position of superintendent of power, being a graduate of the University of Illinois and a post graduate of the University of Wisconsin, where he received the degree of electrical engineer in 1902. He has also had wide experience in power station work, having held the position of electrical engineer on heavy construction work for both the Allis-Chalmers Company and the Westinghouse Electric & Manufacturing Company and was also for several years chief operating engineer for a large manufacturing company.

Before taking up his technical studies Mr. Foote learned the trade of machinist and worked in various shops for several years. He has found that the hard knocks and practical experience in the shop have been of great value to him ever since. Mr. Foote's headquarters are at Springfield, Ohio.

Obituary

Charles H. Edmunds, a member of the legal department of the Philadelphia (Pa.) Rapid Transit Company, died on May 6. He was also a member of the Board of Education of Philadelphia and a prominent attorney of that city. He was born on Nov. 26, 1862.

George C. Hoffman, who had been in the employ of the Third Avenue line of the Interborough Rapid Transit, New York, for nearly forty-one years, died at the age of sixty-two. During his railway career he had held positions as a train starter, dispatcher and day trainmaster of the Eastern Division.

Thomas S. Wood, for twenty-seven years resident counsel for the Duluth (Minn.) Street Railway Company and attorney for several railroads and other corporations, died suddenly of heart failure on May 18 at the age of sixty-three. He was an intimate friend of William H. Taft, former President.

T. E. Gatehouse, who for nearly forty years was editor and part proprietor of the *Electrical Review*, London, died several weeks ago in his sixty-seventh year. In his earlier days he was engaged in submarine-cable and electric-lighting work, and in 1882 he became editor of the *Electrical Review*, which is one of the most important technical publications in Great Britain. He was a member of the Institution of Civil Engineers, of the Institution of Electrical Engineers and a fellow of the Royal Society of Engineers. His death has caused a gap in British electric circles and in technical journalism.

Thousands Pay Final Tribute to Master Interurban Builder

Hundreds of railway and electric light men from all over Texas attended the funeral in Dallas, Tex., of Col. J. F. Strickland, whose death was noted in the ELECTRIC RAILWAY JOURNAL recently. Not only did business men from other cities come to pay tribute to his memory but thousands formed in a funeral cortege to show the high esteem in which the master interurban builder was held. Since his death telegrams and messages of condolence have been pouring in from utility operators and financiers located in all parts of the country.

Col. Strickland's death was caused by heart failure. He had been suffering with a weak heart for several months and had planned to start on a long vacation beginning May 23, in the hope of regaining his strength. Physicians say his heart trouble resulted from overwork. He was an indefatigable worker and had been at his office early and late recently on account of the application to city commissioners for an increased fare.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Still Lower Prices on Scrap Iron and Steel

Pig Iron and Sheet Prices Show Revisions Downward in Market About 25 per Cent in Production

During the past week, while there have been only few price revisions of new steel and iron products, there have been several items in the scrap lists which have succumbed to lower prices. Basic pig iron, delivered Pittsburgh, is off 50 cents to $22.96; foundry in Chicago, delivered, is off the same amount to $21.70; No. 2 foundry, Cleveland, is off nearly $1 to $23.50, and various pig irons, f.o.b. furnace, Buffalo, are off from 50 cents to $2. There is a $5 lower market in sheets, quotations on black sheets, Pittsburgh, being obtainable at 3.75 cents and galvanized at 4.75 cents. The upper limits are 4 and 5 cents respectively. The range on blue annealed is 2.85 cents to 3.10 cents. Activity in the steel industry is extremely low with little change from the average rate of operation of 25 per cent noted last week.

The scrap metals show several reductions. Old iron car wheels are $1 lower in Pittsburgh to $14-15 in gross tons, delivered; 50 cents lower in Chicago to $13-13.50 and $1.50 lower in New York to $12.50-13. Steel car axles in Pittsburgh are 50 cents off to $14.50-15.50; steel railroad axles in New York are $1 lower to $10.50-11; in Chicago the drop is 50 cents to $13-13.50. Rerolling steel rails in New York show a 50-cent reduction to $9.50-10; in Philadelphia the result is $1 off to $12.50-13. Old iron rails at Chicago are $1 lower to $16-16.50. Frogs, switches and guards are 25 cents lower in Chicago to $10.75-11.25, and old short steel rails there are off 50 cents to $12-12.50. Steel springs in Chicago are also 50 cents lower to $12-12.50. In this scrap market, too, buying is listless.

Prompt Deliveries of Motor-Driven Track Grinders

Good Demand of First Quarter Reported to Have Shown a Decrease Recently—Some Repair Buying

Buying of motor-driven track grinders is not large at the present time, manufacturers report. One of the largest producers does say that demand was very good during the first quarter and well into the second, but recently it has shown a marked falling off. On the whole, makers of this class of equipment do not seem pessimistic, for some report that considering present abnormal business conditions the volume of orders received is good; others state that they would not expect a large sale of new equipment just now. A few inquiries are being received from steam roads but not many orders. A feature of the present market is the number of orders received in certain quarters for repair parts to enable electric lines to put their track grinding equipment into shape.

Shipments are exceedingly prompt in general, some producers being able to ship motor-driven grinders in one week or even less, and others being able to deliver up to three machines at one time within ten days of receipt of order. Of course this varies depending upon the electrical specifications and capacity of the tool. Raw material is in plentiful supply and about the only limiting factor in deliveries is the time of manufacture.

Raw material in this field has been reduced from 20 to 50 per cent, it is stated, but the price situation on the finished product is not uniform. One producer, for instance, has reduced prices 10 per cent, while another has made no cut, it is stated, because prices were not boosted during the war. Working forces have been reduced as much as one-third and wages are down about 12 per cent with some manufacturers, while several others report no reduction in wages as yet, though conditions, it is stated, make it seem as though this will be necessary.

Germans Competing for Railway Business

That recent activity in Germany along certain lines of steel manufacture such as rails and car wheels has offered competition to American producers has been previously noted in these columns. Germany plans to make further bids for wresting business away from foreign competitors, however, for according to a report of the Guaranty Trust Company of New York, just issued, the government has reduced export duties on pig iron, machine parts, rails, sleepers, axles, points, springs and ball bearings among other products. The new rate is 1 per cent, compared with a tax of 3 to 10 per cent formerly.

In addition the report states that the Linke-Hofman Company at Breslau, one of the leading German manufacturers of railway stock, has just completed large orders for the Belgian, Czecho-Slovakian and Norwegian governments. The manufacturers of railway supplies in Germany report a veritable glut of orders, especially from South Africa, France and China. The Russian Soviet government has placed a large order in Germany for rails, sleepers and other permanent way materials.

National Pneumatic Company After European Business

President and Vice-President, Soon to Sail, Believe Manufacturers Here Must "Beard Lion in Den"

With the object of stimulating interest abroad in the products of their company, Harold Rowntree, president of the National Pneumatic Company, New York City, and Thomas W. Casey, vice-president, expect to make a business trip to Europe next month. Mr. Rowntree and Mr. Casey will sail on the Olympic, July 16, to be gone about three months. Their itinerary includes London, Paris, Holland, Italy and possibly Madrid. Among the more important properties they will visit are the London underground railway system, the Metropolitan Underground of Paris and the Amsterdam surface lines, the latter of which is already doing business with the National Pneumatic Company.

The most important object in view in making this trip, Mr. Casey states, is to interest the two main underground railway systems of Europe in the American practice of multiple-unit system of train control. A subway is now building in Madrid, Spain, which will offer a possible additional market. It is not the intention to visit Germany at the present time. Second to the institution of this system of train control will be the endeavor to interest railway lines in the company's system of pneumatically operated doors.

Mr. Casey is very optimistic over the prospects for business abroad. At the present time he believes that American manufacturers are sitting by too quietly waiting for both domestic and export business to come to them, when the proper procedure he thinks, is to "beard the lion in his den." "The business is there waiting in Europe, but American producers must go after it and wake up foreign buyers before the three obstacles of exchange rates, tariff and competition will ever be overcome." If the company finds a decided prejudice against products manufactured outside the buyer's own country, it will endeavor to have other countries manufacture under its patents.

Current Prices of Cross-Arms

In connection with the article on buying of cross-arms which appeared in last week's issue mention was made of a 10 per cent drop on yellow pine arms earlier this month. Prices now in effect on these arms, quoted by a representative producer, are given below.

The quotations given cover 75 per

cent heart, long-leaf yellow pine and are made f.o.b. Hattiesburg, Miss. Corresponding prices of McCormick fir arms are also given.

Electric light arms, two-pin, 3 ft. x 3¼ in. x 4¼ in., less than 1,000 lineal ft., $28.61 per 100 net, over 1,000 lineal ft., $25.43; 6 ft. x 3¼ in. x 4¼ in., six-pin, less than 1,000 lineal ft., $57.23, over 1,000 lineal ft., $50.87; N. E. L. A. arms, 5 ft. 7 in. x 3½ x 4½ in., four-pin, less than 1,000 lineal ft., $64.72, over 1,000 lineal ft., $57.52; New England arms, 5 ft. 6 in. x 3¼ in. x 4¼ in., four-pin, less than 1,000 lineal ft., $57.23, over 1,000 lineal ft., $50.87. Quotations on the same size arms as above, in the same quantities f.o.b. cars Rutherford, N. J., on McCormick fir are as follows: $51.09, $45.41; $102.18, $90.83; $115.56, $102.72; $102.18, $90.83.

Excellent Deliveries on Malleables

Production Down to One-quarter Capacity as Buying Is Flat—Prices from 5 to 25 per Cent Down

Under present conditions of demand delivery of malleable-iron products is only limited by the time required in manufacture. For standard-pattern items this would probably range in the neighborhood of one month. In view of the situation prevailing in the malleable market just one year ago it seems almost incredible that conditions could have exactly reversed in so short a time. Twelve months ago deliveries were anywhere up to a year behind, while at present operation in this field is only about 25 per cent of capacity and new business is very scarce. The automobile trade, one of the large consumers of malleables, has long been flat, and though it shows some improvement now, automobile manufacturers are well stocked with malleable material purchased at higher prices than now prevail. Railroad buying amounts to little or nothing at present and foreign purchasers are not buying in this country. To make the depression seem worse, the industry is undoubtedly "over-factoried" as a result of war-time expansion.

Prices have followed the pig-iron market down, but not nearly to so great an extent because of the labor factor. Valley furnace malleable pig, Pittsburgh, is worth $23 per ton at present, a drop of more than 50 per cent from the peak. Prices on heavy malleables are estimated to be down from 20 to 25 per cent and more, but on light castings the drop has not been great, being only about 5 to 10 per cent. The reason for this difference is the increased unit cost on the small items due to handling, labor and other charges. Wages are down about 20 per cent, it is stated.

At the present time word has already gone out in the trade of a further reduction in the price of malleables to be made on July 1 amounting to 10 per cent. There seems little hope of this bringing about a stronger volume of buying, very soon, however.

Wood Tie Demand Not Responding to Low Prices

Existing High-Priced Contracts Which Expire July 1 Retard Buying—Water Freight Rates Down

Although producers state that the present is a favorable time to buy wood ties, and prices are down to a level that even buyers admit is about bottom, demand has shown little or no improvement. Current buying is for spot shipments and in much smaller quantities than usual, as it merely covers imperative maintenance needs. Some producers are optimistic that the wood tie business will pick up late this summer, but others can see no activity ahead this year.

Since before the war the roadbed maintenance needs of railroads have piled up and that there is a good future market most people admit. The unknown factor is the extent to which roads throughout the country are stocked with ties, as reports differ on this. If one large steam railroad in the East is a criterion then stocks of ties awaiting use are large, but on the other hand some producers believe they are small in general. Contracts for ties delivered along the right-of-way will not run out until July 1 in a number of instances, and this of course has retarded buying as existing contracts were placed at the high prices of last year. It is these ties, purchased to cover forward needs while deliveries were running long, that represent existing stock in certain quarters.

Producers have decreased production materially, in fact cuttings are made to replace surplus and little else and stocks are under normal too, but at the same time competition is very keen and immediate deliveries are made in general. Prices, as stated before, are well down. A hewn, yellow-pine, sap tie, 8 ft. x 6 in. x 8 in. that sold delivered in New York harbor for $1.65 each at the peak price during the last half of 1920 now brings 95 cents each, a drop of 42 per cent. This reduction is in large part due to the decrease in water freight rates, as most of the Southern pine ties are shipped by water. The present water freight rate on ties shipped to New York in a representative instance is 35 cents each plus a 3-cent tax. This represents a 36 per cent cut from the peak rate of 55 cents and 3 cents tax.

Possible Electric Project for Asia Minor

The National Assembly of the Angora government, according to a report from Assistant Trade Commissioner Gillespie at Constantinople, has authorized the construction of a railway from Sivas to Samsun on the Black Sea. It is quite possible that sufficient water power may be developed from the Kizil Irmak River to permit the electrification of this railroad, which will be less than 200 km. in length. No equipment has been purchased nor has contract for construction been placed.

Rolling Stock

Orleans-Kenner Electric Railway Company, New Orleans, La., has placed in operation one 35-ft. combined passenger and freight-carrying interurban car with a seating capacity of forty-eight persons. The car was built at the company's own shops and completed in thirty days' time, believed to be a record for car construction in the South.

Pittsburgh (Pa.) Railways, mentioned in the Nov. 6, 1920, issue as purchasing twenty-five new double-truck cars, has placed the first of these cars in service. The remainder will follow at the rate of four or five a week, and delivery of the entire number will be completed by July 15, it is expected. The cars, which cost about $14,400 each, are the product of the Standard Steel Car Company, Pittsburgh, Pa., being equipped with Westinghouse electrical apparatus and air-brakes. They were purchased out of the general earnings of the company.

Recent Incorporations

Depew & Lancaster Railway, Lancaster, N. Y.—The Depew & Lancaster Railway, Lancaster, N. Y., has been incorporated by J. J. and E. J. Lenahan and P. Fitzpatrick. The company is capitalized at $200,000 and proposes to operate an interurban electric line from Lancaster to Cheektowaga. The company is represented by T. C. Burke, Marine National Bank Building, Buffalo. This is the successor company to the Buffalo & Depew Railway sold some months ago.

Track and Roadway

Morris County Traction Company, Morristown, N. J.—The Morris County Traction Company is laying new steel rails and new ties and removing the line from the middle to the side of the streets through Wharton, N. J.

Cleveland (Ohio) Railway. — The Cleveland Railway is planning to build 25 miles of new track this summer to replace existing construction. Of this amount, approximately 9 miles have been completed to date.

Tulsa-Sapulpa (Okla.) Interurban Railway.—The Tulsa-Sapulpa Interurban Railway, controlled by the Oklahoma Union Railway, has announced that it will extend its electric line from Keifer to Okmulgee before the end of the year. The extension has been talked of for some time, and will pass through Mounds and Beggs and the rich Beggs oil district adjacent to Okmulgee.

Windsor, Ont.—The Windsor City Council on June 14 authorized the expenditure of $900,000 for improvement of the local street railway system, which is operated by the Hydro-Electric Power Commission of Ontario.

Toronto (Ont.) Railway. — The Toronto City Council, at a meeting on June 14, sanctioned a credit of $7,000,000 for rehabilitation, extensions and equipment for the Toronto Railway system.

Portland Railway, Light & Power Company, Portland, Ore.—A communication demanding that the Public Service Commission of Oregon compel the Portland Railway, Light & Power Company to make the improvements in the maintenance and repair of its tracks which were promised at the time that an increase from 6 to 8 cents in fare was granted was forwarded to Salem recently. It is claimed that the city has failed by a total of $750,976 to keep its implied promise.

Dallas (Tex.) Railway.—The Dallas Railway has no funds with which to lay tracks on St. Paul from Elm to Commerce Street, necessary to make possible the rerouting of the Harwood-Oak Lawn cars to eliminate the "gooseneck" routing down McKinley Avenue and Lamar Street. To lay tracks on St. Paul from Elm to Commerce would cost $100,000, according to engineers of the traction company. The new line on Masten Street will not be used, at least for the present, except for a distance of one block, the San Jacinto line being rerouted to use this portion of the new line.

Tacoma Railway & Power Company, Tacoma, Wash.—The Tacoma Railway & Power Company, according to Manager Richard T. Sullivan, cannot consider the extension of the street car line into the Stevens Street district at its own expense. At a recent meeting of the company officials, city officials, and residents of the district various methods of securing construction of the line were discussed, but no agreement was reached.

Power Houses, Shops and Buildings

United Railways, St. Louis, Mo.—The United Railways is considering putting in operation automatic substations for city use. The total capacity will be 8,000 kw.

Public Service Railway, Newark, N. J.—The Public Service Railway is building a new terminal at the entrance of Clementon Park, Camden County. Double Tracks are being laid on the terminus to give better service, and the building of a ticket office will begin soon. The company has placed a scissors cross-over at the Berlin road crossing so cars can be switched from one division to the other.

Cleveland (Ohio) Railway. — The Cleveland Railway is making a study of its entire power distribution system looking to complete revision of the feeder system. This study is being made partly to determine whether there is any copper not being fully used, and preparatory to the change in the power supply system which is going forward with the installation of automatic substations.

Professional Note

Charles W. McKay, until recently president of the firm of McKay & Sherman of Chicago, has become identified with the American Appraisal Company in the capacity of engineer, Public Utilities Department. Mr. McKay has been engaged in engineering and appraisal work since his graduation from Sibley College of Mechanical Engineering, Cornell University, in 1906. In July, 1906, he entered the employ of the New York & New Jersey Telephone Company (now the New York Telephone Company), and in 1909 he was appointed engineer for the North Brooklyn district, having charge of the preparation of plans and estimating for all outside construction work within the district. In 1911 he was appointed engineer of the Borough of Queens. During the year 1912-13 Mr. McKay was associated with Henry Floy in the capacity of assistant engineer, and in the summer of 1913 he became engineer to the McCall & Clark Company, of New York City. In October, 1913, he became affiliated with McMeen & Miller, Chicago, and later engaged in valuation work for the Central Union Telephone Company, and continued in this capacity until his appointment with the Cooley & Marvin Company as chief appraisal engineer. He later accepted a similar position with L. V. Estes, Inc., of Chicago.

Trade Notes

Frederick C. Horner, for several years transportation engineer of the Packard Motor Car Company of New York, is leaving the Packard Company June 18 to spend two years in Europe in order to make a close study of transportation practice in England, France, Belgium and Germany.

Handlan-Buck Manufacturing Company, St. Louis, Mo., manufacturer of railway supplies, announces the death of its president, A. H. Handlan, on May 28. Mr. Handlan was one of the pioneer railroad lamp and lantern manufacturers in the company's territory, having been in business more than fifty years. His three sons will continue the business as usual.

Barney & Smith Car Company, Dayton, Ohio, according to a recent statement of company officials, expects to receive sufficient orders from the Government of Mexico to justify reopening the plant, contingent upon the recognition of the Obregon government by this country. In this connection Lee Warren James, attorney and representative of the car company and Valentine Winters, receiver, made a trip to Mexico and as a result a number of well-known Mexicans have come to Dayton. Matters have now progressed past the tentative stage and Mr. Winters states that recognition of the Mexican government will mean the reopening of the Dayton car works.

Metal & Thermit Corporation, New York City, in order to handle more satisfactorily its growing detinning business in the West, has constructed and will shortly place in operation in South San Francisco, Cal., a large new plant for the production of detinned billets, in addition to the detinning plants already operated by this company for several years at Chrome, N. J., and East Chicago, Ind. The new plant has also been equipped with a large welding shop containing equipment and facilities for undertaking repairing by the Thermit process. With this new equipment at its disposal the company is well prepared to render service to its Western customers. The new South San Francisco plant will be in charge of E. Kardos, superintendent. The cost of the plant is estimated at about $800,000. The former offices of the company, located at 329-333 Folsom Street, San Francisco, have been moved to the new location.

Howard R. Gass, for the past seven years senior in the engineering department of the Missouri Pacific Public Service Commission, has been appointed sales engineer for the St. Louis Car Company. During his association with the Missouri Commission Mr. Gass was engaged in the valuation of the properties of a number of important electric railways, also handling accident investigations, grade separation problems, signal and interlocking matters and conducting the annual inspection of steam and electric railways for the commission. Prior to this connection Mr. Gass was engaged in steam railroad construction work, having been in charge of viaduct and subway construction, third division of the Kansas City Terminal Railways, and field engineer in charge of all operations for the Union Depot Bridge & Terminal Company, North Kansas City, Mo., also having been associated with the Big Four, Kansas City Southern, St. Louis & San Francisco, M., K. & T., and other properties located in the Southwest.

New Advertising Literature

Steam Turbines.—Bulletin No. 42,019 of the General Electric Company is on the Curtis Steam Turbines for mechanical drive.

Transformers.—The Enterprise Electric Company, Warren, Ohio, is distributing a four-page pamphlet covering its "Peerless" transformers.

Hoists.—Two recent bits of publication from the Electrc Hoist Manufacturers' Association, 165 Broadway, New York City, embody the slogan—"The Strong Arm of Industry." One of these bulletins, "Approved Applications," pictures and describes under 133 headings partial uses to which electric hoists have been applied, while the other one, "Monorail Runway Construction," gives specifications covering standard practice in monorail runway construction, including curves and tables.

Engineering.
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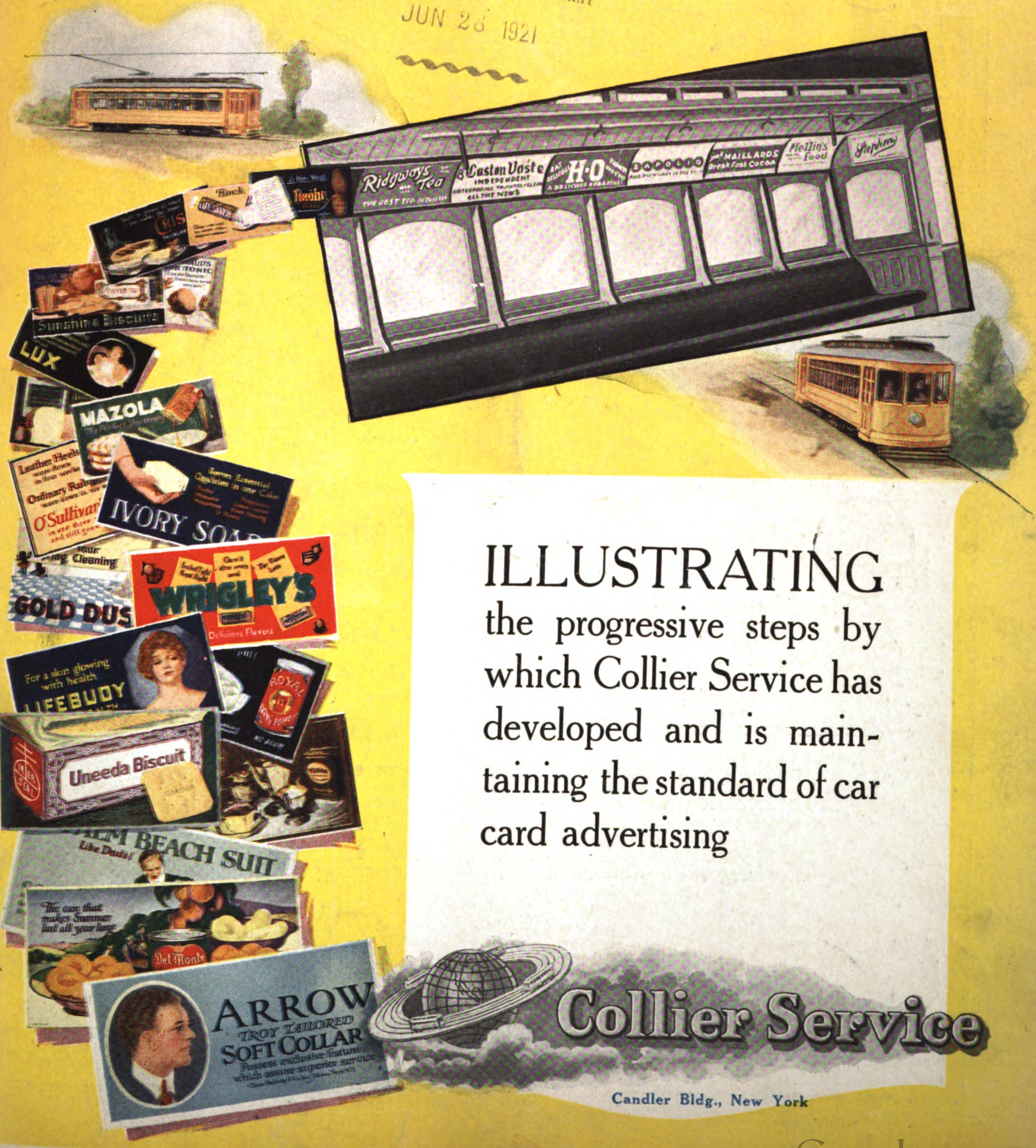
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Vol. 57, *No.* 26 New York, June 25, 1921 *Pages* 1155-1192

Electric Railway Journal

Henry W. Blake and Harold V. Bozell, Editors   Henry H. Norris, Managing-Editor

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Change of Address—When change of address is ordered the new and the old address must be given. Notice must be received at least ten days before the change takes place.

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Solving The Interurban Problem—

W
WESTINGHOUSE ELECTRIC

One of the Missouri & Kansas Railway Automatic Substations

The substation operator, on a basis of work done, is the highest paid man on the suburban railway. His salary, when taken together with equipment costs and upkeep, presents an international interurban railway problem.

An effective solution of this problem was recently obtained by Missouri & Kansas Railway men cooperating with Westinghouse engineers, and their foresight has shown the way for every interurban railway to *reduce operating expenses* and *increase efficiency.*

Two Westinghouse *automatic* substations on this line are now handling a daily load with exceptional ease and with absolutely no attention except an occasional inspection. Although extremely simple in design, these stations are highly efficient.

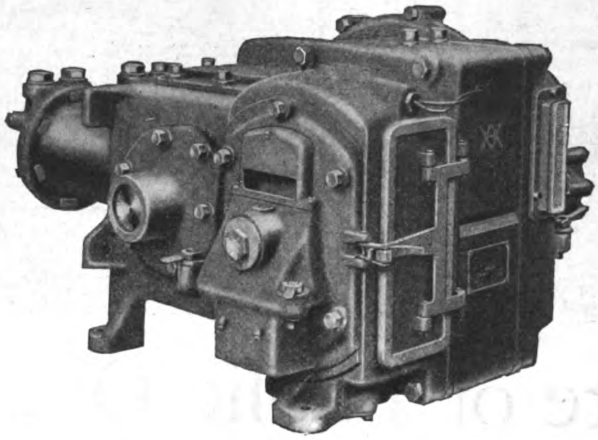
Let Us Solve Your Problem

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.
Offices in all Principal American Cities

Westinghouse
Automatic Substations

now available

A THOROUGHLY PRACTICAL HIGH CAPACITY CONTINUOUS-SERVICE COMPRESSOR



D3F

the height of development

THE D3F Type Westinghouse Compressor, with a displacement of 38 cu.ft. per minute and a capacity for *continuous operation* at 100 lbs. pressure without the possibility of a dangerous rise in temperature, is designed for heavy traction service on Elevated and Subway cars where an unusually large and continuous volume of compressed air is required.

The continuous operation feature represents a marked advance in the design of heavy traction compressors and has been accomplished by the use of a motor so ventilated as to preclude prohibitively high temperatures. The compressor proper also embodies an improved system of positive lubrication which permits of more satisfactory operation than could otherwise be expected.

The machine is of simple, rugged construction, requiring only normal attention and insuring maximum service at a low maintenance cost.

The general design incorporates all the desirable features of the other well-known standard Westinghouse Compressors.

The latest improved-type cars of the New York Municipal Railway are equipped with the D3F.

WESTINGHOUSE TRACTION BRAKE CO.

General Office and Works, Wilmerding, Pa.

ATLANTA
BOSTON
COLUMBUS, O
HOUSTON, TEX.

CHICAGO
DENVER, COL.
MEXICO CITY
NEW YORK

PITTSBURGH
SAN FRANCISCO
ST. LOUIS, MO.
SEATTLE, WASH.

ST. PAUL, MINN.
LOS ANGELES
SALT LAKE CITY
WASHINGTON

Private or Public Operation the Safety Car Is the Choice for Both

The city of New York has gone and done it again!

What?

Purchased more genuine Safety Cars.

The first lot of twenty-eight made such a hit with the public that now another forty-five have been ordered, some to give additional safety service on the Staten Island Midland Lines and others to inaugurate safety service on Williamsburgh Bridge.

What's of further interest is that the City of Detroit has followed New York's example, the first of its twenty-five Safeties already arrived started off the operation of the Detroit Municipal Railway.

The examples of New York, Detroit, Seattle, Pekin, Ill., St. Petersburg, Fla., and other municipal lines will bear quoting if any official of your city administration wants to know the why and wherefore of the Safety Car.

You will be careful to impress him, of course, that these cars were selected because they are equipped with the famous Safety Devices Combination without which *no* car is a Safety Car.

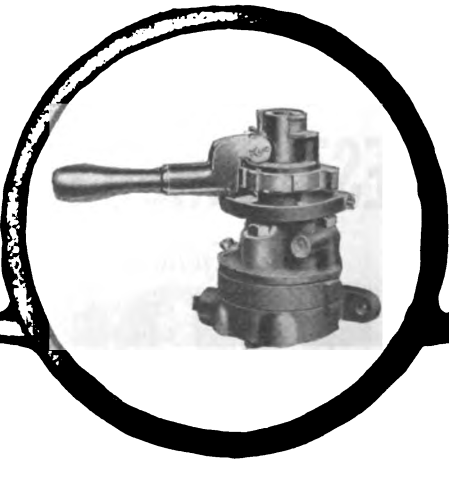
It Is a Genuine Safety Car Only When

it is equipped with automatic laborless apparatus, so interlocked that, regardless of the illness or distraction of the operator the power will be cut off instantaneously, the air brakes and sander apply immediately thereafter and the doors unlatch for safe and easy exit. Furthermore, it is a Safety Car only when the doors must be closed and the step folded before the car can start, and when the airbrake must be applied before the doors are opened and the step lowered in bringing the car to a service stop.

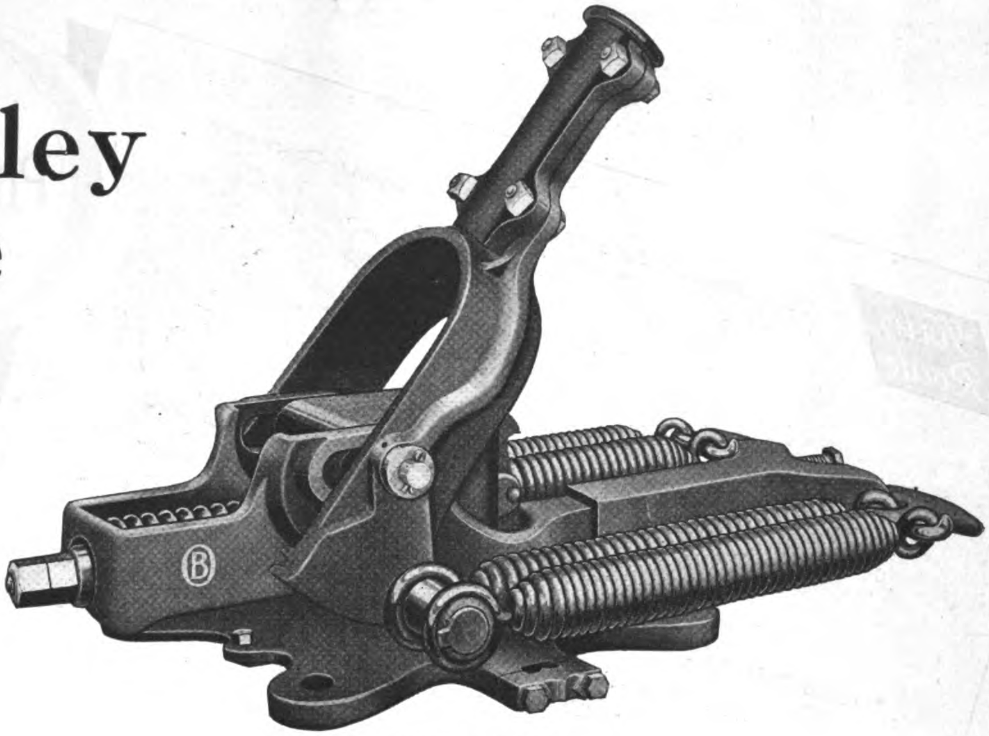
Safety Car Devices Company

Boatmen's Bank Bldg., St. Louis

Chicago San Francisco New York Washington Pittsburgh



O-B Trolley Base



O-B Base—Form 1—Patented

Gives You the Pressure You Want On High Wire and Low

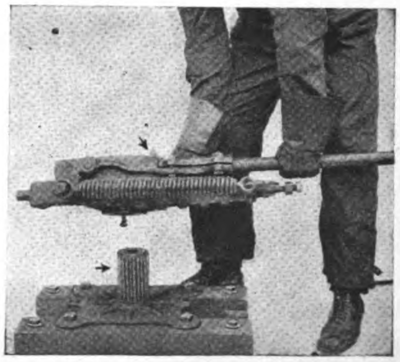
You know what pressure you need on the trolley wire. Set the O-B Trolley Base for it.

It will give you a practically uniform pressure from under the roof hook to an almost vertical pole position. Always you get enough to hold wheel to wire—never undue, destructive pressure.

Especially is this uniform pressure desirable in the horizontal pole position, as it keeps the pole from jumping free of the roof hook.

O-B Base has several other worth-while characteristics. It has strength to spare for hard service. It is easy to take care of because it is accessible and simple. All bearings have renewable bushings—for a little money an old O-B Base can be made new again.

O-B Bases are absolutely interchangeable—repair parts always fit.



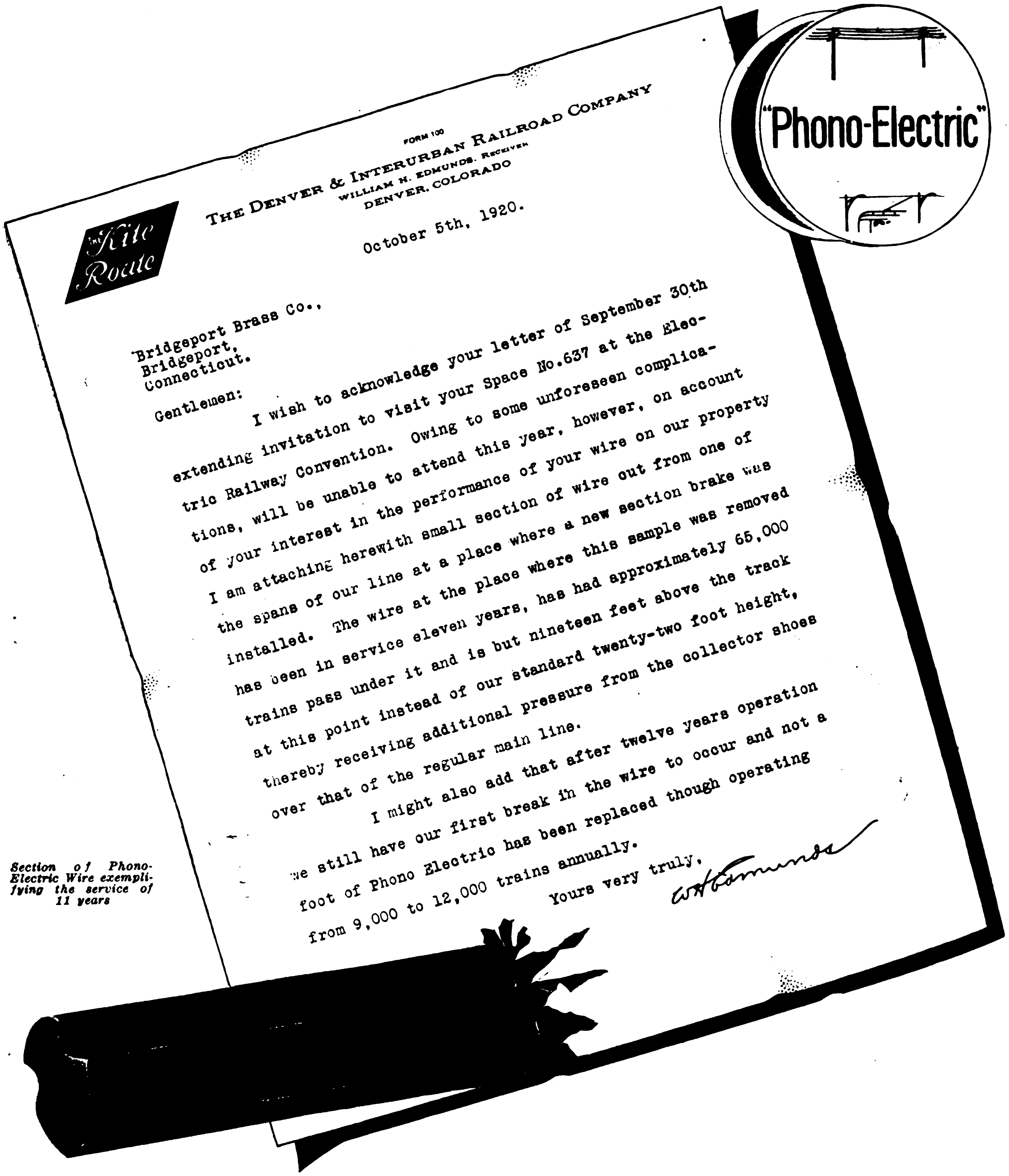
One man lifts the base off the stem and exposes all the vital parts.

Notice, particularly, the hook-down feature and the caged roller bearings.

The Ohio Brass Company, Mansfield, Ohio

Manufactures: Trolley Materials; Rail Bonds; High Tension Porcelain Insulators; Third Rail Insulators; Electric Railway Car Equipment.

New York, Philadelphia, Pittsburgh,
Chicago, Los Angeles, San Francisco,
Paris, France



"Phono-Electric"

The Kite Route

FORM 100

THE DENVER & INTERURBAN RAILROAD COMPANY
WILLIAM H. EDMUNDS, RECEIVER
DENVER, COLORADO

October 5th, 1920.

Bridgeport Brass Co.,
Bridgeport,
Connecticut.

Gentlemen:

I wish to acknowledge your letter of September 30th extending invitation to visit your Space No.637 at the Electric Railway Convention. Owing to some unforeseen complications, will be unable to attend this year, however, on account of your interest in the performance of your wire on our property I am attaching herewith small section of wire cut from one of the spans of our line at a place where a new section brake was installed. The wire at the place where this sample was removed has been in service eleven years, has had approximately 65,000 trains pass under it and is but nineteen feet above the track at this point instead of our standard twenty-two foot height, thereby receiving additional pressure from the collector shoes over that of the regular main line.

I might also add that after twelve years operation we still have our first break in the wire to occur and not a foot of Phono Electric has been replaced though operating from 9,000 to 12,000 trains annually.

Yours very truly,

W H Edmunds

Section of Phono-Electric Wire exemplifying the service of 11 years

Phono-Electric Trolley Wire Gives Satisfactory Service Everywhere

Bridgeport Brass Company
Bridgeport Connecticut

2277

What 109 to 2851 means to you

The curve shown on this page indicates the average number of Steel Twin Ties to each order for the last ten years.

Its steep and rapid ascent from 109 ties in 1911 to 2,851 in the first half of 1921 is ample evidence of the wide spread approval by track engineers of Steel Twin Tie Track.

The dollars and cents reason is the strongest for the use of this type of track in paved streets. Its first and final cost is lower than conventional types with wood ties. It economizes in grading; in concrete; in labor.

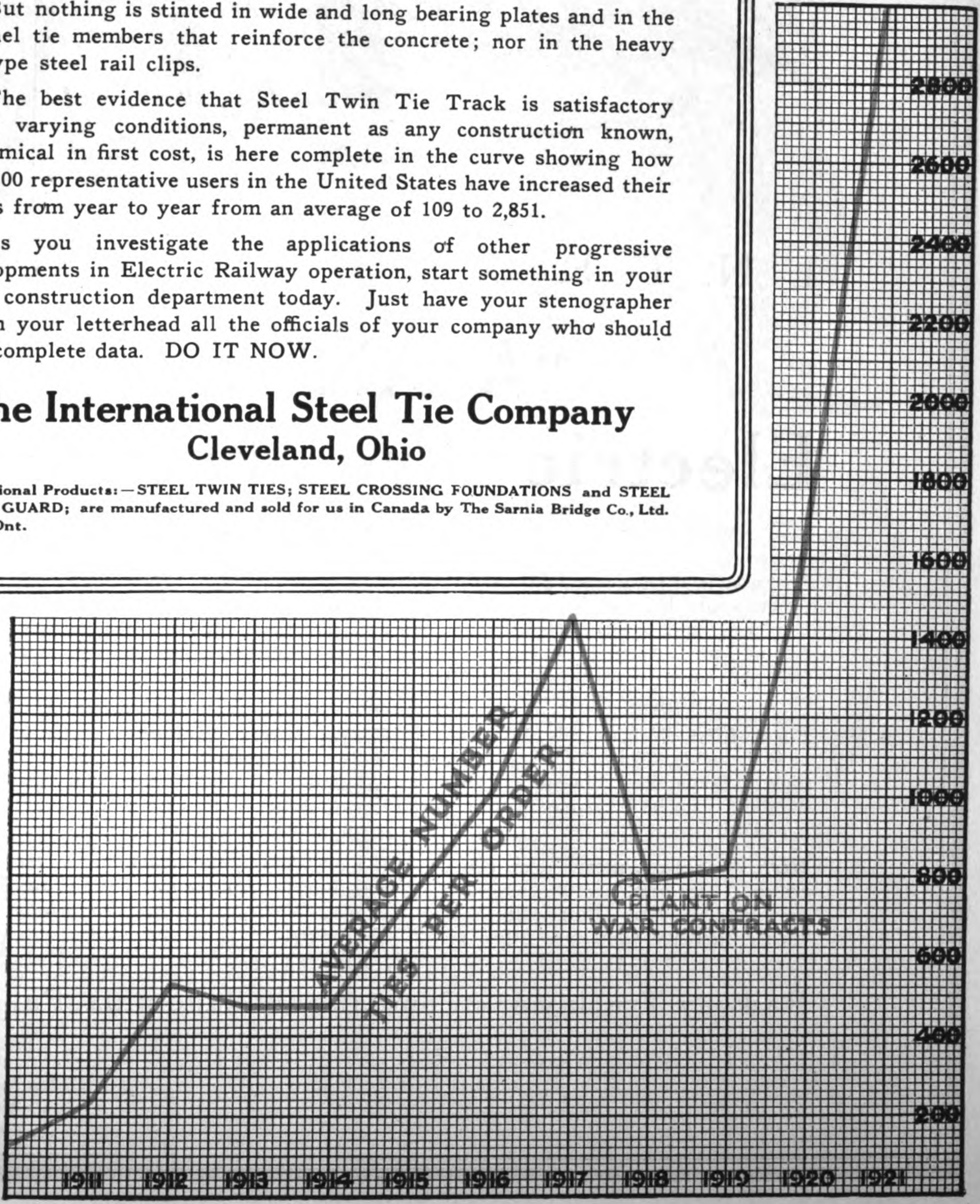
But nothing is stinted in wide and long bearing plates and in the channel tie members that reinforce the concrete; nor in the heavy jaw-type steel rail clips.

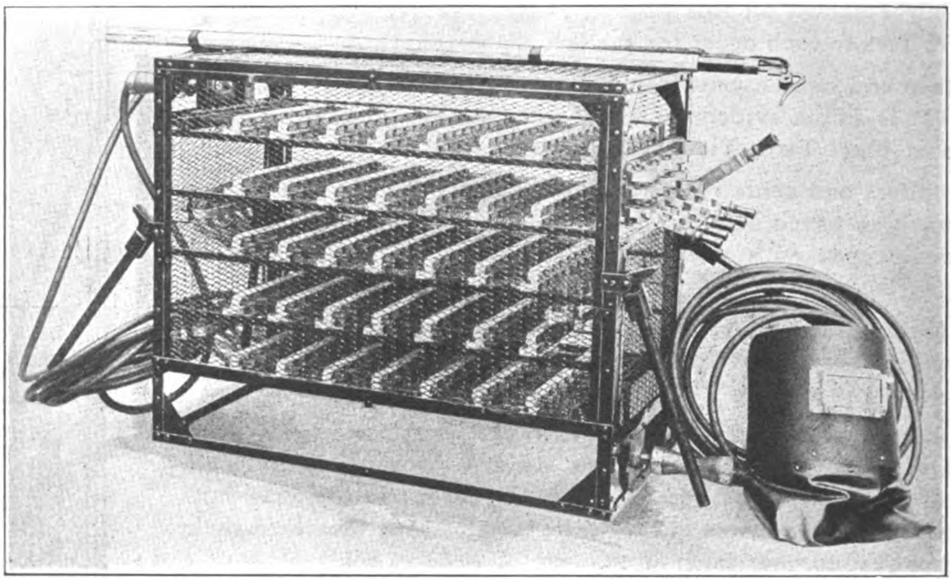
The best evidence that Steel Twin Tie Track is satisfactory under varying conditions, permanent as any construction known, economical in first cost, is here complete in the curve showing how over 100 representative users in the United States have increased their orders from year to year from an average of 109 to 2,851.

As you investigate the applications of other progressive developments in Electric Railway operation, start something in your track construction department today. Just have your stenographer list on your letterhead all the officials of your company who should have complete data. DO IT NOW.

The International Steel Tie Company
Cleveland, Ohio

International Products:—STEEL TWIN TIES; STEEL CROSSING FOUNDATIONS and STEEL PAVING GUARD; are manufactured and sold for us in Canada by The Sarnia Bridge Co., Ltd. Sarnia, Ont.





INTRODUCING

"AJAX" Electric Arc Welder

Now offered after having demonstrated by three years of service that it is capable of safeguarding the reputation made by our Reciprocating, Universal and Atlas rail grinders. Among the features that will especially appeal to electric railway men are:

Portability—Weighs only 120 lbs. is 18 in. wide, 36 in. long by 28 in, high. Convenient hinged carrying handles. Can be transported on any car platform.

High Amperage means deep penetration—333 amp. at 600 volts, 209 amp. at 250 volts. Practically 50% higher capacity than any other resistance machine on the market, ample for good welding under all ordinary conditions. Good also for carbon arc welding.

Accessibility—All parts easy to get at, all circuits plainly traceable, all repairs easy to make with unskilled labor.

Completeness—Equipment includes everything necessary to start work—no extras to buy. Even the face shield, trolley pole, cables and welding handle are included.

We are staking our reputation on the satisfactory performance of these machines. Write us for complete details and prices.

Railway Track-work Company, Philadelphia, Pa.

IMPORTANT

We claim that "Golden Glow" reflectors are not only by far the best, the most efficient and the most permanent reflectors at the present time offered for railway headlight service, but also that on account of the specially developed processes and machinery used in their manufacture they are the only accurately made, ground and polished parabolic glass reflectors on the market that can be manufactured and sold at a commercial price.

No headlight is a real headlight unless it has a **real** reflector. The headlight case is simply a container for the reflector.

When you buy headlights—buy the reflectors. Buy Golden Glow Headlights and get the best headlights at a reasonable first cost.

Write for Catalog Sheets

Type T Golden Glow Headlight, 9-in. Reflector for city and suburban service.

Type T Golden Glow Headlight, 12-in. Reflector for ordinary interurban service.

Type T Golden Glow Headlight, 14-in. Reflector for high speed interurban service

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA
17th and Cambria Streets

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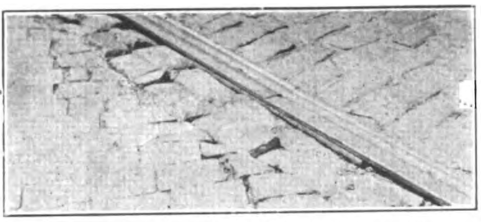
50 Church St.

CHICAGO
Monadnock Building

Branch Offices: Boston, Scranton, Pittsburgh **Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal, Toronto**



Typical loose condition of pavement as result of cupped mechanical joint.

Thermit Insert Weld installed in street. Joint and pavement troubles eliminated.

Cause and Prevention

The continual pounding of car wheels on mechanical or partially welded joints soon causes the joints either to shake loose or break.

The loosening or breakage of the joints causes the car wheels to pound them all the more, which in turn causes cupping.

The cupping of the rail joint causes the rails to loosen all the more.

The loosening of the rails at this point causes water to seep in.

The seeping in of water causes the pavement to loosen up, in the manner shown in the illustration.

The loosening of the pavement causes necessity for making premature and frequent pavement renewals.

Loose and cupped rail joints cause the joint to be pounded to pieces.

The deterioration of the joint shortens the life of the rail.

Frequent renewals of short lived rails.

The frequent pavement renewals cause an excessive leak in your track maintenance expense

THERMIT INSERT RAIL WELDS

Prevent all these things

The superheated liquid steel produced by the Thermit reaction effects a pure butt weld on each side of a white hot insert of the same analysis to that of the rail is placed between the rail heads.

After grinding, the result is a continuous surface of rail with the joint absolutely eliminated.

The elimination of the joint prevents cupping or breakage.

The prevention of cupping or breakage prevents frequent rail renewals and absolutely eliminates maintenance during the life of the rail.

Send for our latest Rail Welding Pamphlet 3932.

METAL & THERMIT CORPORATION

Boston
Chicago
Pittsburgh

120 Broadway

SERVICE STRENGTH
THERMIT WELDING
ECONOMY

New York

Toronto
South San Francisco

Modernize! *Pneumatize!*

For Better Horizontal Transportation

You don't see many of those old-time rope cable elevators nowadays, do you?

The control devices of the modern elevator leave little more for the operator's attention than the safety of passengers and accuracy of stops.

If such improvements have been found desirable in *vertical, fare-less* transportation, how much more desirable it is to minimize manual labor in *horizontal* transportation in which the need for safety and speed must be taken in connection with the further need for collecting a fare from each and every rider.

Having studied this problem in every detail we will be pleased to confer with you as to which of the following will best enable you to get more car-miles per hour and more money per car-mile at a decrease in both labor and accident cost.

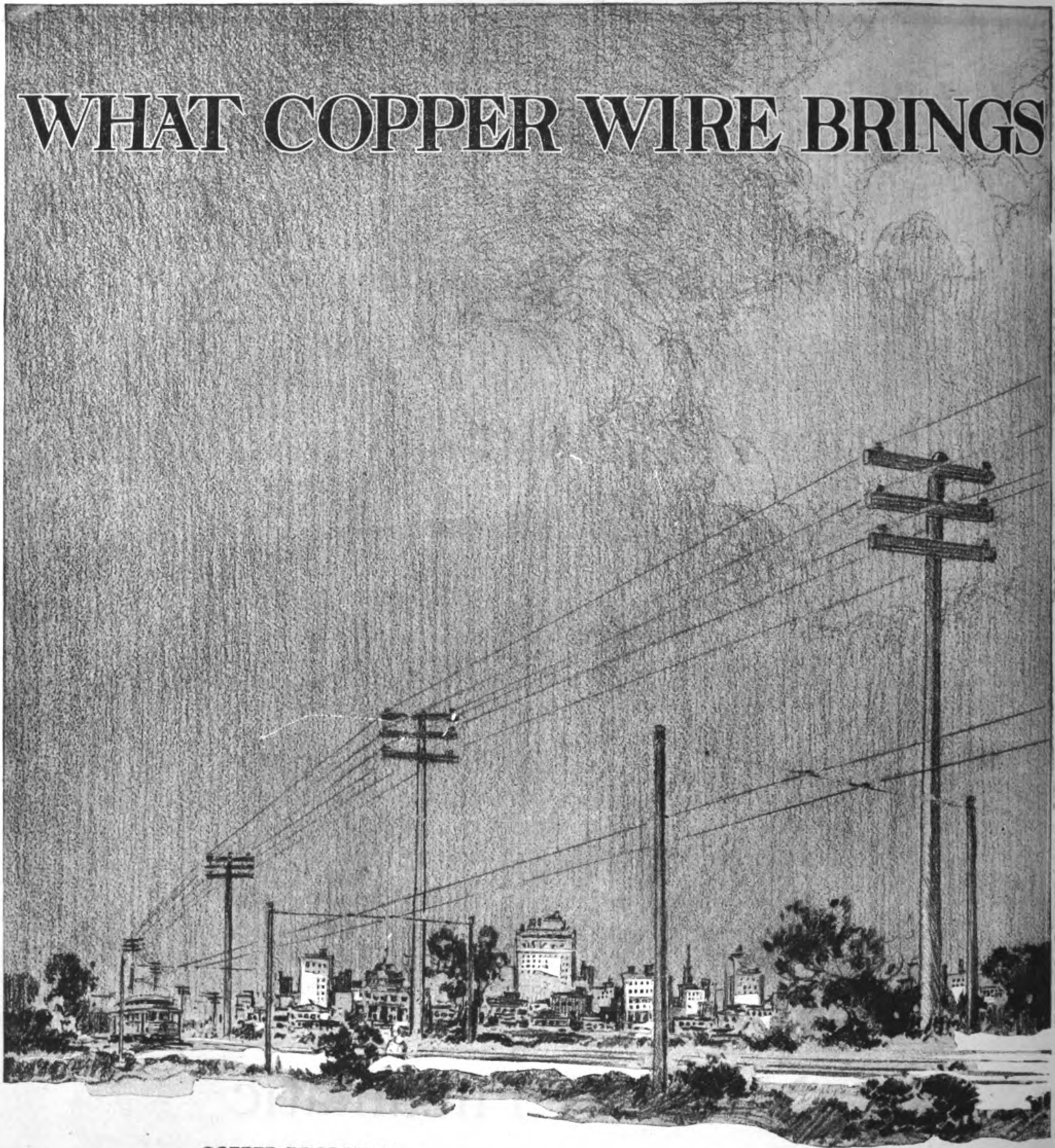
National Pneumatic

Door and Step Control
Motorman's Signal Lights
Door and Step Operating Mechanisms
Safety Interlocking Door Control
Multiple Unit Door Control

Which can be adapted in whole or part to make your cars embody the last words in fastest, safest, most economical operation.

Manufactured in Canada by
Dominion Wheel & Foundries, Ltd.
Toronto, Ont.

National Pneumatic Company, Inc.
50 Church St., New York
Edison Bldg., Chicago
Works: Rahway, N. J.



COPPER PRODUCTS

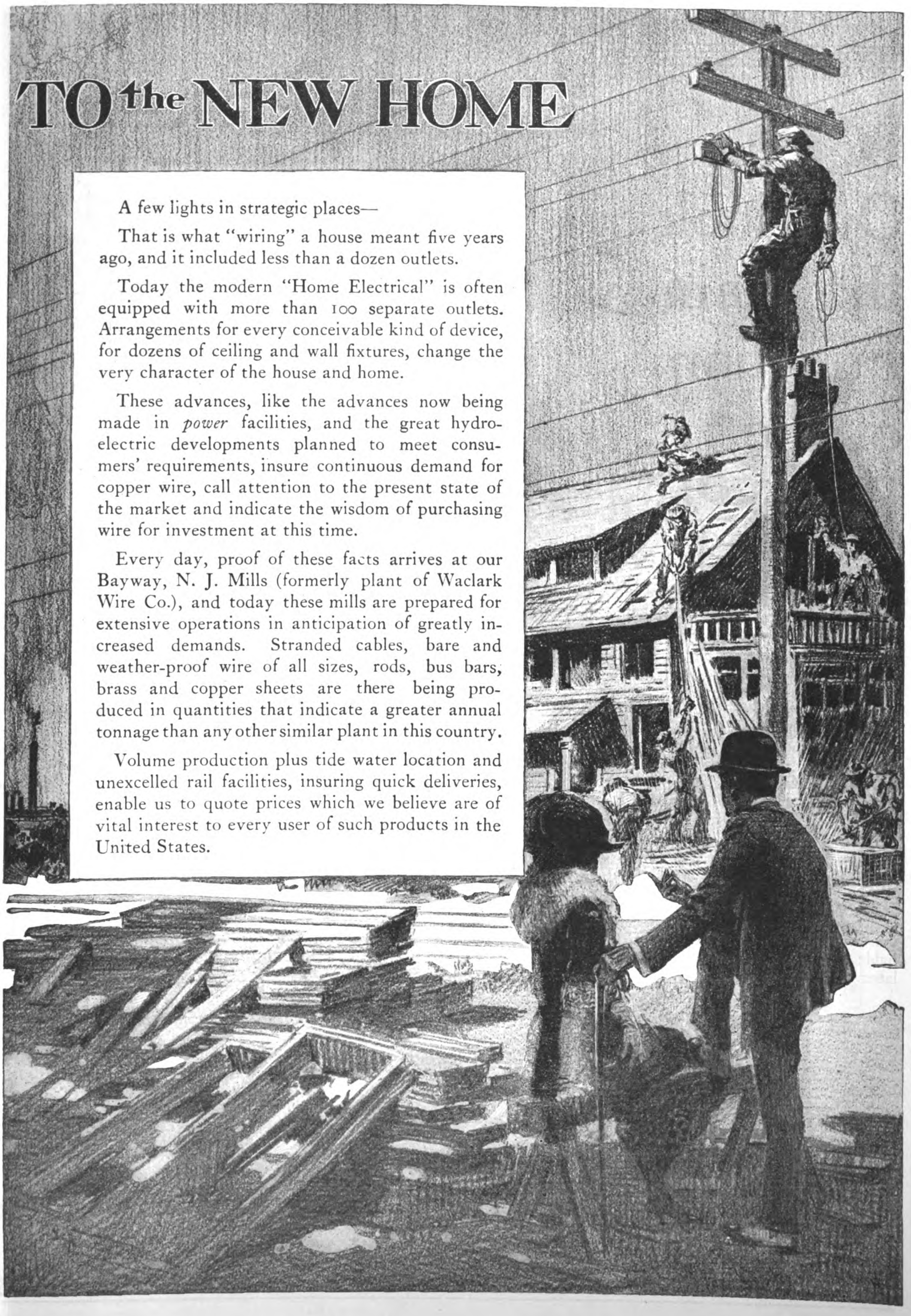
Round Bare Wire
Bare Strand
Trolley Wire—Round and Shaped
Flat and Square Bare Wire
Tinned Wire and Strand
Weather-proof Wire and Strand
Slow-burning Wire and Strand
Bus Bars
Copper in Rolls
Rolled Rods
Drawn Rods—Round, Square and Rectangular

BRASS AND BRONZE PRODUCTS

Brass and Bronze Sheets
Brass and Bronze Round Wire
Brass and Bronze Flat and Square Wire

Mills, Bayway, N. J.

AMERICAN COPPER PRODUCTS
CORPORATION
200 BROADWAY NEW YORK



TO the NEW HOME

A few lights in strategic places—

That is what "wiring" a house meant five years ago, and it included less than a dozen outlets.

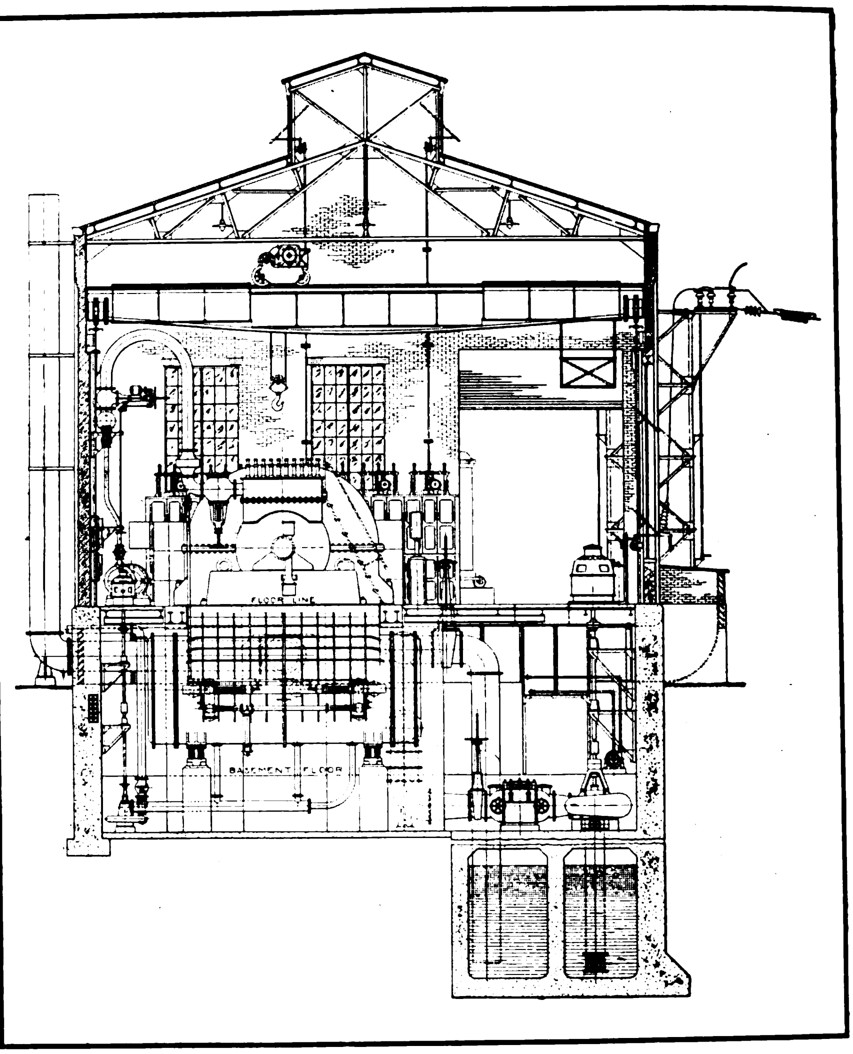
Today the modern "Home Electrical" is often equipped with more than 100 separate outlets. Arrangements for every conceivable kind of device, for dozens of ceiling and wall fixtures, change the very character of the house and home.

These advances, like the advances now being made in *power* facilities, and the great hydro-electric developments planned to meet consumers' requirements, insure continuous demand for copper wire, call attention to the present state of the market and indicate the wisdom of purchasing wire for investment at this time.

Every day, proof of these facts arrives at our Bayway, N. J. Mills (formerly plant of Waclark Wire Co.), and today these mills are prepared for extensive operations in anticipation of greatly increased demands. Stranded cables, bare and weather-proof wire of all sizes, rods, bus bars, brass and copper sheets are there being produced in quantities that indicate a greater annual tonnage than any other similar plant in this country.

Volume production plus tide water location and unexcelled rail facilities, insuring quick deliveries, enable us to quote prices which we believe are of vital interest to every user of such products in the United States.

Don't Overlook the Main Function of the Power Plant



The one essential of the power plant is to supply electrical energy at the lowest possible cost.

A careful assembly of highest grade equipment in Unit Power Plant design insures lowest investment per kilowatt of capacity and requires a minimum number of operators. These designs provide for one level operation. All equipment is so arranged that one operator may have entire charge of each turbine unit including all its auxiliaries. All parts of equipment are easily accessible, thus facilitating inspection and repairs.

All electrical equipment including switchboard and auxiliary motors is located on main floor. This centralizes the control of the plant and insures reliable operation as well as minimum labor.

Well lighted and ventilated buildings insure efficient and reliable operation. Thoroughly fireproof buildings of lowest cost insure lowest possible fixed charges including interest, taxes and insurance. From time to time other features of Unit Power Plant designs dealing with essential parts of power generating systems will be shown here.

Our unit power plant designs permit building for present requirements and allowing for future extensions. A standardization of assembly has been effected based on years of experience which insures maximum value for minimum investment. The cost varies from the initial investment approximately in direct proportion with the installed capacity.

Without obligation or cost on your part, we would be glad to make preliminary recommendations on your problems. Write for Booklet A.

E. W. CLARK & CO., Management Corporation

Columbus, Ohio

The World's best Lubricants

GALENA QUALITY

Going a Step Further

Fifty years of specialization in one particular branch of the oil business—*railway lubrication,* has developed Galena Oils to a state of perfection that they are recognized everywhere as the highest grade railway oils possible to manufacture.

But it is not the policy of this company to rest content with the creation of *better lubrication,* hence the development of *better lubrication service,* as exemplified in the master organization of specialists known as the Galena Mechanical Expert Department.

The co-operation offered through the medium of this exclusively Galena Service is daily proving its value on hundreds of railways, by invariably securing results in efficient and economical lubrication that show quickly in improved operation.

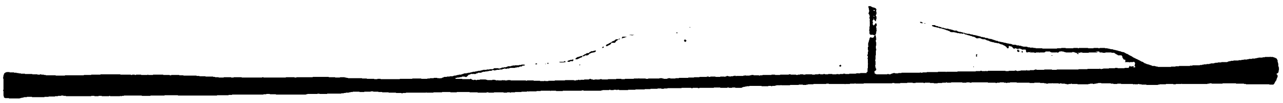
Just as the efforts of duplicating Galena Oils have failed through lack of *quality,* so likewise have the attempts to copy Galena Service been made ridiculous by absence of the vital essentials of knowledge and experience.

When Galena Service Goes In
Lubrication Troubles Go Out!

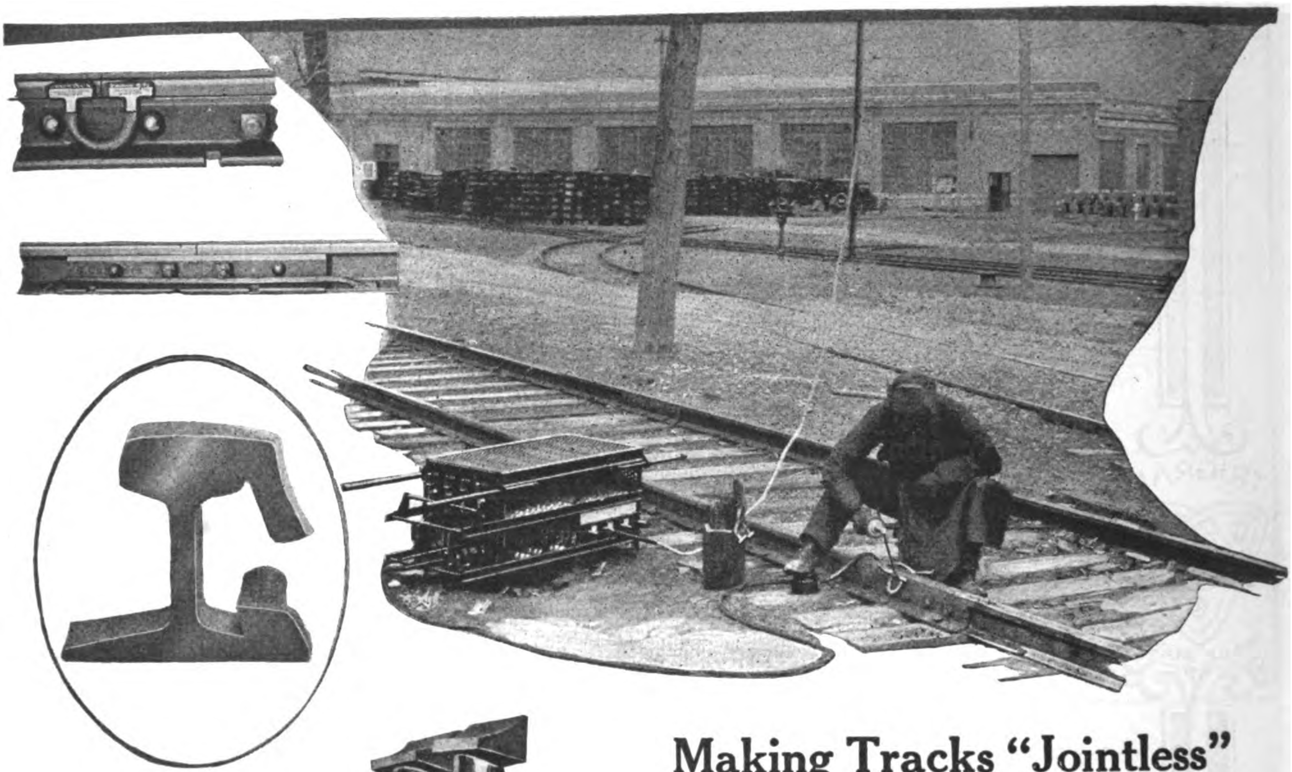
TRIGRAM G S O C TRADE MARK

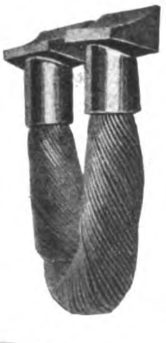
THE GALENA-SIGNAL OIL CO.
NEW YORK FRANKLIN, PA. CHICAGO
Offices in all principal American Cities
LONDON BUENOS AIRES PARIS

GALENA SERVICE



A rail as long as the system and without a joint would be ideal for the power service of a street railway

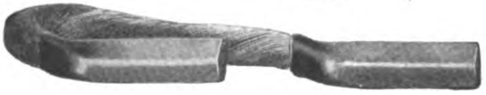




SF-1 Arc Weld Bond
For attaching to
Rail Head

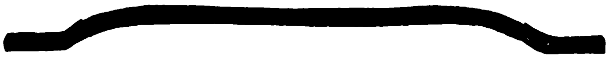
Making Tracks "Jointless" with G-E Welded Bonds

Welding a bond to a rail today need not be the troublesome task of fusing copper with steel. G-E Rail Bonds have steel faces expertly arc welded in the factory to drop forged copper terminals. Thus a track welder merely makes the perfect steel weld he is used to, and the bond becomes an integral part of the track—wiping out the joint.



SF-4 Arc Weld Bond
For use with Weber Joints

G-E Welded Rail Bonds, either U-shaped for rail heads or of the flexible, long type for spanning splice bars are the outgrowth of broadest experience in railway work. They can be supplied in forms to satisfy any need.



SF-6 Arc Weld Bond
For attaching to rail base

General Electric Company

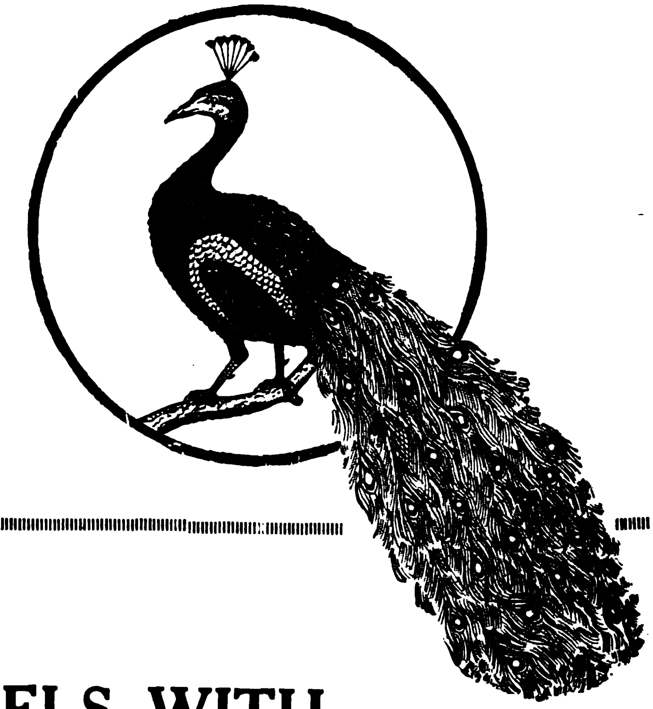
General Office
Schenectady, N.Y.

Sales Offices in
all large cities

60-187

PEACOCK SAYS—

don't leave it
to the fender!



An effective fender is
good insurance, but—

STOP THOSE WHEELS WITH

PEACOCK BRAKES

The fender may succeed in snatching a life from the on-rushing wheels, but the motorman and the claim department would rather *stop those wheels.* That's why they praise the quick stops and perfect control obtained with Peacock Brakes.

Always Ready

No question about being able to use a Peacock Brake in time of emergency. This is a brake which the motorman understands and trusts like an old friend in time of need.

The Peacock Staffless

Always Recognized

No question about recognizing Peacock Brakes. Their unique appearance is familiar to every experienced motorman who has been railroading around the country. Watch for them when you are inspecting other properties.

NATIONAL BRAKE COMPANY
890 Ellicott Square
Buffalo, N. Y.

Bankers and Engineers

Ford, Bacon & Davis

115 BROADWAY, NEW YORK

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WORCESTER POLYTECHNIC INSTITUTE
WORCESTER, MASSACHUSETTS

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FARES, BUSES, MOTOR TRUCKS
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Energy Measurement
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Investigations · Tests · Recommendations

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The Most Successful Men in the Electric Railway Industry read the

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Every Week

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Cincinnati, Ohio . . . Union Trust Building
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Denver, Colo. . First National Bank Building
Salt Lake City, Utah . . Walker Bank Building
Duluth, Minn. . . . . . Wolvin Building
Minneapolis, Minn. . . 7th Ave. & 2nd St., S. E.

Pacific Coast Representative:
U. S. Steel Products Co., Pacific Coast Dept.
San Francisco, Cal. . . . . Rialto Building
Portland, Ore. . . . . . Selling Building
Seattle, Wash. . 4th Ave. So., Cor. Conn. St.

Export Representative: United States Steel Products Co., 30 Church St., N. Y.

MARK WOLFF
Certified Public Accountant
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DAY & ZIMMERMANN, INC.
ENGINEERS
Design, Construction
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The Most Successful Men
in the Electric Railway
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ELECTRIC
RAILWAY JOURNAL

Every Week

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Consulting Engineers
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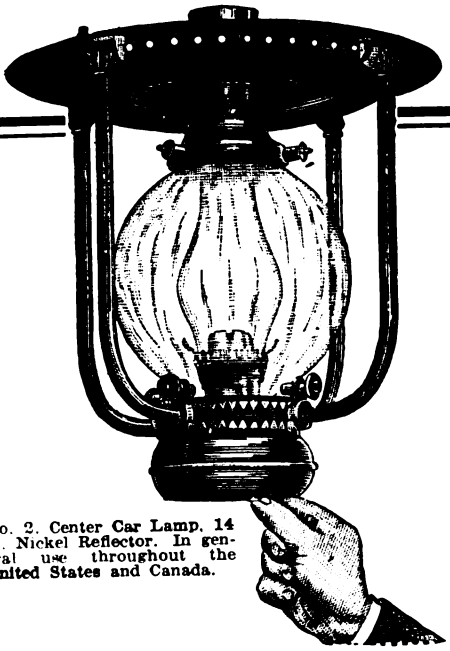
THE P. EDWARD WISH SERVICE
50 Church St.
NEW YORK
DETECTIVES
Street Railway Inspection
131 State St.
BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.



No. 2. Center Car Lamp. 14 in. Nickel Reflector. In general use throughout the United States and Canada.

Thirty-two years ago—One of the exhibits in the 1889 *Convention Issue*

THE BIG EVENT

of the

ELECTRIC RAILWAY YEAR

The Convention of the

American Electric Railway Association

this year at Atlantic City during the week of October 3

A FEATURE OF THE BIG EVENT

The exhibit of electric railway equipment, materials and supplies.

This year bigger and better than ever before in the advertising section of the

ELECTRIC RAILWAY JOURNAL

In which the leading manufacturers have exhibited their newest and best products for more than a generation. The date of this year's exhibit or

CONVENTION ISSUE, SEPTEMBER 24, 1921

ELECTRIC RAILWAY JOURNAL, Tenth Avenue at 36th Street, NEW YORK

PENETRATION

The Yard Stick That Measures Pole-Life

IN the Butt-Treatment of poles every pole buyer knows that only by guaranteed uniform penetration can he be sure that his poles are insulated against decay. In the P & H Guaranteed Penetration Process, for the first time in the pole industry uniform depth of penetration of the preservative throughout the groundline area is guaranteed. The specifications for the P & H process are not merely a specified method. Specifications for the P & H Guaranteed Penetration Process call for a definite result that must be obtained — ½ inch uniform penetration. This result is guaranteed to pole buyers. This is the practical solution of your greatest pole problems and assures longer life for poles, fewer replacements and lower maintenance costs.

Sample selected at random, showing the uniform one-half inch penetration.

On the end of every pole Butt-Treated by the P & H Guaranteed Penetration Process is countersunk the metal disc shown below. With every shipment of poles the buyer receives the written guarantee. These are your assurance of guaranteed uniform penetration.

Accept no substitute process of Butt-Treatment.
Insist on the P & H Guaranteed Penetration Process.

Full Particulars on Request

PAGE & HILL CO.
Minneapolis, Minn.

BRANCH OFFICES:

Times Bldg., NEW YORK, N. Y.
717 Bryant Bldg., KANSAS CITY, MO.
19 So. La Salle, CHICAGO, ILL.
1111 Carter Bldg., HOUSTON, TEXAS
311 Sumpter Bldg., DALLAS, TEXAS
1416 Starks Bldg., LOUISVILLE, KY.

Originators of the P & H Guaranteed Penetration Process. Producers, manufacturers, and foremost in the Butt-Treatment of Poles.

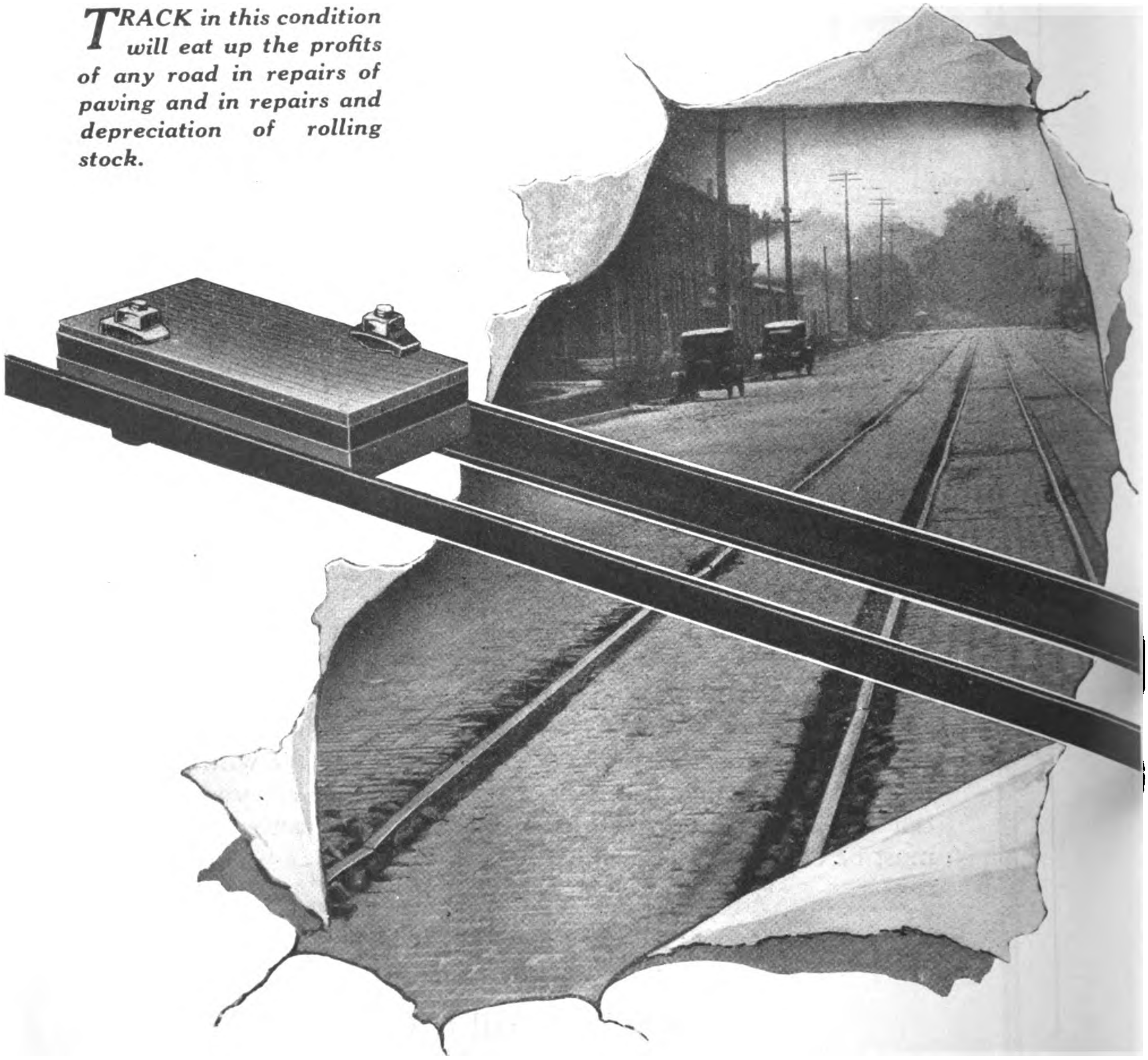
Butt-Treated
BY
PAGE & HILL CO.
1921
GUARANTEED
One-Half Inch
PENETRATION

This disc countersunk on the butt-end of every pole Butt-Treated by the P & H Guaranteed Penetration Process is your assurance of one-half inch penetration.

Butt-Treated
BY
PAGE & HILL CO.
1921
GUARANTEED
One-Half Inch
PENETRATION

NOW You can relay

TRACK in this condition will eat up the profits of any road in repairs of paving and in repairs and depreciation of rolling stock.



DAYTON

that stretch of bad track

with a construction

—that foremost engineers recognize as the most dependable
—that the test of time has proven will outlast all others
—that will save you from $2,000 to $6,000 per mile

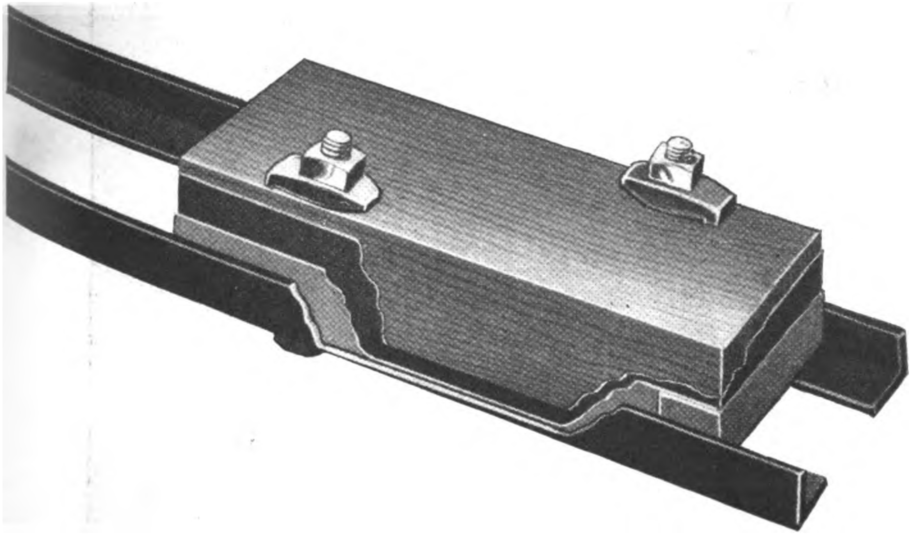
Endorsed by Engineers Engineers everywhere endorse, without question, Dayton Resilient Ties. They now acknowledge that track construction without resiliency will fail, regardless of how heavy the rails or how thick the foundation.

Many roads have adopted Dayton Resilient Ties as their standard for all track construction, because the wood block and bed of asphalt of these ties protect the track foundation from disintegration by absorbing all vibrations and hammer-like blows caused by rolling stock.

Proven by Time Time has proven beyond dispute that Dayton Resilient Ties are built on the only correct principle for track construction. In more than twelve years there is not a single case on record of any track or joint failure where Dayton Resilient Ties have been used. Not only that, but the first track laid on these ties is still apparently as good as the day it was put down. Not one penny has been spent either for up-keep of track or paving repairs, and from all indications it will serve for twelve more years.

Reduce First Cost The first cost of track laid on Dayton Resilient Ties is less per mile than for any other construction. Through their use you will save more than $2,000 per mile over track laid on wood ties in gravel ballast, and more than $6,000 per mile over track laid on wood ties in concrete.

Repairs to rolling stock are practically eliminated, because the vibrations are absorbed by the wood block and asphalt in each tie, preventing the crystallization of steel and the chattering and loosening of all car parts.



Mail Coupon for Complete Facts

Let us tell you in detail all about Dayton Resilient Ties. Let us tell you the experiences of other users. Just have your stenographer pin the attached coupon to your letterhead and we will send you our bulletin which shows in detail the construction of Dayton Resilient Ties, how they are installed, and photographs of successful installations.

The Dayton Mechanical Tie Co.
708 Commercial Bldg., Dayton Ohio

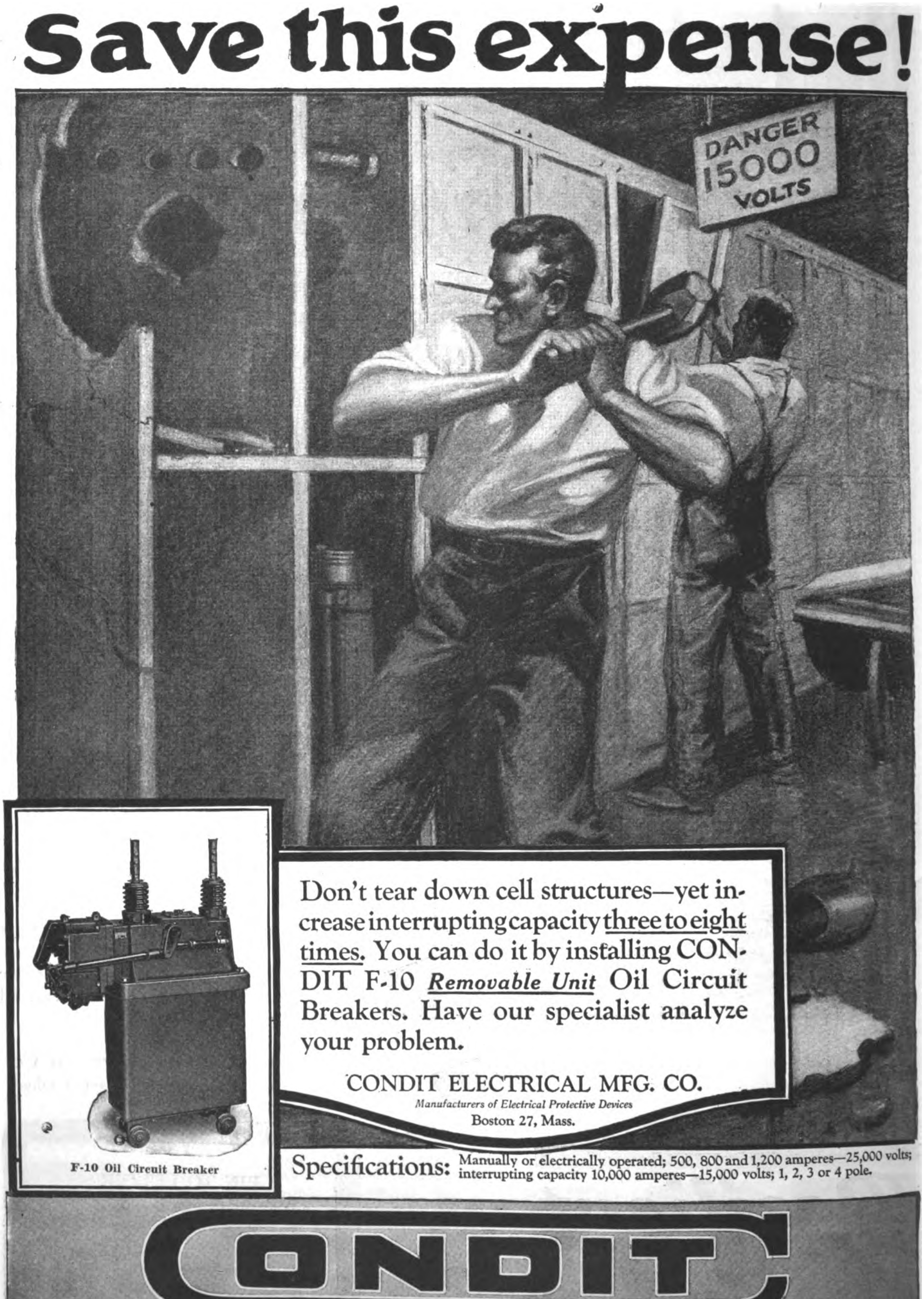
Resilient TIE

PIN TO LETTER

Dayton Mechanical Tie Company
708 Commercial Bldg.,
Dayton, Ohio

Without obligation, please send me full information about your Dayton Resilient Ties.

Save this expense!



F-10 Oil Circuit Breaker

Don't tear down cell structures—yet increase interrupting capacity three to eight times. You can do it by installing CONDIT F-10 *Removable Unit* Oil Circuit Breakers. Have our specialist analyze your problem.

CONDIT ELECTRICAL MFG. CO.
Manufacturers of Electrical Protective Devices
Boston 27, Mass.

Specifications: Manually or electrically operated; 500, 800 and 1,200 amperes—25,000 volts; interrupting capacity 10,000 amperes—15,000 volts; 1, 2, 3 or 4 pole.

CONDIT

N-L
MECHANICAL
· SANDERS ·

1356 Mechanical Sanders sold the first five months of 1921

When a mechanical device is accepted and installed as standard equipment by the most progressive Electric Railways in the United States it's a true indication that that device is filling a *real want* and performing an important and necessary *service.*

That's the present situation as regards N-L Mechanical Sanders.

Ten large Electric Railways have bought N-L Mechanical Sanders so far in 1921—made them standard equipment on a total of 1356 street cars.

These electric railways regard the purchase of this equipment not as an expense but as an *investment*—an investment that now pays and which will continue to pay real dividends in the form of 100% *protection* from possible accident due to lost air.

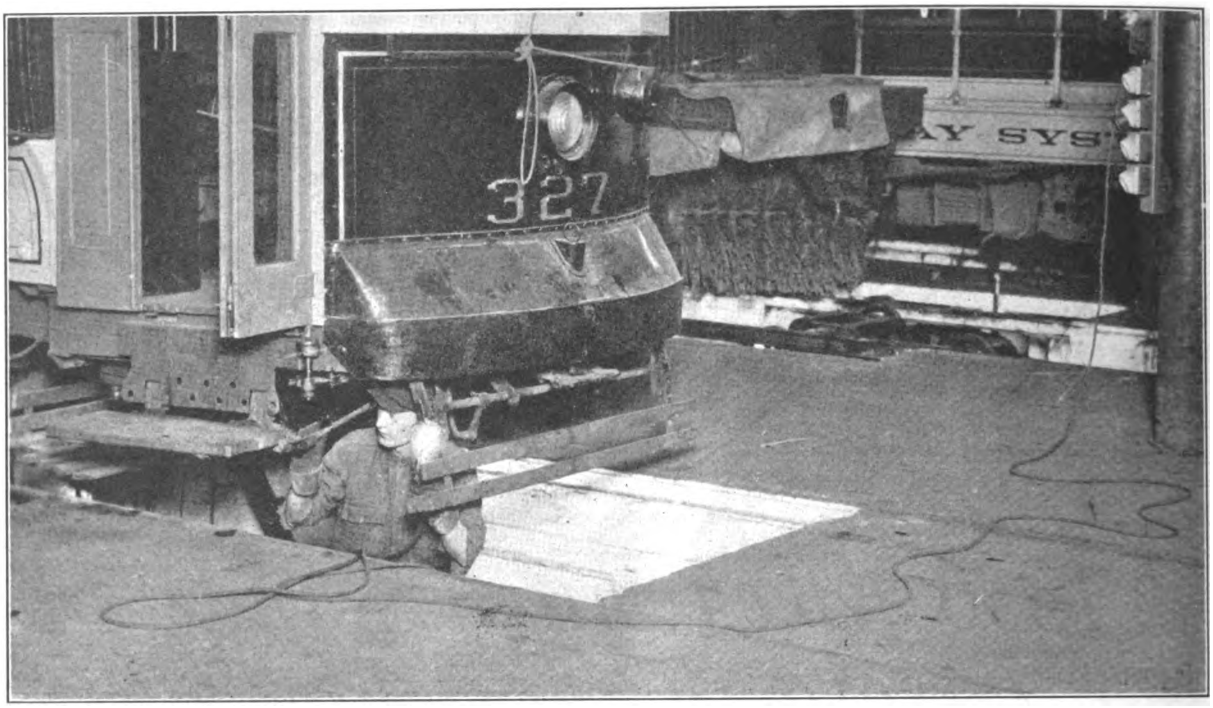
As an emergency device the N-L Mechanical Sander used with a hand brake is a real life saver. It is the only combination that can prevent cars from running away when air is lost. As an economical device in regular service N-L Mechanical Sanders prevent the motorman from misapplying his control apparatus, starting the emergency flow of sand and flooding the track with it. N-L Mechanical Sanders apply all the sand you *need* but *no more.* Your cars don't come back empty every night.

The service other Electric Railways have secured thru the use of N-L Mechanical Sanders can be duplicated on your property.

Write today for complete data—without cost or obligation.

***The* NICHOLS-LINTERN CO.**
8404 Lorain Avenue, Cleveland, Ohio

N-L INDICATING SIGNALS
MECHANICAL SANDERS



DURADUCT and DURACORD

These two types of electric cable have the quality that their names attempt to imply—DURABILITY. They are built to endure the extremely hard usage of electric railway service, both in car wiring and in shop work.

For Car Wiring—85% Lighter than Metallic Conduit

Iron conduit is no longer a necessity—it is just another overweight luxury to drag around.

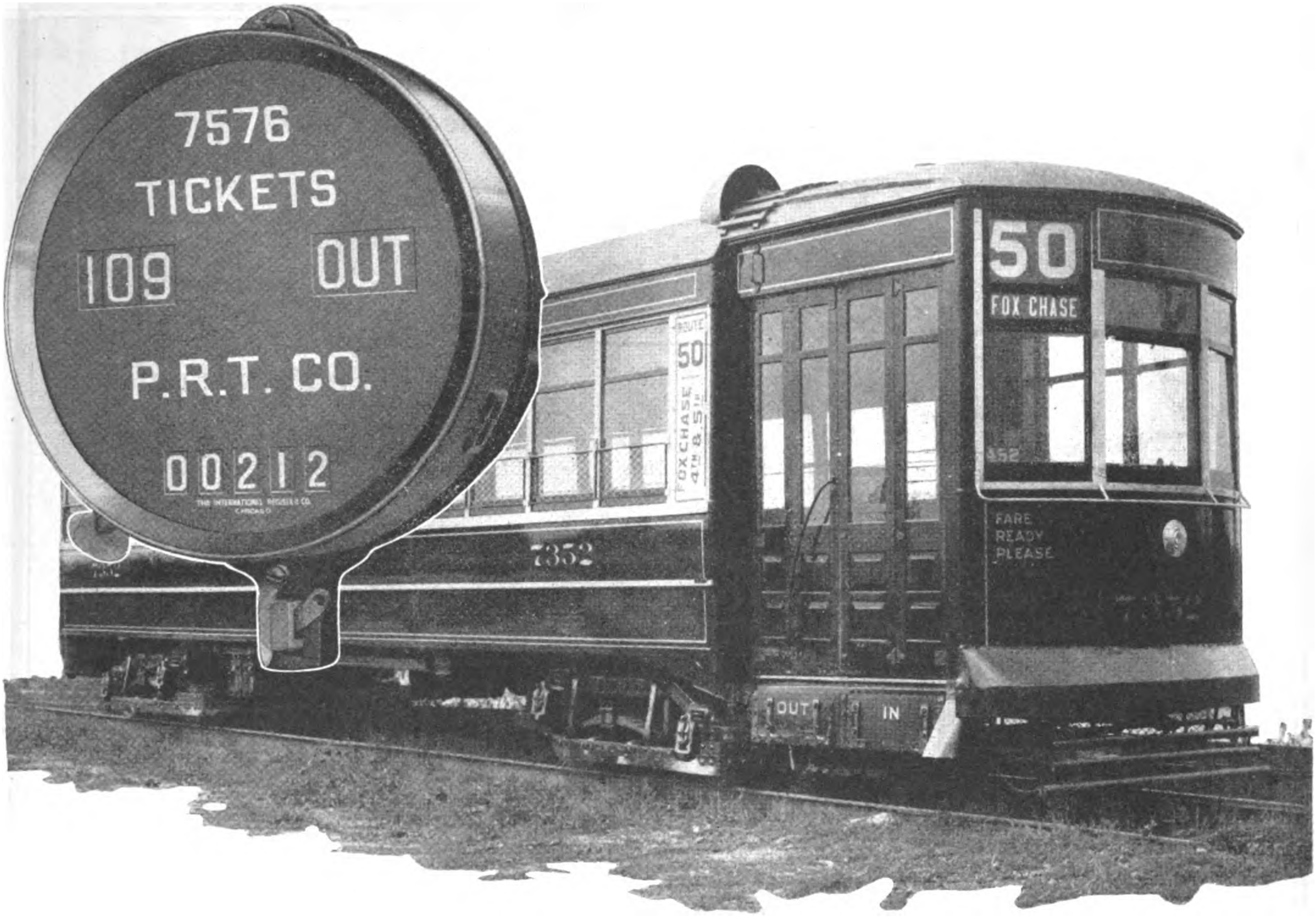
Notice the increasing number of new car orders specifying DURADUCT wiring. The following representative case illustrates why. One of the best-known large city cars built several years ago had all metal conduit wiring weighing 569 lb. If built today, with DURADUCT substituted in exactly the same layout, the weight would be 62.6 lb., a saving of 506.4 lb., or 89%. Other examples range from 85% to 90% saving in weight.

Is not such a saving worth while on your safety car equipment, when light weight is a controlling factor? Specify durable, waterproof and flame-resisting DURADUCT.

For Portable Lamps and Tools—Extreme Flexibility

Dragged across the car-house floor, kinked, trampled underfoot and yanked around generally, DURACORD is built to stand the worst abuse that can be heaped upon a portable cord. It lasts!

TUBULAR WOVEN FABRIC CO., Pawtucket, R. I.



2654 International Registers for the Philadelphia Rapid Transit Co.

Back in 1901 and 1902 the Philadelphia System bought their first International Registers, 350 of the standard type R-7. In 1908 and 1909 the system was completely equipped with the same type of register by a repeat order for 2200 registers. Since then additional orders have brought the total to over 2900 International R-7 registers.

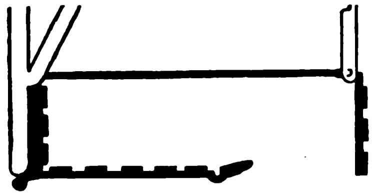
Installation of a ticket fare on this property made necessary the installation of an additional register. The superior service given through many years by the International Type R-7 Register on this road was such that an immediate decision was made to use this register, resulting in the order for 2654 which brings the total of these registers in use on this system to over 5500.

With the new fare collection system, one register will be used for cash fares. The first registers, built in 1901 and 02, are many of them still in service and have proved entirely satisfactory. Duplication of the entire present equipment by the addition of over 2600 International Registers of the same type is the best possible testimonial of the satisfactory service rendered by International equipment.

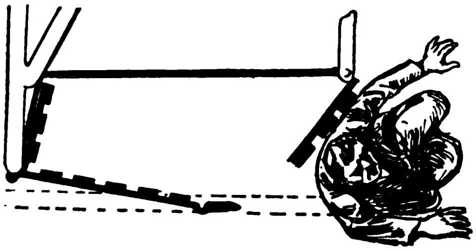
Besides the type R-7 used in Philadelphia, we manufacture single and double registers, counters, and car register fittings for all requirements of street railway and city systems.

Exclusive selling agents for
HERREN ENAMEL BADGES

The International Register Co., 15 South Throop Street, Chicago



This mechanically sensitive "feeler"



Acts instantly and automatically

That's why practically all users of safety cars, now consider that they are not truly safety cars until equipped with

H-B LIFE GUARDS

Along with the automatic devices to protect the passengers on the car, you need an automatic fender, which functions independently of the car operator at any and all times, to protect the people who are outside the car.

Making
the Safety Car
Safer
by Installing
H-B Life Guards

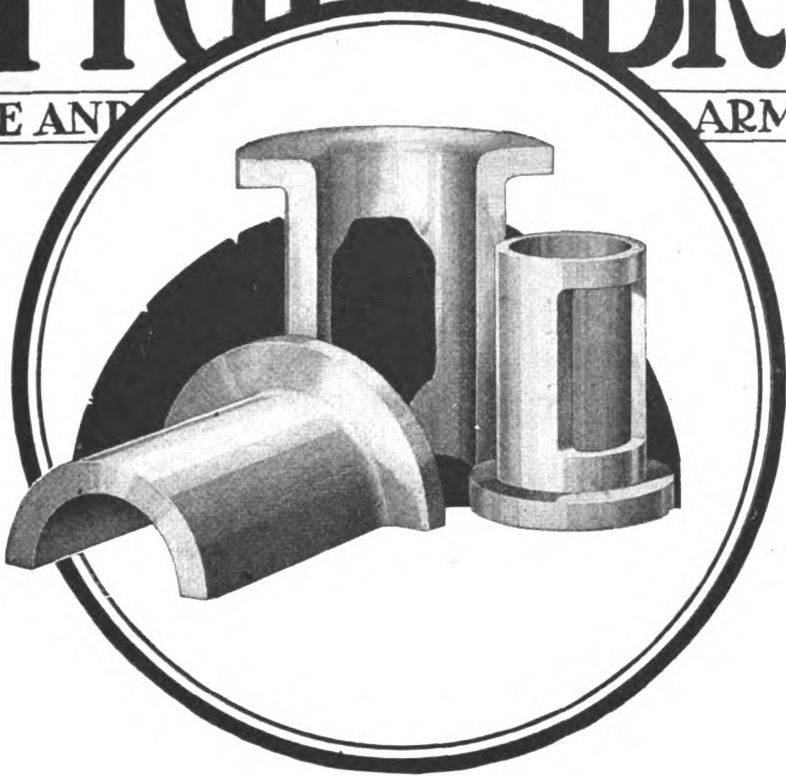
The Consolidated Car Fender Co., Providence, R. I.

General Sales Agent

Wendell & MacDuffie Co., 61 Broadway, N. Y.

"TIGER" BRONZE

AXLE AND ARMATURE BEARINGS



It will pay you to investigate the money saving possibilities of Tiger Bronze Bearings and to learn more about the engineering service that goes with them. Write today for details.

Better Service means lower ultimate cost

Buyers of electric railway equipment have learned that low first cost usually means high ultimate cost—and *ultimate* cost is the only true measure of economy.

Take armature bearings for example. The use of low cost, low quality bearings is bound to result in the constant laying up of cars for bearing renewals and for the rewinding of armature coils. High quality bearings eliminate all this expense and save the revenue that's lost while the cars are out of service.

More-Jones "Tiger" Bronze Axle and Armature Bearings are *high quality* bearings. Every day they are helping to reduce maintenance costs on some of the most progressive electric railroads in the country.

MORE-JONES BRASS & METAL CO.
St. Louis, Mo.

TROLLEY WHEELS:
V-K *Oilless.* M.J. *Lubricated*
HARPS: V-K *Non-Arcing*
BEARINGS: *"Tiger" Bronze Axle and Armature*
ARMATURE BABBITT
and Similar Products

MORE-JONES

"STANDARD"

Steel Tires

Steel Tired Wheels

Solid Rolled Steel Wheels

O. H. Steel and Malleable Iron Castings

Solid Forged Gear Blanks

Steel Forgings Iron Forgings

Forged and Rolled Steel

Pipe Flanges

Ring Dies

Rings

Roll Shells Steel Springs

S BRAND *"The 'Standard' Brand on your material is an assurance of eventual economy."* S BRAND

STANDARD STEEL WORKS CO.

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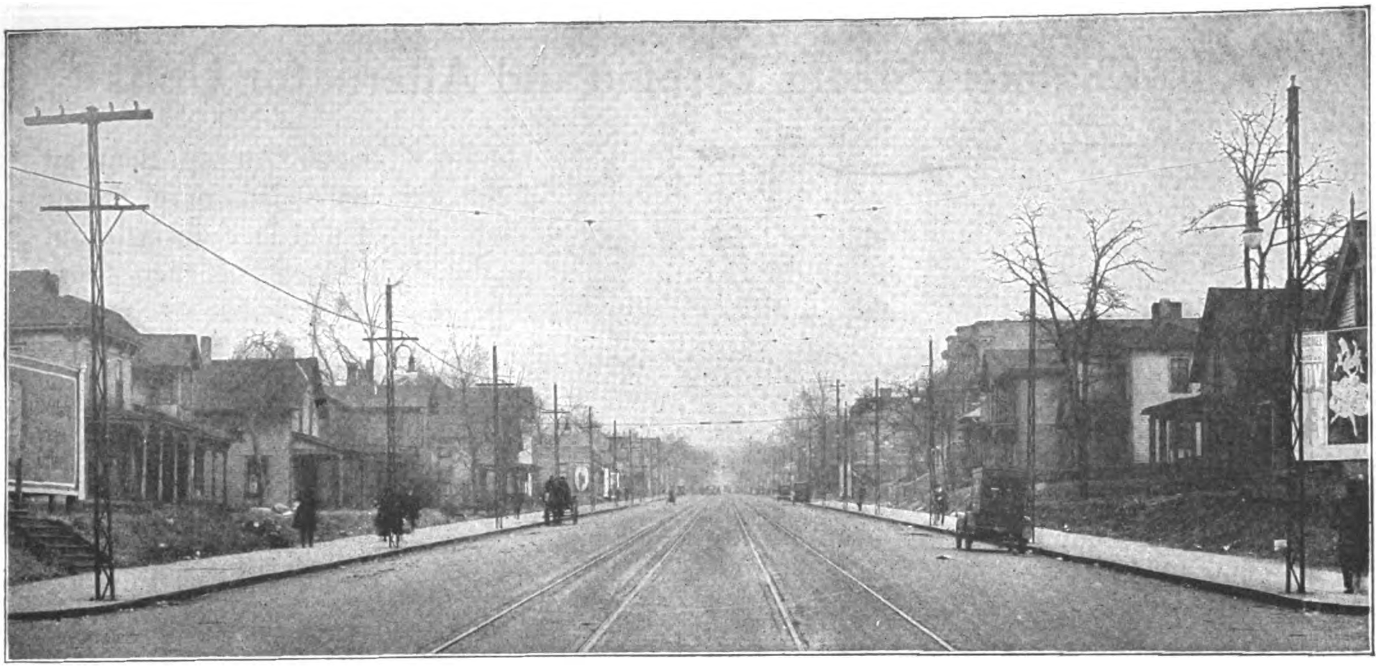


Bates One-Piece Steel Poles with Ornamental Lighting

This installation illustrates one of the possibilities of combining Artistic Bates Poles with ornamental lighting units. The excessive number of poles required where trolley conductors and lighting units are installed on separate poles is not only decidedly inartistic, but is also a needless waste of good material. Of course, it is necessary that an artistic steel pole be used for such a combination of purposes.

The series lighting conductor is run from pole top to pole top eliminating the use of expensive, troublesome underground cable.

The use of Bates Permanent Steel Poles with ornamental lights represents maximum economy and the utmost in art.

Bates Expanded Steel Truss Co.

**208 South La Salle Street
CHICAGO, ILLINOIS**

CHEATHAM

Here is what a Railway in the State of Washington has to say about the "CHEATHAM SWITCH" when used in connection with

SAFETY OR ONE-MAN CARS

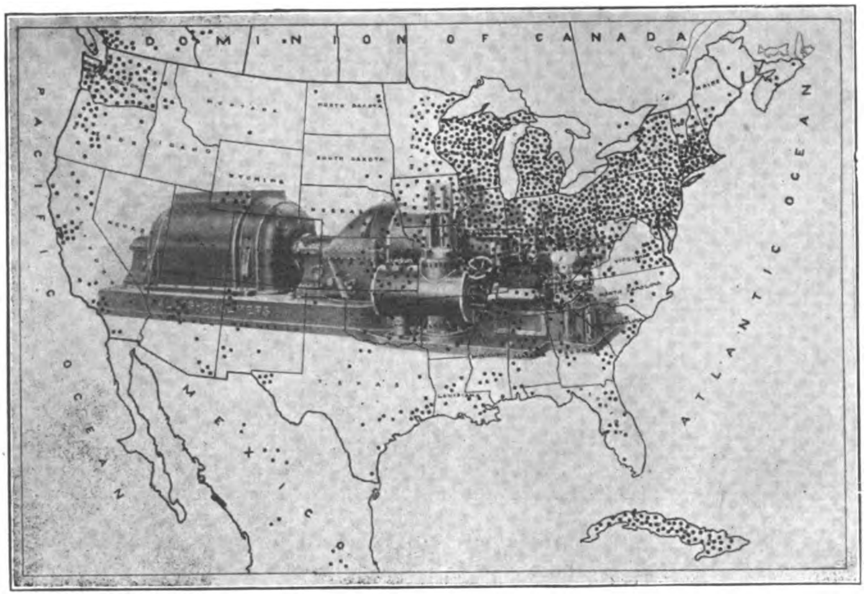
"Relying to your letter, wish to state that we are very much pleased with the CHEATHAM ELECTRIC SWITCHES recently installed. The switches have worked to our satisfaction and have contributed materially in the matter of keeping up schedules, particularly with the one-man cars."

SWITCH

Write

**Cheatham Electric Switching Device Co.
4780 Ashbottom Rd., Louisville, Ky.**

Allis-Chalmers Steam Turbine and Alternator Units



Each Dot represents an Allis-Chalmers Steam Turbine installation and a satisfied customer.

Satisfied customers are possible only through efficient and uninterrupted service.

Allis-Chalmers Steam Turbines are highly efficient, rugged in construction, built for continuous service.

ALLIS-CHALMERS
MILWAUKEE, WIS. U. S. A.

ALLIS-CHALMERS A-C MILWAUKEE

Keep this line A-MOVING

Passengers held up in the line while someone ahead waits for change will appreciate the more rapid loading when you install a ticket fare system. And you can appreciate yourself what the speeding up of operation will mean to your Company.

GLOBE TICKETS

Designing tickets and transfers has been our business for nearly forty years. Our experience in solving all kinds of ticket problems is at your service. Tickets in convenient strips, rolls or books designed to meet your special conditions whatever they may be. Our P.M. coupon transfer is a positive preventative of those all-day stop-overs. It is also a timesaver. Where every motion counts, elimination of even one punching on every transfer adds up to valuable minutes in the day's work.

GLOBE TICKET COMPANY
112-114 N. 12th St., Philadelphia, Pa.

"Tool Steel" gears
In severest test,
For thirteen years
Have proven best.

Don't Be Satisfied

The world owes its advance to healthy dissatisfaction. Man, not contented with conditions, has striven constantly and still strives to improve these conditions, which has resulted in the wonderful devices, machinery and equipment we have today and will result in the more wonderful devices still to come.

Carnegie Steel Company has constantly endeavored to improve, wherever possible, its methods of manufacture. As a result

Carnegie Steel Gear Blanks

today are manufactured under conditions that make possible the highest quality of product. Every step in their manufacture, from quarry to finished product, is under the careful supervision of experts.

Don't be satisfied with less than the best. Gears cut from Carnegie Blanks will outwear ordinary cast steel gears three or four times. On your next order of gears from your gear cutter, it will pay you to

Specify Carnegie Blanks

Carnegie Steel Company
General Offices: Carnegie Building, Pittsburgh, Pa.

1426

564-BP-417
EVERY
NUTTALL
GEAR
IS
REGISTERED

Heat Treated Gears

The Nuttall Guarantee

We guarantee the material we furnish to be of high grade, free from defects liable to affect the strength of finished work; also, that all machining will be accurate and the finished product in accordance with the specifications.

We will replace any gears developing serious defects in material or not correctly machined.

It is impossible to guarantee gears in terms of specific life, because we have no control over the conditions upon which the life of a gear depends after installation, such as lubrication, protection from grit, correct alignment and centering of shafts.

We do, however, guarantee the life of Nuttall Heat Treated Steel Gearing to exceed the life of untreated, medium carbon cast steel gearing in identical service, as shown by the following ratios

Basis of Comparison:

CS—Standard Cast Steel................ 100
BP—Special Process........................ 400
NP—Special Process Cast Steel.... 300

We will replace any gears not fulfilling this guarantee, subject to an adjustment based upon the percentage of actual to guaranteed life.

**All Westinghouse Electric & Mfg. Co.
District Offices are Sales Representatives
in the United States for Nuttall Electric Railway
and Mine Haulage Products**

**R.D.NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA**

Nuttall

Buy Now - Save Now
Safety Car Prices are Lower

Buy now and save from the start—Speed up schedules and increase earnings—Make your net help pay first cost—Others do it—You can—We'll convince you—Inquire!

St. Louis Car Company
St. Louis, Mo.
"The Birthplace of the Safety Car"

AMELECTRIC PRODUCTS

American Electrical Works · Amelectric · Wires and Cables · Phillipsdale, R.I.

Reg. U. S. Pat. Office

BARE COPPER WIRE AND CABLE

TROLLEY WIRE

WEATHERPROOF WIRE AND CABLE

PAPER INSULATED UNDERGROUND CABLE

MAGNET WIRE

Galvanized Iron and Steel Wire and Strand

Incandescent Lamp Cord

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 112 W. Adams; Cincinnati, Traction Bldg.; New York, 233 B'way; San Francisco, 612 Howard; Seattle, 100 1st Ave. So.

U. S. Electric Contact Signals
for

Single-track block-signal protection
Double-track spacing and clearance signals
Protection at intersections with wyes
Proceed signals in street reconstruction work

U.S. Electric Signal Co. West Newton, Mass.

United States Electric Signal Co.
West Newton, Mass.

COPPER CLAD STEEL COMPANY

OFFICE AND WORKS:
RANKIN, PA. BRADDOCK P. O.

ARISTOS COPPERWELD

WESTERN SALES REPRESENTATIVES:
STEEL SALES CORPORATION, CHICAGO, ILL.

NEW YORK SALES OFFICE: 30 CHURCH STREET, NEW YORK CITY

COPPERWELD Wire—*made by the Molten Welding Process*
Bare—Weatherproof—Strand.

AETNA INSULATION LINE MATERIAL

Third Rail Insulators, Trolley Bases, Harps and Wheels, Bronze and Malleable Iron Frogs, Crossings, Section Insulators, Section Switches.

Albert & J. M. Anderson Mfg. Co.
289-93 A Street, Boston, Mass.
Established 1877
Branches—New York, 135 B'way, Philadelphia, 429 Real Estate Trust Bldg. Chicago, 105 So. Dearborn St. London, 48 Milton Street

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ANACONDA
Copper Wire
111 W. Washington St., Chicago

ROEBLING

Electrical Wires and Cables

JOHN A. ROEBLING'S SONS CO., Trenton, N. J.

Protect Your Highway Crossings

with Nachod Highway Crossing Signals. They prevent damage suits, and let you sleep easier at night. Furnished with bell, wig wag and flashing lights, independently operated. Also singly, or in any combination.

NACHOD SIGNALS

for highway crossings are described in Catalog 720. They are operated from trolley power by high speed overhead trolley contactors without moving parts. Our Catalog 719 tells about Nachod Block Signals; and the Manual about the Automatic Headway Recorder for timing cars.

NACHOD SIGNAL CO., INC.
LOUISVILLE, KENTUCKY

Chapman
Automatic Signals
Charles N. Wood Co., Boston

"NATIONAL" BULLETIN

Ask for "NATIONAL" Bulletin No. 14—

"NATIONAL"
TUBULAR STEEL POLES

—free, on request, to electric traction engineers

NATIONAL TUBE COMPANY PITTSBURGH, PA.

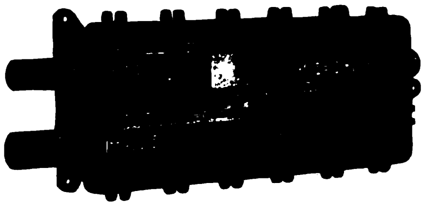
BENNETT-FIELD CROSS TIE CO.
FISHER BLDG., CHICAGO
"The Shippin' Fools"
RAILROAD TIES, SWITCH TIES and CROSSING PLANK

LUMBER

FIR

Specialists in Street Railway Requirements
Write for List

TIES—TIMBERS—POLES—PILING
DUNCAN LUMBER COMPANY, Portland, Oregon



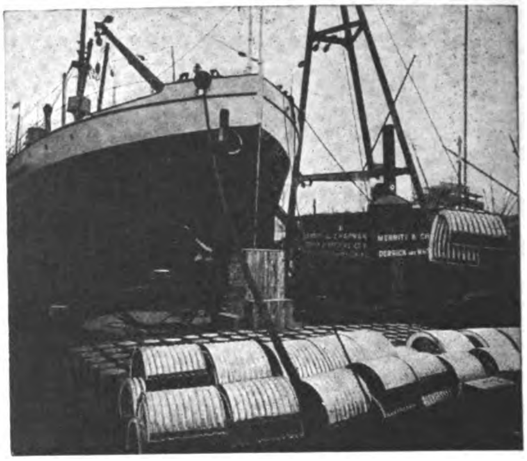
Manhole Junction Box for Underground Feeder Circuit.

THE installation, operation and maintenance of underground cable systems is greatly simplified by the use of STANDARD junction boxes. The illustration shows a specially designed box for trolley feeder service which makes possible the disconnecting and sectionalizing of the different parts of the circuit while alive by simply opening one or more quick-break knife switches. This box is easily and quickly connected with the cable by wiped joints. It is perfectly waterproof when installed.

STANDARD Underground Cable Co.
Pittsburgh, Pa.

Boston
New York
Philadelphia
Washington
Atlanta
Detroit
Kansas City
Chicago
Salt Lake City
Minneapolis
St. Louis
San Francisco
Seattle
Los Angeles

For Canada: Standard Underground Cable Co. of Canada, Limited, Hamilton, Ont.



"ACME" (NESTABLE) TONCAN CORRUGATED METAL CULVERTS

At the N. Y. docks foreign bound steamers often take shipments of "ACMES" and leave other freight behind. They do this because "ACMES" are not bulky. Made in 2 ft. upper and lower sections they are shipped nested. Here in the U. S. this point is of great value as it means lower shipping costs and often quicker deliveries. Write for catalog M-21.

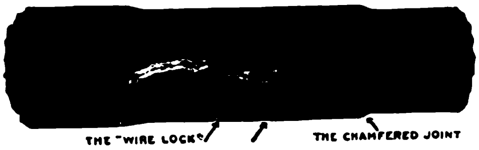
THE CANTON CULVERT & SILO CO.
MANUFACTURERS
CANTON OHIO U.S.A.

High-Grade Track Work

SWITCHES—MATES—FROGS—CROSSINGS
COMPLETE LAYOUTS
IMPROVED ANTI-KICK BIG-HEEL SWITCHES
HARD CENTER AND MANGANESE CONSTRUCTION

New York Switch & Crossing Co.
Hoboken, N. J.

ELRECO TUBULAR POLES



COMBINE

Lowest Cost **Lightest Weight**
Least Maintenance **Greatest Adaptability**

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO
New York City, 30 Church Street

SPECIAL TRACKWORK
Of the well-known WHARTON Superior Designs and Constructions

STEEL CASTINGS
CONVERTER AND ELECTRIC

FORGINGS
DROP, HAMMER AND PRESS

GAS CYLINDERS
SEAMLESS STEEL

WM. WHARTON JR. & CO., Inc., Easton, Pa.
(Subsidiary of Taylor-Wharton Iron & Steel Co., High Bridge, N. J.)

ORIGINATORS OF
MANGANESE STEEL IN TRACKWORK

Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

ARCHBOLD-BRADY CO.
Engineers and Contractors SYRACUSE, N. Y.

Peirce Forged Steel Pins with Drawn Separable Thimbles

Your best insurance against insulator breakage

Hubbard & Company
PITTSBURGH, PA.

IN 1898

STEAM SUPERHEATERS

Were introduced commercially in the United States by this Company. Owners of boilers it has built—Babcock & Wilcox, Stirling and Rust—not now equipped with these coal-saving accessories can obtain information about superheating possibilities from the nearest office listed below.

THE BABCOCK & WILCOX COMPANY
85 LIBERTY STREET, NEW YORK

BOSTON, 49 Federal Street
PHILADELPHIA, North American Bldg.
PITTSBURGH, Farmers Deposit Bank Bldg.
CLEVELAND, Guardian Bldg.
CHICAGO, Marquette Building
CINCINNATI, Traction Bldg.

ATLANTA, Candler Bldg.
TUCSON, ARIZ., 21 So. Stone Avenue
NEW ORLEANS, 533 Baronne Street
DENVER, 435 Seventeenth Street
SALT LAKE CITY, 705-6 Kearns Bldg.
HONOLULU, H. I., Castle & Cooke Bldg.

SAN FRANCISCO, Sheldon Bldg.
LOS ANGELES, 404-406 Central Bldg.
SEATTLE, L. C. Smith Bldg.
HAVANA, CUBA, Calle de Aguiar 104
HOUSTON, TEXAS, Southern Pacific Bldg.
SAN JUAN, PORTO RICO, Royal Bank Bldg.

ERICO
ECONOMICAL
EFFICIENT
RAIL BONDS

THE ELECTRIC RAILWAY IMPROVEMENT CO.
CLEVELAND, OHIO

BARBOUR-STOCKWELL CO.
205 Broadway, Cambridgeport, Mass.
Established 1858

Manufacturers of
Special Work for Street Railways
Frogs, Crossings, Switches and Mates
Turnouts and Cross Connections
Kerwin Portable Crossovers
Balkwill Articulated Cast Manganese Crossings

ESTIMATES PROMPTLY FURNISHED

NILES-BEMENT-POND CO.
111 BROADWAY, NEW YORK

MACHINE TOOLS
FOR ELECTRIC RAILWAYS

Axle Lathes
Wheel Presses
Car Wheel Lathes
Boring Mills
Lathes
Hammers
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WE-FU-GO AND SCAIFE
WATER
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

THE CUTTER ELECTRICAL AND MANUFACTURING CO.
CIRCUIT BREAKERS
PHILADELPHIA

I. T. E.
Circuit Breakers

for heavy street railway work are the best obtainable. Write for New Complete Catalogue.

SPECIFY
THE TERRY TURBINE
For Driving Your Auxiliaries
TERRY STEAM TURBINE CO.
Hartford, Conn.

BAKELITE-DILECTO

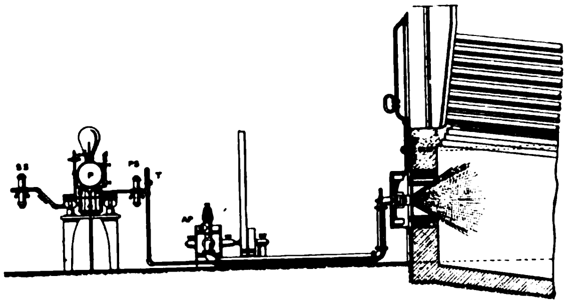
The fields of usefulness for Bakelite-Dilecto are many and varied because of its superior merit over materials heretofore available in sheets, tubes or rods. The exceptional qualities of Bakelite-Dilecto are satisfying electric railways all over the country. Investigate.

The Continental Fibre Co., Newark, Delaware
Branch Offices:
CHICAGO, 332 S. Michigan Ave.
NEW YORK, 233 Broadway
Pittsburgh Office, 301 Fifth Ave.
San Francisco Office, 525 Market St.
Los Angeles Office, 411 S. Main St.
Canadian Office, 1710 Royal Bank Bldg.,
Cor. King and Yonge Sts.
Toronto, Ont.,

FOSTER SUPERHEATERS

A necessity for turbine protection, engine cylinder economy and utilization of superheat for all its benefits

Power Specialty Company Boston Chicago Philadelphia San Francisco Pittsburgh London, Eng. 111 Broadway, New York



KOERTING
FUEL OIL BURNING SYSTEM

Over 1,000,000 h.p. equipped with this system, which is superior to the air or steam atomizing system in regard to economy.

Ask for Catalog 6-O.

SCHUTTE & KOERTING CO.
1155 Thompson Street
Philadelphia, Pa.

HIGH SPEED MONEY CHANGERS

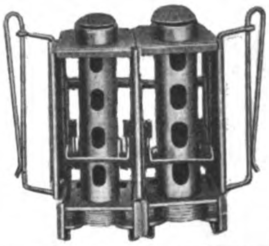
The new 1921 model —without rivets— ready for delivery

Supplied in one or four tube combinations

Essential wherever the rapid and accurate handling of change is required. Now included in the standard equipment of largest Traction Companies because conductors demand them. Prices and literature sent on request.

J. L. GALEF, 75 Chambers St., New York City
Exclusive Manufacturers' Selling Agent

JOHNSON Universal Changer



Adjustable

The only changer on the market which can be adjusted by the conductor to throw out a varying number of coins, necessary to meet changes in rates of fares.

Flexible

Each barrel a separate unit, permitting the conductor to interchange the barrels, to suit his personal requirements and to facilitate the addition of extra barrels.

JOHNSON FARE BOX COMPANY
Ravenswood, Chicago, Ill.

A Wrench That IS a Wrench

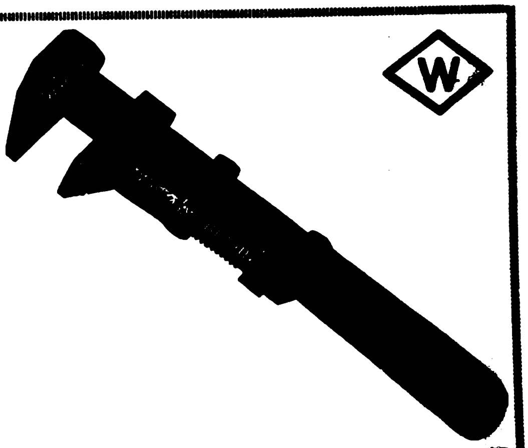
The strongest and most durable heavy-duty screw wrench made—The W & B "Railroad Special." Head and bar drop-forged in one piece; jaw extra heavy and thoroughly casehardened. Fitted with indestructible iron handle and easy-acting solid steel screw.

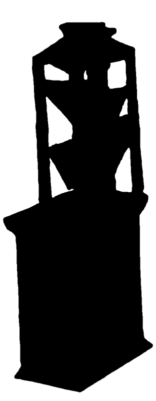
Seven sizes, from 6 to 21 in.; maximum capacity of opening, 3 15/16 in. Guaranteed.

Screw Wrench Book on Request.

J. H. WILLIAMS & CO.
"The Wrench People"

BROOKLYN 143 Richards St.
BUFFALO 143 Vulcan St.
CHICAGO 1143 W. 120th St.





CLEVELAND FARE BOXES

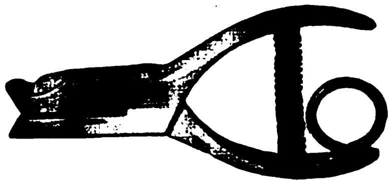
reduce fare collection to its simplest form—the practical fare box for *One Man Car* operation.

The Cleveland Fare Box Company
CLEVELAND, OHIO

Canadian Cleveland Fare Box Co., Ltd.
Preston, Ontario

Use them in your terminals—
PEREY TURNSTILES or PASSIMETERS
Faster than the ticket seller

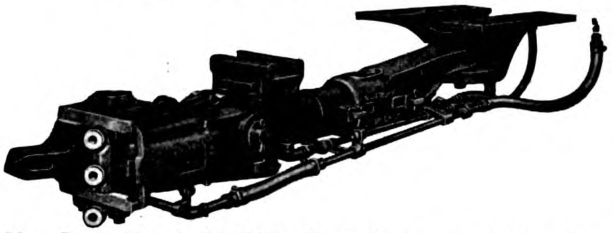
Perey Manufacturing Co., Inc.
30 Church Street, New York City



Economical in the Long Run

BONNEY-VEHSLAGE TOOL CO.
Newark, N. J.

Van Dorn Car-Air-Electric Couplers for Rapid Transit Service



Van Dorn No. 1450 Tight-Lock Car-and-Air Coupler

Van Dorn Car-Air-Electric Couplers represent the last word in coupling equipment for modern rapid transit service.

A delay in making up trains, under little headway, to care for the peak load, results in heavy losses. Van Dorn equipment which effects, simultaneously, a safe, unyielding coupling of cars, air lines and electric circuits, minimizes these losses.

The positive tight-locking and "take-up" devices of the coupler head, the unlocking eccentric and the "tell-tale" safety devices are among the many distinctive and up-to-the-minute features of Van Dorn Couplers.

Let us tell you more about the utility, economy, and reliability of Van Dorn Car-Air-Electric Couplers for your motor-trailer or multiple-car rapid-transit lines.

Van Dorn Coupler Company
2325 So. Paulina St., Chicago, Ill.

"LE CARBONE"
CARBON BRUSHES

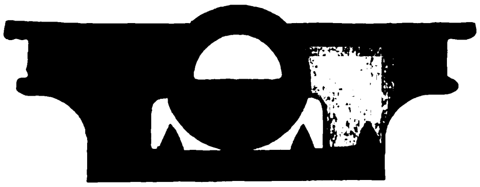
They are uniform in quality

They talk for themselves

W. J. Jeandron
227 Fulton Street
New York City

Pittsburgh Office:
636 Wabash Building

Canadian Distributors:
Lyman Tube & Supply Co., Ltd.
Montreal and Toronto



STUCKI SIDE BEARINGS

A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.

FORD TRIBLOC

A Chain Hoist that excels in every feature. It has Planetary Gears, Steel Parts, 3½ to 1 factor of Safety. It's the only Block that carries a five-year guarantee.

FORD CHAIN BLOCK CO.
Second and Diamond Sts., Philadelphia

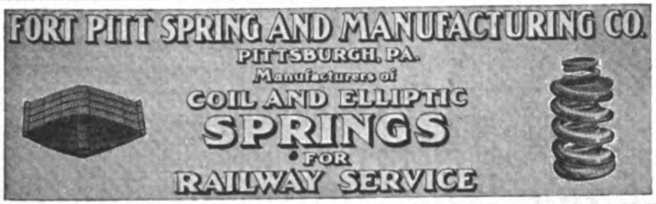
THE DIFFERENTIAL STEEL CAR CO.

H. Fort Flowers, Pres. & Gen. Mgr.
FINDLAY, OHIO

HORNE MANUFACTURING CO.

Mercer and Colgate Streets, Jersey City, N. J.

Hand Brakes—Air Purifiers for Compressors—Lighting Fixtures—Electric Vibrating Bells—Thermostats—Switches, Receptacles and Plugs—Junction Boxes, Portables and Reflectors.



FORT PITT SPRING AND MANUFACTURING CO.
PITTSBURGH, PA.
Manufacturers of
COIL AND ELLIPTIC
SPRINGS
FOR
RAILWAY SERVICE

Electric car heaters—thermostatic control—pneumatic car door operators—buzzers, single-stroke bells, starting signal lights—special resistances.

CONSOLIDATED CAR HEATING CO.

ALBANY, NEW YORK, CHICAGO

"Boyerized" Products Reduce Maintenance

Bemis Trucks	Manganese Brake Heads
Case Hardened Brake Pins	Manganese Transom Plates
Case Hardened Bushings	Manganese Body Bushings
Case Hardened Nuts and Bolts	Bronze Axle Bearings

Bemis Pins are absolutely smooth and true in diameter. We carry 40 different sizes of case hardened pins in stock. Samples furnished. Write for full data.

Bemis Car Truck Co., Springfield, Mass.

SAMSON SPOT WATERPROOFED TROLLEY CORD

Trade Mark Reg. U. S. Pat. Off.

Made of extra quality stock firmly braided and smoothly finished. Carefully inspected and guaranteed free from flaws. Samples and information gladly sent.

SAMSON CORDAGE WORKS, BOSTON, MASS.

POSITIONS VACANT

CHIEF draftsman for street car building plant. Must be experienced in street car work and capable of taking charge of small drafting room. Designing ability and experience especially desired. State age, record, salary expected. P-913, Elec Ry. Journal.

MAN wanted who can repair armatures, cars and do general shop work. A good position for the right man. P-916, Elec. Ry. Journal, Old Colony Bldg., Chicago.

POSITIONS WANTED

CAPABLE technical man of proven executive ability, now employed, seeks opportunity in responsible position where initiative and dependability count and are valued; 19 years' experience in electric railway field; 16 years as executive in charge; thoroughly competent in the design, maintenance and operation of equipment; successful in handling men; experienced in effecting operating economies PW-910, Elec. Ry. Journal, Real Estate Trust Bldg., Phila.

CAR builder, 14 years' experience as foreman in car construction and repairing. Can handle men and install efficiency methods for obtaining maximum production at minimum cost. PW-908, Elec. Ry. Journal, Old Colony Bldg., Chicago.

ENGINEER, executive, electric railway and public service, construction, operation, maintenance; available immediately. Carl H. Fuller, 305 Elm Street, Youngstown, Ohio.

FOREMAN—14 years' experience in car construction and repairing. Can handle men and cut your upkeep cost. PW-914, Elec. Ry. Journal, Old Colony Bldg., Chicago.

MANAGER now employed desires to make a change. More than 20 years of actual railway experience in all branches, including 15 years in the claim department as chief executive Is alive, willing to work, capable of handling big propositions. Would accept position in either claim or transportation department. Best of references furnished. PW-912, Elec. Railway Journ.

SALES engineer with broad acquaintance in electric railway and mining field and formerly superintendent of equipment of large road desires to make permanent connection with a firm requiring the services of a man who can produce results. Will accept any territory. PW-915, Elec. Ry. Journal, Old Colony Bldg., Chicago.

SITUATION wanted as manager of railway or gas properties, preferably in the South. Have managed one of the largest combined street railway, gas and electric properties in the South for the past three years. Can furnish best referencs. PW-900, Elec., Ry. Journal, Real Estate Trust Bldg., Philadelphia.

SUPERINTENDENT, 17 years' experience in all phases of transportation, traffic and equipment in northern Ohio; very satisfactory relations with present employers; personal reasons for considering change of location; age 37, married; excellent references as to character and ability. PW-901. Elec. Ry. Journal, Leader-News Bldg., Cleveland.

SUPERINTENDENT of transportation with nearly 18 years' experience on large city, suburban and interurban properties desires making a change in near future; successful in dealing with public and employees. I would prefer a property that requires hard work, effort and ability to bring about results. Best of references as to character and ability. PW-904, Elec. Ry. Journal, Old Colony Bldg., Chicago.

WANTED

TWO CONTROLLERS

Used, but serviceable. Type K-34 preferred. Will buy or trade Four K-11 Controllers for them.

TIDE WATER POWER CO.
Wilmington, N. C.

VALUATION engineer, graduate E. E., University of Illinois. Completing valuation work for large public utility—street railway, gas, electric, water, ice and steam heat properties. Four and one-half years' experience, maintenance, construction, valuation in U. S. A. and abroad. PW-895, Elec. Ry. Journal, Old Colony Bldg., Chicago.

WE WANT

6—L-4

CONTROLLERS

16—GE-87B

MOTORS

Transit Equipment Co.
501 Fifth Avenue, New York

FOR SALE

Generating Unit

1—480-hp., 100-r.p.m., 150-lb. pressure Bates Corliss Engine direct connected to 325-kw. D.C. generator, 550-volt Westinghouse, 100-r.p.m. with panel.

Central Illinois Public Service Co.
D. R. Truax, Purchasing & Stores Agent
MATTOON, ILLINOIS

FOR SALE

8 ONE-MAN STREET CARS

These are single truck cars—31 feet long—complete with motors for 650 V. operation. Hand brakes and manually operated doors. Have just been released from service in a city of 38,000 population.

A BARGAIN

Waterloo, Cedar Falls & Northern Railway
Waterloo, Iowa.

SUPERINTENDENT; present employed Middle West; will consider city or interurban property located in Eastern state. Married; age 35; technical training. Clean, progressive with proven ability to successfully deal with labor and public 14 years' experience. Best of references. PW-911, Elec. Railway Journ., Old Colony Bldg., Chicago.

For 20 Years

we have been
Buying and Selling

Second-Hand Cars

Trucks and Motors

At Your Service

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

FOR SALE—One second-hand

BUCKEYE ENGINE AND GENERATOR

In good condition, description as follows:

DYNAMO—300 kw.; Mfg. Special 18527; Fields 16; Full Load; Mfg. No. 44813 Armature; Speed 143; Volts 550; Amperes 545; 8 Poles; Winding—Compound; Commutator—Good condition; Brushes—carbon; Type Armature Winding—Form.

ENGINE—Mfg., Buckeye; Horiz. Engine; Mfg. No. 5306½; Generator on right; crank on left; Tandem; Diam. Cyl—12 H 20-L; Stroke 32 in.; Cyl.—not rebored; Shaft Diam.—(in wheel) 14 in.; (in armature) 14; Length—31 ft.; Wheel Diam. —11 ft.; Face 20; Sections 2; Exhaust 12 in.; Floor Space—16½ x 31 ft. 3 in.; Diam. Steam 6 in.; Weight—not known.

The Beaver Valley Traction Co.
New Brighton, Pa.

FOR SALE

TRANSFORMERS

1—Type H, Form RP, Cycles 60, 200 KVA., 19100/33000Y—2300 Oil Cooled, Step Up Transformer.

1—220 Volt (B) KW., 60 Cycle, Oil Cooled, Step Up Transformer. 19100/33000Y — 2300.

4—Type HS, Form RT, Cycles 60, 135 KVA., 17100/19100/33000Y — 370/370/185. Oil Cooled Step Down Transformers.

All filled with oil and in excellent shape.

UNION TRACTION CO.
Nashville, Tennessee

IN STOCK
for Immediate Shipment

Turbo Units, Rotary Converters, Transformers, Motor Generator Sets, Dynamos and Motors

ARCHER & BALDWIN, Inc.
114-118 Liberty St., New York City
Telephone 4337-8 Rector

20% NEW REPAIR PARTS 20%

G-E—67—58—57—52—1000

20% OFF CURRENT PRICES

G-E 1200-800, W-12A—SRG, WP30-50

20% OVER JUNK VALUE

Rewound Armatures and Fields for Above Motors
K, K-2, K-10, K-11, K-12, K14, K6, Controllers and Repair Parts

Send Us Your Inquiries

20% **EASTERN MASSACHUSETTS ST. RY. CO.** 20%
1 Beacon Street, Boston, Mass.

You can get

A Production Checker

at little cost

Here is an opportunity to get a *Productograph* to keep count and make curve chart record on one to twenty producing machines. From these records you know exactly the production you are actually getting from your machines. No guessing. It is in first class condition and various spare parts are included.

Bargain price for quick sale.

W. A. Hefner, care of McGraw-Hill Co.,
10th Ave. at 36th St., New York City

The Searchlight Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price, or an expert employee.

The Best Proof

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable *demand* for such machinery or services, by its readers, the market-place which these advertisements represent could not exist for any length of time.

Are *you* using the Searchlight Section?

0200

Notice to Advertisers!

Owing to the holiday, July 4th, the "Searchlight" pages of the July 2d issue will close for press a day earlier than usual. Copy for this issue should therefore reach us by

10 A.M., Tuesday June 28th

SEARCHLIGHT
SERVICE
SECURES
SATISFACTORY
SALES

2004

FOR SALE

15 International Fare Boxes

for registering dimes and nickels with separate locked compartment for pennies. Machines in perfect condition.

Fairmount Park Transit Co.
Station W., West Park, Philadelphia, Pa.

FOR SALE

Two Interurban Cars

in fine condition, one user very little as parlor car, two months in the year: Can put cross seats in this car. Cars have parlor, smoking and baggage compartment with toilet, hot water heat, GE-204 Motors, American Locomotive Trucks.

SOUTHERN NEW YORK POWER & RAILWAY CORPORATION
Hartwick, N. Y.

FOR SALE

500 tons 7 in. High 80 lb.

GIRDER RAILS

with Channel Plates—equal to new.
30 and 60 ft. lengths—will make low price.

Karasik, Friedman & Company, Inc.
Woolworth Bldg., New York

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Aftercoolers
Ingersoll-Rand Co.

Air Circuit Breakers
Condit Electrical Mfg. Co.

Air Receivers
Ingersoll-Rand Co.

Anchors, Guy
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Automobiles and Buses
Brill Co., The J. G.

Axles
Bemis Car Truck Co.
Cambria Steel Co.
Carnegie Steel Co.
St. Louis Car Co.

Axles, Car Wheel
Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Works Co.
Westinghouse Elec. & Mfg. Co.

Axle Straighteners
Columbia M. W. & M. I. Co.

Babbitt Metal
Ajax Metal Co.
More-Jones Brass & Metal Co.

Babbitting Devices
Columbia M. W. & M. I. Co.

Badges and Buttons
Electric Service Supplies Co.
International Register Co., The

Batteries, Dry
National Carbon Co., Inc.
Nichols-Lintern Co.

Batteries, Storage
Electric Storage Battery Co.

Bearings and Bearing Metals
Ajax Metal Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
General Electric Co.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse Elec. & Mfg. Co.

Bearings, Center and Roller Side
Stucki Co., A.

Bearings, Oilless, Graphite, Bronze and Wood
Bound Brook Oil-less Bearing Co.

Bells and Gongs
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Niles-Bement-Pond Co.

Boilers
Babcock & Wilcox Co.

Boiler Tubes
National Tube Co.

Bond Testers
American Steel & Wire Co.

Bonding Apparatus
American Steel & Wire Co.
Electric Ry. Improvement Co.
Electric Service Supplies Co.
Ohio Brass Co.

Bonds, Rail
American Steel & Wire Co.
Copper Clad Steel Co.
Electric Ry. Improvement Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Boring Tools, Car Wheel
Niles-Bement-Pond Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, Etc.)
American Bridge Co.
Bates Expanded Steel Truss Co.
Electric Railway Equipment Co.
Electric Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
National Ry. Appliance Co.
Westinghouse Traction Brake Co.

Brake Shoes
Amer. Brake Shoe & Fdry. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Brakes, Brake Systems and Brake Parts
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
General Electric Co.
Johns-Manville, Inc.
National Brake Co.
Safety Car Devices Co.
St. Louis Car Co.
Westinghouse Traction Brake Co.

Brass & Bronze Products
American Copper Products Corp.

Bridges and Buildings
American Bridge Co.

Brooms, Track, Steel or Rattan
American Rattan & Reed Mfg. Co.
Zelnicker, W. A., Supply Co., Inc.

Brushes, Carbon
Corliss Carbon Co.
General Electric Co.
Jeandron, W. J.
National Carbon Co., Inc.
United States Graphite Co.
Westinghouse Elec. & Mfg. Co.

Brush Holders
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.

Brushes, Graphite
National Carbon Co., Inc.

Bunkers, Coal
American Bridge Co.

Bus Bars
American Copper Products Corp.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.

Bushings, Graphite and Wooden
Bound Brook Oil-less Bearing Co.

Cables (See Wires and Cables)

Carbon Brushes (See Brushes, Carbon)

Car Panel Safety Switches
Westinghouse Elec. & Mfg. Co.

Cars, Dump
Differential Car Co.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cambria Steel Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Electric Storage Battery Co.
General Electric Co.

Castings, Brass, Composition or Copper
Ajax Metal Co.
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Eureka Co.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Standard Steel Works Co.
St. Louis Car Co.

Castings, Malleable and Brass
Amer. Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley
Ackley Brake & Supply Corp.
Electric Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Ceiling, Car
Pantasote Co.

Change Carriers
Galef, J. L.

Circuit Breakers
Cutter Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Clamps and Connectors for Wires and Cables
Anderson Mfg. Co., A. & J. M.
Electric Railway Equipment Co.
Electric Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Cleaners and Scrapers—Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets
General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding Machines
Columbia M. W. & M. I. Co.
Comstock Mfg. Co.
Electric Service Supplies Co.

Coils, Armature and Field
Cleveland Armature Works
Columbia M. W. & M. I. Co.
Comstock Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Coils, Choke and Kicking
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Coin-Counting Machines
Electric Service Supplies Co.
International Register Co., The
Johnson Fare Box Co.

Commutator Slotters
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Electrical Mfg. Co.
Cleveland Armature Works
Columbia M. W. & M. I. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Compressors, Air
Allis-Chalmers Mfg. Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Traction Brake Co.

Compressors, Gas
Ingersoll-Rand Co.

Condensers
Allis-Chalmers Mfg. Co.
General Electric Co.
Schutte & Koerting Co.
Westinghouse Elec. & Mfg. Co.

Conduit Fittings
Chicago Fuse Mfg. Co.

Connectors, Solderless
Frankel Connector Co.
Westinghouse Elec. & Mfg. Co.

Controller Fingers
Russell Mfg. Co.

Controllers or Parts
Allis-Chalmers Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.
Russell Mfg. Co.
Westinghouse Elec. & Mfg. Co.

Controller Regulators
Electric Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Converters, Rotary
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.
Allison & Co., J. E.

Conveying and Hoisting Machinery
American Bridge Co.
Columbia M. W. & M. I. Co.

Copper Products
American Copper Products Corp.

Copper Wire
Anaconda Copper Mining Co.
Copper Clad Steel Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Roebling's Sons Co., John A.
Samson Cordage Works

Cord Connectors and Couplers
Electric Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
Amer. Steel Foundries
Brill Co., The J. G.
Ohio Brass Co.
Van Dorn Coupler Co.
Westinghouse Traction Brake Co.

Cranes
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossing Signals (See Signals, Crossing)

Crossings, Frog and Switch
Wharton, Jr., & Co., Wm.

Crossings, Track (See Track, Special Work)

Crushers, Rock
Allis-Chalmers Mfg. Co.

Culverts
Canton Culvert & Silo Co.

Curtains and Curtain Fixtures
Brill Co., The J. G.
Electric Service Supplies Co.
Pantasote Co.
St. Louis Car Co.

Cutouts
Chicago Fuse Mfg. Co.
Johns-Manville, Inc.

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Archer & Baldwin
Cleveland Armature Works
Electric Equipment Co.
Foster Co., H. M.
Hyman Michaels Co.
Karasik, Friedman & Co., Inc.
Reading Engineering Co.
Transit Equipt. Co.

Derailing Devices (See also Track Work)
Wharton Jr., & Co., Wm.

Destination Signs
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

Detective Service
Wish Service, P. Edward

Dogs, Lathe
Williams & Co., J. H.

Door Operating Devices
Consolidated Car Heating Co.
National Pneumatic Co., Inc.
Safety Car Devices Co.

Doors and Door Fixtures
Brill Co., The J. G.
General Electric Co.

Doors, Folding Vestibule
National Pneumatic Co., Inc.

Draft Rigging (See Couplers)

Drills, Rock
Ingersoll-Rand Co.

Drills, Track
American Steel & Wire Co.
Electric Service Supplies Co.
Niles-Bement-Pond Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.
Zelnicker Supply Co., Inc., Walter A.

Electrically Operated Switches (Air or Oil)
Condit Electrical Mfg. Co.

Electrical Wires and Cables
American Electrical Works
American Steel & Wire Co.
Roebling's Sons Co., J. A.

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Allison & Co., J. R.
Archbold-Brady Co.
Arnold Co., The
Beeler, John
Clark & Co., Mgr., Corp., E. W.
Day & Zimmermann
Feustel, Robert M.
Ford, Bacon & Davis
Gould, L. E.
Hemphill & Wells
Holst, Englehardt W.
Horton, Barker & Wheeler
Jackson, Walter
Parsons, Klapp, Brinkerhoff & Douglas
Republic Engineers, Inc.
Richey, Albert S.
Sanderson & Porter
Smith & Co., C. E.
Stone & Webster
White Engineering Corp., The J. G.

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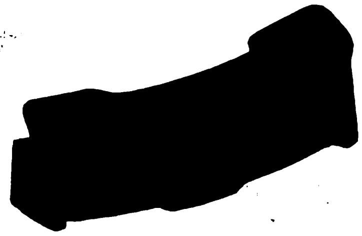

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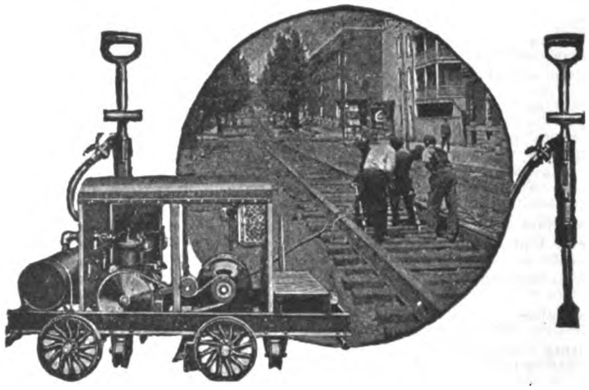

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Johnson Fare Box Co.
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Consolidated Car Fender Co.
Electric Service Supplies Co.

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Continental Fibre Co.
Johns-Manville, Inc.
Westinghouse Elec. & Mfg. Co.

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Scaife & Sons Co., Wm. B.

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Johns-Manville, Inc.

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Electric Service Supplies Co.

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Johns-Manville, Inc.

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American Abrasive Metals Co.

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Columbia M. W. & M. I. Co.
Standard Steel Works Co.
Williams & Co., J. H.

Frogs, Track (See Track Work)

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General Electric Co.
Johns-Manville, Inc.
Westinghouse Elec. & Mfg. Co.
Williams & Co., J. H.

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Chicago Fuse Mfg. Co.
Columbia M. W. & M. I. Co.
General Electric Co.

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Ohio Brass Co.

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Power Specialty Co.
Westinghouse Traction Brake Co.

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Westinghouse Elec. & Mfg. Co.

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Standard Steel Works Co.

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Westinghouse Elec. & Mfg. Co.

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More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Star Brass Works

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Ohio Brass Co.
St. Louis Car Co.

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Westinghouse Elec. & Mfg. Co.

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Electric Service Supplies Co.
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General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

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General Electric Co.
Westinghouse Elec. & Mfg. Co.

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General Electric Co.
Westinghouse Elec. & Mfg. Co.

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Ohio Brass Co.

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Williams & Co., J. H.

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Niles-Bement-Pond Co.

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General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

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Westinghouse Elec. & Mfg. Co.

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Hubbard & Co.

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Condit Electrical Mfg. Co.

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Oil Switches
Condit Electrical Mfg. Co.

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Westinghouse Elec. & Mfg. Co.

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National Ry. Appliance Co.

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Paving Material
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Ohio Brass Co.

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Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.

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Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.

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National Tube Co.

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Power Specialty Co.
Standard Steel Works Co.
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Electric Railway Equipment Co.
Hubbard & Co.

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Duncan Lumber Co.
Page & Hill Co.

Poles, Top Switches
Condit Electrical Mfg. Co.

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Anderson Mfg. Co., A. & J. M.
Bayonet Trolley Harp Co.
Columbia M. W. & M. I. Co.
Electric Service Suplies Co.
National Tube Co.
Nuttall Co., R. D.

Poles, Tubular Steel
Electric Railway Equipment Co.
National Tube Co.

Poles and Ties Treated
Bennett-Field Cross Tie Co.
Duncan Lumber Co.
Page & Hill Co.

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Economy Electric Devices Co.
National Ry. Appliance Co.

Pressure Regulators
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Pumps
Allis-Chalmers Mfg. Co.
Schutte & Koerting Co.

Punches, Ticket
Bonney-Vehslage Tool Co.
International Register Co., The
Wood Co., Chas. N.

Purifiers, Feed Water
Scaife & Sons Co., Wm. B.

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Carnegie Steel Co.
Foster Co., L. B.

Rail Grinders (See Grinders)

Rails, Relaying
Foster Co., L. B.
Zelnicker, Walter A., Supply Co. Inc.

Railway Materials
Johns-Manville, Inc.

Railway Safety Switches
Westinghouse Elec. & Mfg. Co.

Rattan
American Rattan & Reed Mfg. Co.
Brill Co., The J. G.
Electric Service Supplies Co.
St. Louis Car Co.

Registers and Fittings
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Rooke Automatic Register Co.

Reinforcement, Concrete
American Steel & Wire Co.
Carnegie Steel Co.

Relays
Condit Electrical Mfg. Co.

Remote Control Switches
Condit Electrical Mfg. Co.

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Columbia M. W. & M. I. Co.
Electric Service Supplies Co.

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Electric Service Supplies Co.

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Columbia M. W. & M. I. Co.

Resistance, Wire and Tube
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Westinghouse Elec. & Mfg. Co.

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Rheostats
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Roofing Asbestos
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Roofing, Car
Pantasote Co.

Roofs
Haskelite Mfg. Co.

Sand Boxes
Horne Mfg. Co.

Sanders, Track
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Nichols-Lintern Co.
Ohio Brass Co.
St. Louis Car Co.

Sash Fixtures, Car
Brill Co., The J. G.

Scrapers, Track (See Cleaners and Scrapers, Track)

Seating Materials
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Pantasote Co.

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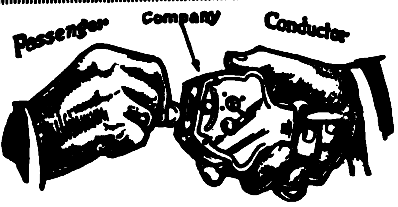

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- Brill Co., The J. G.
- St. Louis Car Co.

Second-Hand Equipment
- Archer & Baldwin
- Cleveland Armature Works
- Electric Equipment Co.
- Foster Co., H. M.
- Hyman Michaels Co.
- Karasik, Friedman & Co., Inc.
- Reading Eng. Co.
- Transit Equipt. Co.
- Zelnicker, Walter A., Supply Co., Inc.

Shades, Vestibule
- Brill Co., The J. G.

Shovels
- Allis-Chalmers Mfg. Co.
- Brill Co., The J. G.
- Hubbard & Co.

Siganls, Car Starting
- Consolidated Car Heating Co.
- Electric Service Suplies Co.
- National Pneumatic Co., Inc.
- Nichols-Lintern Co.

Signal Systems, Block
- Electric Service Supplies Co.
- Nachod Signal Co., Inc.
- U. S. Electric Signal Co.
- Wood Co., Chas. N.

Signal Systems, Highway Crossing
- Nachod Signal Co., Inc.
- U. S. Electric Signal Co.

Slack Adjusters (See Brake Adjusters)

Slag
- Carnegie Steel Co.

Sleet Wheels and Cutters
- Anderson Mfg. Co., A. & J. M.
- Columbia M. W. & M. I. Co.
- Electric Railway Equipment Co.
- More-Jones Brass & Metal Co.
- Nuttall Co., R. D.

Snow-Plows, Sweepers and Brooms
- American Rattan & Reed Mfg. Co.
- Brill Co., The J. G.
- Columbia M. W. & M. I. Co.
- Consolidated Car Fender Co.

Sockets and Receptacles
- Johns-Manville, Inc.

Solderless Connectors
- Frankel Connector Co.

Spikes
- American Steel & Wire Co.

Splicing Compounds
- Westinghouse Elec. & Mfg. Co.

Splicing Sleeves (See Clamps and Connectors)

Spray Nozzles
- Schutte & Koerting Co.

Springs, Car and Truck
- American Steel Foundries
- American Steel & Wire Co.
- Bemis Car Truck Co.
- Brill Co., The J. G.
- Fort Pitt Spring & Mfg. Co.
- Standard Steel Works Co.

Sprinklers, Track and Road
- Brill Co., The J. G.
- St. Louis Car Co.

Steel Castings
- Wharton, Jr., & Co., Wm.

Steps, Car
- American Abrasive Metals Co.
- American Mason Safety Tread Co.

Strand
- Copper Clad Steel Co.
- Roebling's Sons Co., J. A.

Stokers, Mechanical
- Babcock & Wilcox Co.
- Westinghouse Elec. & Mfg. Co.

Storage Batteries (See Batteries, Storage)

Subway Switches
- Condit Electrical Mfg. Co.

Superheaters
- Babcock & Wilcox Co.
- Power Specialty Co.

Sweepers, Snow (See Snow Plows, Sweepers and Brooms)

Switch Stands
- Ramapo Iron Works

Switches, Track (See Track Special Work)

Switchboxes
- Chicago Fuse Mfg. Co.
- Johns-Manville, Inc.

Switches and Switchboards
- Allis-Chalmers Mfg. Co.
- Anderson Mfg. Co., A. & J. M.
- Condit Electrical Mfg. Co.
- Electric Service Supplies Co.
- General Electric Co.
- Johns-Manville, Inc.
- Westinghouse Elec. & Mfg. Co.

Tampers, Tie
- Ingersoll-Rand Co.

Tapes and Cloths (See Insulating Cloth, Paper and Tape)

Telephones and Parts
- Electric Service Supplies Co.

Terminals, Cable
- Standard Underground Cable Co.

Testing, Commercial and Electrical
- Elec'l Testing Laboratories

Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)

Thermostats
- Consolidated Car Heating Co.
- Gold Car Heating & Lighting Co.
- Railway Utility Co.
- Smith Heater Co., Peter

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- Electric Service Supplies Co.

Tickets, Transfers
- Globe Ticket Co.

Tie Plates
- Cambria Steel Co.

Ties, Mechanical
- Dayton Mechanical Tie Co.

Ties and Tie Rods, Steel
- American Bridge Co.
- Barbour-Stockwell Co.
- Carnegie Steel Co.
- International Steel Tie Co.

Ties, Wood Cross (See Poles, Ties, Poles, etc.)

Tongue Switches
- Wharton, Jr., & Co., Wm.

Tool Holders
- Williams & Co., J. H.

Tool Steel
- Carnegie Steel Co.

Tools, Thread Cutting
- Williams & Co., J. H.

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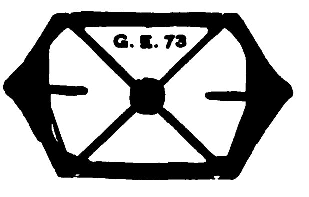

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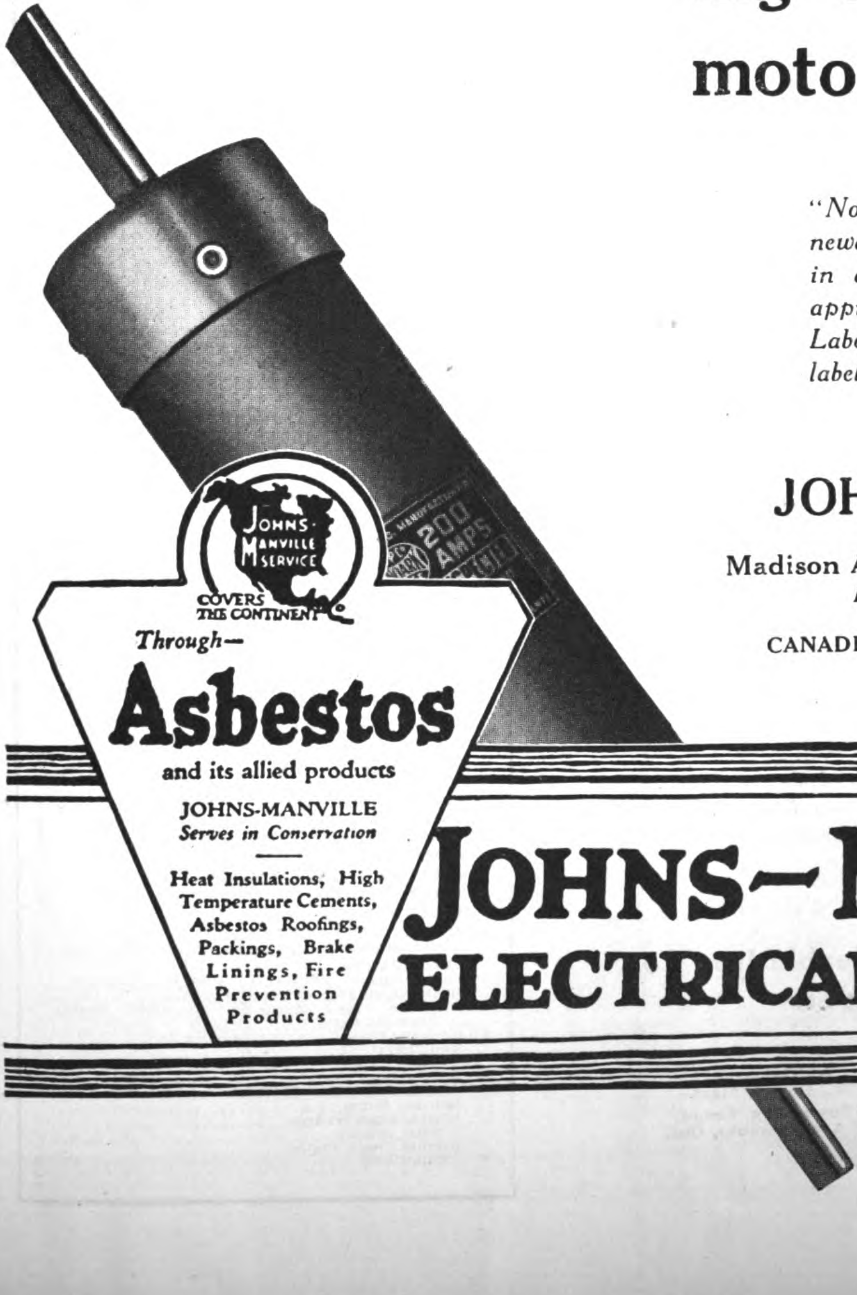

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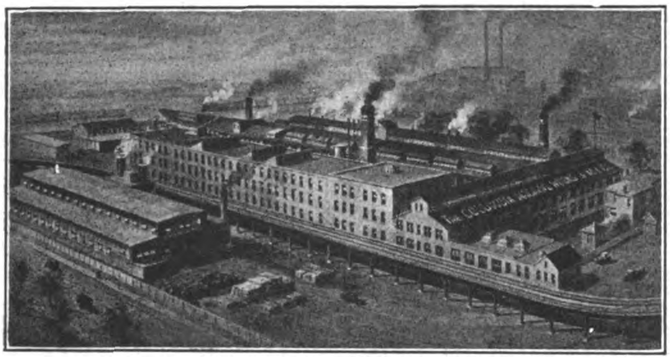

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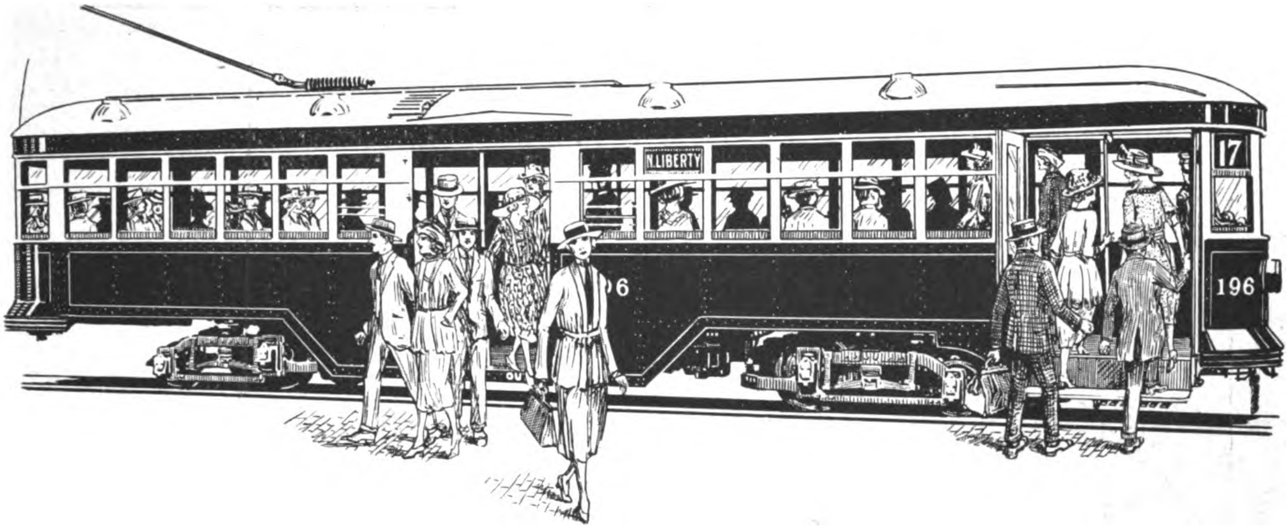

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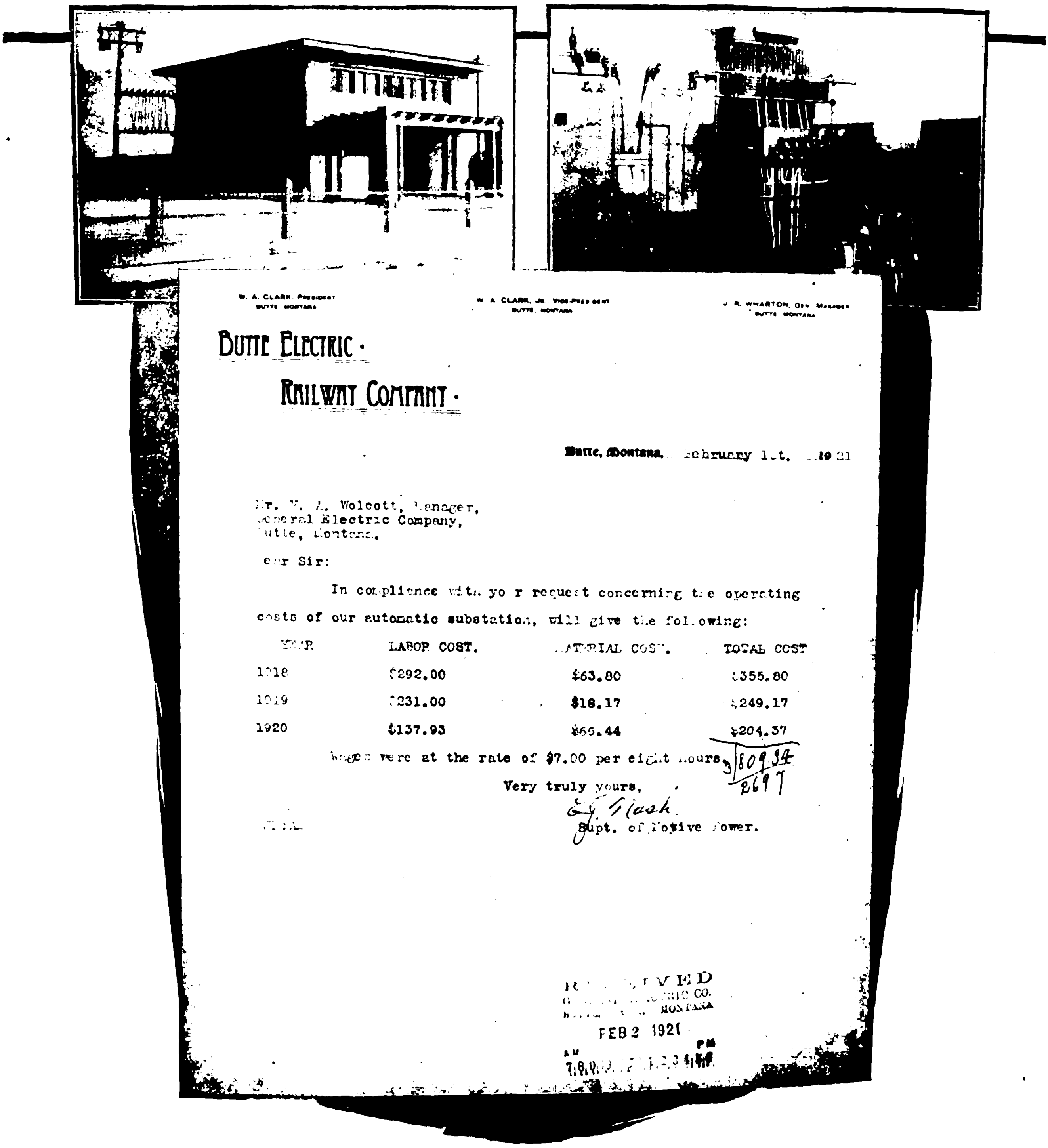

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